

September 26, 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: BROWN FERRY NUCLEAR PLANT, UNIT 1 - EXEMPTION FROM THE
REQUIREMENTS OF 10 CFR PART 50, APPENDIX J (TAC NO. MC3814)

Dear Mr. Singer:

The Commission has approved the enclosed exemption from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix J, for the Browns Ferry Nuclear Plant, Unit 1. This action is in response to your letter dated July 9, 2004, requesting for an exemption from the requirements to include main steam isolation valve leakage in the overall integrated leakage rate test measurements required by Section III.A of Appendix J, Option B, and in the sum of local leak rate test measurements required by Section III.B of Appendix J, Option B.

A copy of the exemption has been forwarded to the Office of the Federal Register for publication.

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

Enclosure: Exemption

cc w/encl: See next page

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**No Legal Objection

*Memo dated

NRR-048

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BROWNS FERRY NUCLEAR PLANT

Mr. Karl W. Singer
Tennessee Valley Authority

cc:

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

Mr. Larry S. Bryant, Vice President
Nuclear Engineering & Technical Services
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Brian O'Grady, Site Vice President
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Mr. Robert J. Beecken, Vice President
Nuclear Support
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

General Counsel
Tennessee Valley Authority
ET 11A
400 West Summit Hill Drive
Knoxville, TN 37902

Mr. John C. Fornicola, Manager
Nuclear Assurance and Licensing
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Bruce Aukland, Plant Manager
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Mr. Masoud Bajestani, Vice President
Browns Ferry Unit 1 Restart
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Mr. Robert G. Jones, General Manager
Browns Ferry Site Operations
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Mr. Larry S. Mellen
Browns Ferry Unit 1 Project Engineer
Division of Reactor Projects, Branch 6
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW.
Suite 23T85
Atlanta, GA 30303-8931

Mr. Glenn W. Morris, Manager
Corporate Nuclear Licensing
and Industry Affairs
Tennessee Valley Authority
4X Blue Ridge
1101 Market Street
Chattanooga, TN 37402-2801

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

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

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

UNITED STATES OF AMERICA
U.S. NUCLEAR REGULATORY COMMISSION
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNIT 1
DOCKET NO. 50-259
EXEMPTION

1.0 BACKGROUND

The Tennessee Valley Authority (TVA, the licensee) is the holder of Facility Operating License No. DPR-33, which authorizes operation of the Browns Ferry Nuclear Plant, Unit 1 (BFN-1). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The BFN-1 facility consists of a boiling water reactor (BWR) located in Limestone County, Alabama.

2.0 REQUEST/ACTION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(o), requires that primary reactor containments for water-cooled power reactors be subject to the requirements of Appendix J to 10 CFR Part 50. Appendix J specifies the leakage test requirements, schedules, and acceptance criteria for tests of the leak tight integrity of the primary reactor containment and systems and components which penetrate the containment. Appendix J, Option B, Section III.A requires that the overall integrated leak rate must not exceed the allowable leakage with margin, as specified in the Technical Specifications (TSs). The overall integrated leak rate, as specified in the 10 CFR Part 50, Appendix J definitions, includes the contribution

from main steam isolation valve (MSIV) leakage. By letter dated July 9, 2004, the licensee requested exemption from Option B, Section III.A, requirements to permit exclusion of MSIV leakage from the overall integrated leak rate test measurement.

Option B, Section III.B of 10 CFR Part 50, Appendix J, requires that the sum of the leakage rates of all Type B and Type C local leak rate tests be less than the performance criterion with margin, as specified in the TSs. The licensee also requests exemption from this requirement, to permit exclusion of the MSIV contribution to the sum of the Type B and Type C tests.

3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health and safety, and are consistent with the common defense and security; and (2) special circumstances are present. Section 50.12(a)(2)(ii) of 10 CFR states that special circumstances are present when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." In addition, Section 50.12(a)(2)(iii) of 10 CFR states that special circumstances are present when "Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated."

Testing in accordance with 10 CFR Part 50, Appendix J, ensures that primary containment leakage following a design basis loss-of-coolant accident will be within the allowable leakage limits specified in the TSs and assumed in the safety analyses for determining radiological consequences. For BFN-1, the containment integrated leakage rate test currently includes leakage through closed MSIVs. However, the MSIV leakage effluent has

a different pathway to the environment compared to other containment penetrations. It is not directed into the secondary containment and filtered through the standby gas treatment system as is other containment leakage. Instead, the MSIV leakage is directed through the main steam drain piping into the condenser and is released to the environment as an unfiltered ground level effluent. The licensee analyzed the MSIV leakage pathway for the increased leakage (from less than or equal to 11.5 standard cubic feet per hour (scfh) per valve to less than or equal to 100 scfh per valve, with combined leakage for all four main steam lines less than or equal to 150 scfh), and the containment leakage pathway separately in a dose consequences analysis. The calculated radiological consequences of the combined leakages were found to be within the criteria of 10 CFR Part 100 and 10 CFR Part 50, Appendix A, General Design Criterion 19. The NRC staff reviewed the licensee's analyses and found them acceptable, as described in the safety evaluation associated with Amendment No. 251, dated September 27, 2004. 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 [Agencywide Documents Access and Management System 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 these exemptions, the NRC staff notes that the licensee must satisfy license condition 2.C(15).

By separating the MSIV leakage acceptance criteria from the overall integrated leak rate test criteria, and from the Type B and C leakage sum limitation, the BFN-1 containment leakage testing program will be made more consistent with the limiting assumptions used in the associated accident consequences analyses. It will also allow additional operational flexibility by, in effect, increasing the total containment leakage rate limit while remaining within the

applicable dose consequence guidelines and requirements. The licensee's exemption request was submitted in conjunction with a proposed amendment to the TSs to increase the allowable leak rate for MSIVs, which is being evaluated by the NRC staff separately. The amendment associated with this exemption will revise TS Surveillance Requirement (SR) 3.6.1.3.10 to limit the maximum allowable MSIV leakage through each individual valve to 100 scfh and combined MSIV leakage to 150 scfh. The requested exemption from Appendix J requirements for MSIV leakage will allow BFN-1 to operate with the proposed TS increased allowable MSIV leakage rates with reduced radiological exposure to plant personnel for maintaining MSIV leakage limits. The licensee's exemption request and proposed changes to the TSs together would implement the recommendation of BWR Owners Group Topical Report NEDC-31858, "BWR Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," which was approved by the NRC staff in a safety evaluation dated March 3, 1999. Therefore, the NRC staff finds the proposed exemptions from Appendix J to separate MSIV leakage from other containment leakage to be acceptable.

Authorized by Law

This proposed exemptions would permit exclusion of MSIV leakage from the overall integrated leak rate test measurement and permit exclusion of the MSIV contribution to the sum of the Type B and Type C local leak rate tests. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50, Appendix J. The NRC staff has determined that granting the licensee's proposed exemptions will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemptions are authorized by law.

No Undue Risk to Public Health and Safety

The underlying purpose of Appendix J is to assure that containment leak tight integrity is maintained (a) as tight as reasonably achievable, and (b) sufficiently tight so as to limit effluent

release to values bounded by the analyses of radiological consequences of design-basis accidents (DBAs). The proposed changes require the use of the main steam piping and the condenser to process MSIV leakage. This additional function does not compromise the reliability of these systems. They will continue to function as intended and not be subject to a failure of a different kind than previously considered. Since no new accident precursors are created by permitting the exclusion of MSIV leakage from the overall integrated leak rate test measurement and permitting the exclusion of the MSIV contribution to the sum of the Type B and Type C local leak rate tests, the probability of postulated accidents is not increased. The allowable leak rate specified for the MSIVs is used to quantify a maximum amount of leakage assumed to bypass containment. Sufficient margin relative to the regulatory limits is maintained even when conservative assumptions and methods are utilized. Also, the proposed change does not involve changes to the structures, systems, or components which would affect the probability of an accident previously evaluated in the BFN-1 updated final safety analysis report. Thus, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety.

Consistent with Common Defense and Security

The proposed exemptions would permit exclusion of MSIV leakage from the overall integrated leak rate test measurement and permit exclusion of the MSIV contribution to the sum of the Type B and Type C local leak rate tests. This change to the operation of the plant has no relation to security issues. Therefore, the common defense and security are not impacted by these exemptions.

Special Circumstances

Section 50.12(a)(2)(ii) of 10 CFR states that special circumstances are present when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." The

NRC staff examined the licensee's rationale to support the exemption request and concluded that it would meet the underlying purpose of Appendix J, Option B, Sections III.A and III.B. The underlying purpose of Appendix J is to assure that containment leak tight integrity is maintained (a) as tight as reasonably achievable, and (b) sufficiently tight so as to limit effluent release to values bounded by the analyses of radiological consequences of DBAs. Including the MSIV leakage in the test acceptance criteria is not necessary to achieve the underlying purpose of the rule because MSIV leakage is not directed into the secondary containment. Also, TS SR 3.6.1.3.10 specifies a specific leak rate limit to assure operation of BFN-1 remains within the bounds of the DBA analysis. Therefore, the underlying purpose of the rule continues to be met.

In addition, Section 50.12(a)(2)(iii) of 10 CFR states that special circumstances are present when "Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated." The licensee's exemption request and proposed changes to the TSs together would implement the recommendation of Topical Report NEDC-31858. The special circumstances associated with MSIV leakage testing are fully described in the topical report. These circumstances include the monetary costs and personnel radiation exposure involved with maintaining MSIV leakage limits more restrictive than necessary to meet offsite dose criteria and control room habitability criteria. The exemption from Appendix J requirements for MSIV leakage rates is required so that BFN-1 can operate with the proposed TS increased allowable MSIV leakage rates. This results in reduced radiological exposure to plant personnel, greater MSIV reliability, and significant monetary benefit to TVA as a result of reduced plant outage durations.

Therefore, since the underlying purpose of 10 CFR Part 50, Appendix J, is achieved and the circumstances described in NEDC-31858 are met, the special circumstances required by

10 CFR 50.12(a)(2)(ii) and 50.12(a)(2)(iii) for the granting of an exemption from 10 CFR Part 50, Appendix J exist.

4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants TVA an exemption from the requirements of 10 CFR Part 50, Appendix J, Option B, Sections III.A and III.B with respect to MSIV leakage, for BFN-1.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (71 FR 33777).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 26th day of September 2006.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Catherine Haney, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation