

August 23, 2004

LICENSEE: Tennessee Valley Authority

FACILITY: Browns Ferry Nuclear Plant, Units 1, 2 and 3

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE HELD ON JULY 28, 2004,
BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND THE
TENNESSEE VALLEY AUTHORITY CONCERNING BROWNS FERRY
NUCLEAR PLANT, UNITS 1, 2 AND 3, LICENSE RENEWAL APPLICATION
(TAC NOS. MC1704, MC1705 AND MC1706)

The U.S. Nuclear Regulatory Commission staff and representatives of Tennessee Valley Authority (TVA or the applicant) held a telephone conference call on July 28, 2004, to discuss questions related to Section 3.6 of the Browns Ferry Nuclear Plant (BFN) license renewal application.

The conference call was useful in clarifying the intent of the staff's questions. On the basis of the discussion, the applicant was able to understand the staff's questions. The NRC staff acknowledged the applicants discussion and indicated that the clarification was understood. No staff decisions were made during the telephone conference.

Enclosure 1 contains a listing of the D-RAIs discussed with the applicant, including a brief draft response and description on the status of the items. Enclosure 2 provides a list of the telephone conference call participants. The applicant has had an opportunity to comment on this summary.

/RA/

Yaira K. Diaz Sanabria, 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

Enclosures: As stated

cc w/encls: See next page

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BROWNS FERRY NUCLEAR, UNITS 1, 2 AND 3
LICENSE RENEWAL APPLICATION
DRAFT REQUEST FOR ADDITIONAL INFORMATION (D-RAI)
ELECTRICAL AND INSTRUMENTATION AND CONTROL SYSTEMS
SECTION 3.6

D-RAI 3.6-1. Explain the aging effects of temperature (hot spot) and moisture on the existing components including cables during the long non-operational period of Unit 1.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-1.

D-RAI 3.6-2. Discuss if any Non-Environmental Qualification (EQ) cables and connections are excluded from the scope of license renewal. If so, provide a discussion how this excluded cables that share the same conduit and tray when the in scope cables are treated.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-2.

D-RAI 3.6-3. It is not clear from the description of AMP B.2.1.3, "Inaccessible Medium Voltage Cables not subject to 10 CFR 50.49 Environmental Qualification Requirements" which cables are covered by this program. Please provide a list of cables that are covered under this program. The operating experience should address plant specific and industry operating experience regarding the water treeing or a decrease in the dielectric strength of the conductor insulation. Also, provide details (ten elements) of the program.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-3.

D-RAI 3.6-4. With regard to AMP B.2.1.40, "Bus Inspection Program," please provide the following:

- (a) Clarify what is meant by in scope portions of isolated and non-segregated phase bus associated with the unit station service transformers, main transformers, and common station service transformers. Also, provide a description on how the aging of start bus 1A and 1B and shutdown bus 1 and 2 will be managed.
- 1. Under Element 3, you have stated that "The bus enclosure will be visually inspected for foreign debris, excessive dust built up, and evidence of water intrusion." Please clarify if this inspection will cover inside of the bus enclosure for foreign debris, excessive dust built up, and evidence of water intrusion. Also, confirm that internal supports and insulators will be inspected for structural integrity and signs of cracks.

2. The acceptance criteria (Element 6) needs to be modified to include "internal supports and insulators must be free of cracks and their structural integrity is intact."
3. In operating experience, address plant specific and industry operating experience of the bus failures.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-4.

D-RAI 3.6-5. In LRA Section 3.6.2.3.1, you have concluded that no AMP is required for fuse holders. However, please address the following:

1. On page 3.6-6, it is stated that fuse holders are protected by their location within a controlled environment. Define controlled environment.
2. Fatigue may be caused by frequent cycling of fuses when subject to significant loading which would cause the clips to expand and contract, and to experience fatigue failure. Discuss why this is not a concern.
3. Wear/fatigue aging mechanism is caused due to repeatedly pulling the fuses to de-energize the circuits. Discuss measures in place to restrict the pulling of the fuses except for corrective maintenance and/or trouble shooting efforts.
4. Describe the actual condition of the fuse holders. This can be done by performing an inspection only. Please perform a visual inspection of the fuse holders and provide your findings.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-5.

D-RAI 3.6-6. Provide a list of TLAA specific for EQ as required by 10 CFR 54.21(c)(1).

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-6.

D-RAI 3.6-7. Section 4.4 of the LRA identified Environmental Qualification of Electric Equipment as a TLAA requiring an evaluation by 10 CFR 54.21(c)(1). The provisions of 10 CFR 50, Appendix A, General Design Criteria (GDC) 4 require that all equipment related to safety be designed to accommodate the environmental effects of postulated accidents. Similarly, NRC SRP 3.11 (NUREG-0800) applies equally to mechanical and electrical equipment. For mechanical equipment in the LRA that are required to be evaluated as a EQ TLAA, provide a discussion on the materials that are sensitive to environmental effects (e.g., seals, gaskets, lubricants, fluids for hydraulic systems, diaphragms, and wear cycle aging from lubricant deterioration) and the aging analyses that will be or have been conducted to satisfy the requirements of 10 CFR 54.21(c)(1) for the period of extended operation.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-7.

D-RAI 3.6-8 Table 3.6.2.1 on Page 3.6-17, aging management program is identified as none for various electrical equipment subject to 10 CFR 50.49 EQ requirements. Whereas an AMP, "Environmental Qualification Program of electrical components," is identified throughout the document. Clarify this difference.

Discussion: This D-RAI was discussed during the Aging Management Program and Reviews audit during the week of July 19-23, 2004, therefore D-RAI 3.6-8 will be deleted from this set of questions and it will be addressed by the audit team.

D-RAI 3.6-9 Will the current requirements of 10 CFR 50.49 be applied for qualification of the new components in Unit 1?

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-9.

D-RAI 3.6-10 Accessible Non-EQ cables and connections inspection program (B.2.1.1) which is consistent with GALL XI.E1 will manage the aging effects so that the cables will perform their intended functions for the extended period of operation. Power uprate at BFN may change the plant design environment. Discuss why the above mentioned program is applicable to BFN.

Discussion: During the call the staff discussed an additional concern related to fire retardant cable coating (flamastic) that will be reflected as part of the question. The applicant indicated that the question is clear. This D-RAI will be sent as RAI 3.6-10 and will be worded as follow:

Accessible Non-EQ cables and connections inspection program (B.2.1.1) which is consistent with GALL XI.E1 will manage the aging effects so that the cables will perform their intended functions for the extended period of operation. Power uprate at BFN may change the plant design environment. Additionally, fire retardant cable coating (flamastic) has been applied to unqualified cables. Provide a discussion why the above mentioned program is applicable to BFN.

D-RAI 3.6-11 On Page 3.6-13, you have stated that to prevent formation of aluminum oxide on bolted connection surface, the connections have a silver plating and are covered with grease to prevent air from contacting the connection surface. Discuss the grease replacement program including frequency.

Additionally, torque relaxation for bolted connections is a concern for switchyard bus connections. An electrical connection must be designed to remain tight and maintain good conductivity through a large temperature range. Meeting this design requirement is difficult if the material specified for the bolt and the conductor are different and have different rates of thermal expansion. For example, copper or aluminum bus materials expand faster than most bolting materials. If thermal stress is added to stresses inherent at assembly, the joint members or fasteners can yield. If plastic deformation occurs during thermal

loading (i.e., heatup) when the connection cools, the joint will be loose. Provide a discussion why torque relaxation for bolted connection is not a concern for BFN.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-11.

D-RAI 3.6-12 Torque relaxation for bolted connections is a concern for transmission conductors connections. An electrical connection must be designed to remain tight and maintained good conductivity through a large temperature range. Meeting this design requirement is difficult if the material specified for the bolt and the conductor are different and have different rates of thermal expansion. For example, aluminum conductor material expands faster than most bolting materials. If thermal stress is added to stresses inherent at assembly, the joint members or fasteners can yield. If plastic deformation occurs during thermal loading (i.e., heatup) when the connection cools, the joint will be loose. Provide a discussion why torque relaxation for bolted connection is not a concern for BFN.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a RAI 3.6-12.

LIST OF PARTICIPANTS FOR TELEPHONE CONFERENCE

JULY 28, 2004

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