September 27, 2006

Mr. Karl W. Singer
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 LIMITS ON MAIN STEAM ISOLATION VALVE LEAKAGE (TAC NO. MC3813)

Dear Mr. Singer:

The Commission has issued the enclosed Amendment No. 261 to Renewed Facility Operating License No. DPR-33 for the Browns Ferry Nuclear Plant (BFN), Unit 1. This amendment is in response to your application dated July 9, 2004 (letter TVA-BFN-TS-436).

The amendment revises BFN Unit 1 Technical Specifications Surveillance Requirement 3.6.1.3.10 to increase the allowed main steam isolation valve (MSIV) leak rate limit from 11.5 standard cubic feet per hour (scfh) per valve, to 100 scfh for each individual MSIV with a combined leak rate of 150 scfh for all four main steam lines.

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/

Margaret H. Chernoff, 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. 261 to DPR-33
2. Safety Evaluation

cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 261
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 July 9, 2004, 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 to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 261, 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 from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

L. Raghavan, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the
Technical Specifications

Date of Issuance: September 27, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 261

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.

Revise the Appendix A Technical Specifications by removing the page identified below and inserting the attached page. The revised page is identified by the captioned amendment number and contains a marginal line indicating the area of change.

REMOVE	INSERT
3.6-16	3.6-16

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 261

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 July 9, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML041980222), the Tennessee Valley Authority (TVA, the licensee) submitted to the Nuclear Regulatory Commission (NRC) a request for changes to the Browns Ferry Nuclear Plant (BFN), Unit 1, Technical Specifications (TSs). The proposed changes increase the allowable leakage limit for any one of the four main steam line (MSL) penetrations from 11.5 standard cubic feet per hour (scfh) to 100 scfh, and establish a 150-scfh limit on the maximum allowable combined leakage of all four MSL penetrations.

Specifically, TS Surveillance Requirement (SR) 3.6.1.3.10 currently states:

> Verify leakage rate through each MSIV is $\leq$ 11.5 scfh when tested at $\geq$ 25 psig.

The licensee proposes to revise TS SR 3.6.1.3.10 to state:

> Verify leakage rate through each MSIV is $\leq$ 100 scfh and that the combined leakage rate for all four main steam lines is $\leq$ 150 scfh when tested at $\geq$ 25 psig.

The licensee's application also included a request for exemption from Title 10, *Code of Federal Regulations* (10 CFR), Part 50, Appendix J. The proposed exemption would allow the licensee to exclude leakage from MSL penetrations from consideration in meeting the requirement that the total leakage of Type B and Type C containment penetrations shall not exceed 60 percent of the maximum allowable containment leakage (i.e., 0.6 La). MSL penetrations are Type C containment penetrations. The request for exemption is being reviewed by the NRC staff concurrently as a separate licensing action.

The NRC staff previously approved similar changes to the MSIV leakage rate limits for BFN Units 2 and 3 by Amendment Nos. 263 and 223, respectively, dated March 14, 2000 (ADAMS Accession No. ML003693000). The radiological consequences of the increased MSIV leakage rate limits and the acceptability of the alternate leakage treatment (ALT) system for BFN Unit 1 were previously reviewed and approved by the NRC staff, as documented in the safety

evaluation for BFN Unit 1 Amendment No. 251 (Full-Scope Implementation of Alternative Source Term), dated September 27, 2004 (ADAMS Accession No. ML042730028).

2.0 EVALUATION

2.1 Background

The main steam system transports steam from the reactor vessel to the main turbines and other steam driven auxiliary equipment. Each of the four MSLs contains two quick closing main steam isolation valves (MSIVs) located in the containment penetration piping. One MSIV in each line is located inside the containment, and the other is located outside. These valves serve to rapidly isolate the primary containment MSL penetrations in the event of an MSL break accident or loss-of-coolant accident. At some boiling-water reactor (BWR) facilities, the MSLs are provided with a leakage control system (LCS) to collect and process MSIV leakage; however, BFN-1 does not have an MSIV LCS.

MSIVs, due to their size and service conditions, have a history of leakage in excess of their design criteria. On July 16, 1982, the NRC staff issued NRC Information Notice 82-23, "Main Steam Isolation Valve Leakage," which discussed the high frequency at which MSIVs were failing to meet TS leak test criteria. Because of these recurring problems with excessive leakage of MSIVs, the NRC established Generic Issue C-8, "Main Steam Line Valve Leakage Control Systems." The same year, the BWR Owners' Group (BWROG) formed an MSIV Leakage Committee to address the MSIV leakage issue. In 1986, Generic Letter 86-17, "Technical Findings Related to Generic Issue C-8; Boiling Water Reactor Main Steam Isolation Valve Leakage and Leakage Treatment Methods," was issued, and a follow-on MSIV Leakage Closure Committee was formed to further the effort. Based on the committee's work, the BWROG developed an approach for resolution of Generic Issue C-8 that proposed to remove the safety related leakage control systems on those facilities having them, and increase MSIV allowable leakage limits. The BWROG described the proposal in "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," NEDC-31858P, Revision 1, dated October 1991.

The purpose of NEDC-31858P was to define a means by which BWR licensees could demonstrate to regulators that alternate leakage treatment (ALT) leakage pathways using main steam system piping and the main condenser are capable of performing a post-accident dose mitigation function for MSIV leakage, under safe-shutdown earthquake conditions. This would provide a basis to (1) eliminate MSIV Leakage Control Systems at those facilities having them and (2) increase allowable MSIV leakage rates. The NRC staff reviewed NEDC-31858P, Revision 2, and issued its safety evaluation on March 3, 1999 (ADAMS Accession No. ML010640286), approving the report for reference in future individual plant applications. The safety evaluation concluded that licensees demonstrating certain plant-specific attributes are eligible for amendments increasing the allowable MSIV leakage rate up to 200 scfh. Licensees would have to demonstrate that the main steam piping from the outermost isolation valve up to the turbine stop valve, the bypass/drain piping to the main condenser, and the main condenser, will retain structural integrity during and following a safe-shutdown earthquake (SSE). NEDC-31858P was reissued by the BWROG as NEDC-31858P-A (ADAMS Accession No. ML993440254), dated November 22, 1999.

2.2 Technical Evaluation

2.2.1 Review of the ALT Pathway

The NRC staff previously reviewed (1) the functional design of the ALT path and capability to establish the ALT path under post-accident conditions, and (2) structural/seismic issues related to integrity of the ALT path. Details of the NRC staff's review are documented in the safety evaluation for BFN Unit 1 Amendment No. 251, dated September 27, 2004 (ADAMS Accession No. ML042730028). The NRC staff's conclusion was that there is reasonable assurance that the BFN Unit 1 MSIV ALT system is seismically adequate for the intended purpose. The NRC staff's conclusion was based on the fact that (1) the ALT pathway has been walked-down in accordance with the procedures in NEDC-31858P-A, which was approved by the NRC staff, (2) all the outliers have been either analytically resolved or physically modified, (3) the condenser was seismically analyzed subject to a design-basis earthquake (DBE) for its adequacy and its anchorages were evaluated to be adequate in accordance with information contained in NEDC-31858P-A, and (4) the turbine building is deemed, through the use of approximate calculations to be followed by performance of dynamic seismic analysis prior to the plant restart, to remain intact following a DBE. In approving Amendment No. 251, the NRC staff added license condition 2.C(15):

> The licensee is required to confirm that the conclusions made in TVA's letter dated September 17, 2004 [ADAMS Accession No. ML042730342], for the turbine building remain acceptable using seismic demand accelerations based on dynamic seismic analysis prior to the restart of Unit 1.

In approving this amendment, the NRC staff notes that the licensee must satisfy license condition 2.C(15). The basis used by the NRC staff in approving Amendment No. 251 has not changed; therefore, the staff concludes that the ALT system continues to be adequate to perform its safety function.

2.2.2 Radiological Consequences

The NRC staff previously reviewed the radiological consequences for increased MSIV leakage via the ALT path. Details of the staff's review were documented in the safety evaluation for BFN Unit 1 Amendment No. 251. The NRC staff's radiological review encompassed (1) the release pathways, (2) meteorology, and (3) control room habitability, and focused on the changes from previous NRC-accepted analyses. The NRC staff reviewed the technical analyses related to the radiological consequences of DBAs that were performed by TVA in support of Amendment No. 251, which was based on the increased MSIV leakage limits. With regard to BFN, Unit 1, the inputs used in the main steam line break accident, fuel handling accident, and control rod drop accident were bounding for Units 1, 2, and 3. The inputs used in the loss-of-coolant accident were different for Unit 1 and Units 2 and 3; a separate analysis was performed and the bounding results for Units 1, 2, and 3 were provided. Based on its review of information provided by the licensee, the NRC staff concluded that the offsite dose consequences of DBAs are within the acceptance criteria of 10 CFR Part 100, and the control room dose consequences are within the acceptance criteria of 10 CFR Part 50, Appendix A, General Design Criterion 19. The basis used by the NRC staff in approving Amendment No. 251 has not changed; therefore, the staff concludes that the offsite dose consequences of DBAs continue to be within the acceptance criteria of 10 CFR Part 100, and the control room

dose consequences are within the acceptance criteria of 10 CFR Part 50, Appendix A, General Design Criterion 19.

2.2.3 TS Bases Changes

The licensee proposed associated changes to the TS Bases. Since the proposed change summarized a required action from the TSs, the NRC staff recommended that the licensee consider revising the proposed change to the TS Bases to more closely conform to NUREG-1433, "Standard TSs, General Electric, BWR/4," Volume 2, "Bases." The issue was discussed in a telephone call on August 21, 2006, between F. Lyon (NRC) and J. McCarthy (TVA). The licensee will consider the issue when the change is processed under its TS Bases Control Program.

2.2.4 Conclusion

Based on the information provided by TVA related to increasing the allowable MSIV leakage rate at BFN Unit 1 to 100 scfh per valve, provided the combined leakage from all four MSLs is not greater than 150 scfh, the NRC staff finds reasonable assurance that the ALT will perform its safety function and that radiological consequences of DBAs at BFN, Unit 1 will be within the dose guidelines of 10 CFR Part 100 and the criteria of 10 CFR Part 50, Appendix A, General Design Criterion 19. Therefore, the proposed changes to the MSIV leakage limits are acceptable.

2.3 Summary of Commitments

In its July 9, 2004, application, the licensee made the following commitments:

1. Prior to Unit 1 restart, plant operating procedures will be revised to provide procedural requirements for the establishment of the ALT path to the condenser.

2. The Unit 1 outliers [e.g., conditions that did not conform with the seismic walkdown screening guidelines or were judged by the licensee to require further review] will be resolved prior to Unit 1 restart. This includes qualification of 1-PCV-1-147 and the addition of in-line check valves (1-CKV-1-742 and 1-CKV-1-744) for the offgas preheaters.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the NRC staff attempted to contact the Alabama State official concerning the proposed issuance of the amendment. There was no official response.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a surveillance requirement. 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 (71 FR 29680). 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.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is operation in the proposed manner, (2) such activities will be conducted in compliance with the reasonable assurance that the health and safety of the public will not be endangered by 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.

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Date: September 27, 2006

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