November 18, 2004

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: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3, LICENSE RENEWAL APPLICATION (TAC NOS. MC1704, MC1705 AND MC1706)

Dear Mr. Singer:

By letter dated December 31, 2003, Tennessee Valley Authority (TVA) submitted an application pursuant to 10 CFR Part 54, to renew the operating licenses for the Browns Ferry Nuclear Plant, Units 1, 2, and 3, for review by the U.S. Nuclear Regulatory Commission (NRC). The NRC staff is reviewing the information contained in the license renewal application (LRA) and has identified areas where additional information is needed to complete the review. Specifically, the enclosed requests for additional information (RAIs) are related to Section 3.2 and 3.4 of the LRA.

Based on discussions with Ken Brune of your staff, a mutually agreeable date for your response to these RAIs is within 30 days of the date of this letter. If you have any questions regarding this letter or if circumstances result in your need to revise the response date, please contact me at 301-415-1478 or by e-mail at rxs2@nrc.gov.

Sincerely,
/RA/
Ram Subbaratnam, Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos.: 50-259, 50-260, and 50-296

Enclosure: As stated

cc w/encl: See next page

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BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION (RAIs)
SECTIONS 3.2 AND 3.4

Section 3.2 Engineered Safety Features Systems

RAI 3.2-1

In LRA Tables 3.2.2.1 through 3.2.2.7, carbon and low alloy steel bolting in an inside air (external) or outside air (external) environment is not identified with any aging effects requiring management. The applicant indicated that this is because BFN do not use high yield strength bolting. Discuss the specific material grading used for the bolting in each of the associated systems, and justify the basis for concluding that crack initiation/growth due to SCC is not a concern for the bolting during the period of extended operation.

RAI 3.2-2

In LRA Tables 3.2.2.1 through 3.2.2.4, 3.2.2.6, and 3.2.2.7, nickel alloy bolting and copper alloy fittings, heat exchangers, tubing, and valves in an inside air (external) environment are not identified with any aging effects requiring management. The applicant stated, ?There are no applicable aging effects for this material/environment combination. This is consistent with industry guidance." Provide a detailed discussion of the air environment involved, and justify the basis for concluding that there are no aging effects requiring management under such material/environment combinations. Provide a summary description of the stated industry guidance.

RAI 3.2-3

In LRA Table 3.2.2.1, carbon and low alloy steel valves in an treated water (internal) environment are not identified with any aging effects requiring management. The staff noted that the component, material and environment combination for this component is similar to that identified in NUREG-1801, Item V.C.1-a, which recommends a plant-specific aging management program to be evaluated for the identified aging effects. Explain why the aging effects identified in NUREG-1801, such as loss of material due to general, pitting, and crevice corrosion, are not applicable to these components.

RAI 3.2-4

In LRA Table 3.2.2.3, elastomer flexible connectors in an air/gas (internal) environment are not identified with any aging effects requiring management. The applicant stated, ?There are no applicable aging effects for this material/environment combination. This is consistent with industry guidance." Provide a detailed discussion of the air/gas (internal) environment involved, and justify the basis for concluding that there are no aging effects requiring management under such material/environment combinations. Provide a summary description of the stated industry guidance.

RAI 3.2-5

In LRA Table 3.2.2.5, aluminum alloy fittings in a treated water (internal) environment are identified as being susceptible to crack initiation/growth due to SCC and loss of material due to crevice and pitting corrosion. Explain why loss of material due to general and galvanic corrosion is not identified as a potential aging effect to be managed during the period of extended operation. Also explain how Chemistry Control Program, with association of One-Time Inspection Program, is used to manage the identified aging effects under the above components/material/environment combinations.

RAI 3.2-6

In LRA Table 3.2.2.5, polymer tubing in an air/gas (internal) or inside air (external) environment are not identified with any aging effects requiring management. The applicant stated, ?There are no applicable aging effects for this material/environment combination. This is consistent with industry guidance." Provide a detailed discussion of the air environments involved, and justify the basis for concluding that there are no aging effects requiring management under such material/environment combinations. Provide a summary description of the stated industry guidance.

Section 3.4 Steam and Power Conversion

RAI 3.4-1

In LRA Tables 3.4.2.1 through 3.4.2.7, carbon and low alloy steel bolting in an inside air (external) or outside air (external) environment is not identified with any aging effects requiring management. The applicant indicated that it is because BFN do not use high yield strength bolting. The applicant is requested to discuss the specific material grading used for the bolting in each of the systems, and justify the basis for concluding that crack initiation/growth due to SCC is not a concern for the bolting during the period of extended operation.

RAI 3.4-2

In LRA Tables 3.4.2.2, 3.4.2.3, 3.4.2.6, and 3.4.2.7, copper alloy components in an inside air (external) environment are not identified with any aging effects requiring management. The applicant stated, ?There are no applicable aging effects for this material/environment combination. This is consistent with industry guidance." Provide a detailed discussion of the air environment involved, and justify the basis for concluding that there are no aging effects requiring management under the material/environment combinations. Provide also a summary description of the stated industry guidance.

RAI 3.4-3

In LRA Tables 3.4.2.1, 3.4.2.3, 3.4.2.4, and 3.4.2.5, carbon and low alloy steel bolting in an inside air (external) environment is not identified with any aging effects requiring management. The applicant indicated that carbon and low alloy steels are not susceptible to external general corrosion when temperature is greater than 212°F. The applicant is requested to discuss the

specific temperature environment for the bolting, instead of the piping, and justify the basis for concluding that no aging effects need to be identified.

RAI 3.4-4

In LRA Table 3.4.2.3, carbon and low alloy steel components in air/gas (internal) - moist air environments are identified as being susceptible to loss of material due to crevice, galvanic, general, and pitting corrosion. One-Time Inspection Program (B.2.1.29) is credited as the only applicable AMP, in lieu of a program which involves periodic inspections. In LRA Table 3.4.2.6, carbon and low alloy steel and cast iron and cast iron alloy components in raw water (internal) environments are identified as being susceptible to loss of material due to biofouling, MIC, crevice, general, and pitting corrosion. Again, One-Time Inspection Program (B.2.1.29) is credited as the only applicable AMP. One-time inspections are appropriate where material degradation is not expected or is expected at a slow rate in environments such as dehumidified air, but may not be appropriate for moist air or raw water environments. The applicant is requested to provide justification that the One-Time Inspection Program alone, in lieu of a more appropriate periodic inspection program, should be used to manage the aging effects for the above mentioned components and material/environment combinations.

RAI 3.4-5

In LRA Tables 3.4.2.1 and 3.4.2.3, bolting made of carbon and low alloy steel, nickel alloy, and stainless steel in inside air (external) environments are identified as being susceptible to loss of bolting function due to wear. The Bolting Integrity Program is credited as the AMP. LRA Section B.2.1.16, Bolting Integrity Program, does not specifically address loss of bolting function due to wear as an aging effect to be managed by the AMP. The applicant is requested to discuss in detail how the identified aging effect will be managed by the program.

RAI 3.4-6

In LRA Table 3.4.2.2, aluminum alloy fittings and piping in a treated water (internal) environment are identified as being susceptible to crack initiation/growth due to SCC and loss of material due to crevice, galvanic, and pitting corrosion. Explain why loss of material due to general corrosion is not identified as a potential aging effect to be managed during the period of extended operation. For the portion of the condensate system that contains single phase fluid with temperatures < 200°F, explain why flow-accelerated corrosion (FAC) due to erosion is not a concern for the period of extended operation. Explain also how Chemistry Control Program, with association of One-Time Inspection Program, is used to manage the aging effects under the above identified components/material/environment combinations.

RAI 3.4-7

In LRA Table 3.4.2.2, polymer fittings in an inside air (external) or treated water (internal) environment are not identified with any aging effects. The applicant stated, ?There are no applicable aging effects for this material/environment combination. This is consistent with industry guidance." Provide a detailed discussion of the air and treated water environments involved, and justify the basis for concluding that there are no aging effects requiring management under such material/environment combinations. Provide a summary description of the stated industry guidance.

RAI 3.4-8

In LRA Table 3.4.2.2, aluminum alloy valves in a treated water (internal) environment are identified as being susceptible to crack initiation/growth due to SCC and loss of material due to crevice and pitting corrosion. Explain why loss of material due to general and galvanic corrosion is not identified as a potential aging effect to be managed during the period of extended operation. Also explain how Chemistry Control Program, with association of One-Time Inspection Program, is used to manage the aging effects under the above identified components/material/environment combinations.

RAI 3.4-9

In LRA Table 3.4.2.3, stainless steel fittings, piping, valves, and restricting orifice - RCPB in an air/gas (internal) - moist air environment are identified as being susceptible to crack initiation/growth due to SCC and loss of material due to crevice and pitting corrosion. Also, stainless steel (CASS) valves - RCPB in an air/gas (internal) - moist air environment are identified as being susceptible to change in material properties/reduction in fracture toughness due to thermal aging. One-Time Inspection Program is credited to manage the identified aging effects. One-time inspections are appropriate where material degradation is not expected or is expected at a slow rate in environments such as dehumidified air, but may not be appropriate for moist air environments. The applicant is requested to provide justification that the One-Time Inspection Program alone, in lieu of a more appropriate periodic inspection program, should be used to manage the identified aging effects for the above mentioned components and material/environment combinations.

BROWNS FERRY NUCLEAR PLANT
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