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NUCLEAR REGULATORY COMMISSION
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September 16, 2004

MEMORANDUM TO: P.T. Kuo, Program Director
License Renewal and Environmental Impacts Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
/RA/

FROM: Dale F. Thatcher, Section Chief
Quality and Maintenance Section
Plant Support Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

SUBJECT: AUDIT TRIP REPORT REGARDING THE TENNESSEE VALLEY
AUTHORITY LICENSE RENEWAL APPLICATION FOR THE BROWNS
FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3, DATED DECEMBER 31,
2003

Plant Name: Browns Ferry Nuclear Plant, Units 1, 2, and 3
Utility Name: Tennessee Valley Authority
Docket No.(s): 50-259 (DPR-33)
50-260 (DPR-52)
50-296 (DPR-68)

TAC No.(s): MC1704
MC1705
MC1706

Review Branch: Plant Support Branch (IPSB)
Review Status: Pending resolution of Requests for Additional Information (RAIs)

During June 7-10, 2004, the IPSB performed an audit of the Tennessee Valley Authority (the applicant) license renewal scoping and screening methodology developed to support the Browns Ferry Nuclear Plant license renewal application (LRA), dated December 31, 2003. The focus of the staff's audit was evaluation of the applicant's administrative controls governing implementation of the LRA scoping and screening methodology and review of the technical basis for selected scoping and screening results for various plant systems, structures, and components. The audit team also reviewed quality attributes for aging management programs. A trip report containing a summary of the audit results is attached.

Should you require additional information, please contact Kamal Naidu, of my staff, at 415-2980.

Attachment: As stated

CONTACT: KAMALAKAR NAIDU, NRR/DIPM/IPSB
301-415-2981

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DATE	9/16/04	9/16/04	

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**Trip Report Regarding the
Tennessee Valley Authority
License Renewal Application (LRA) for the
Browns Ferry Nuclear Plant, Units 1, 2 and 3, dated December 31, 2003**

I. Introduction

During June 7-10, 2004, Kamalakar Naidu, Greg Galletti, Frank Talbot, and Billy Rogers, Plant Support Branch (IPSB) staff, and Caudle Julian, Inspector, Region II, audited the Tennessee Valley Authority (the applicant) license renewal scoping and screening methodology developed to support the Browns Ferry nuclear plant (BFN), Units 1, 2 and 3, license renewal application (LRA). The audit was performed at the Tennessee Valley Authority offices in Chattanooga, Tennessee. The focus of the staff's audit was evaluation of the applicant's administrative controls governing implementation of the LRA scoping and screening methodology and review of the technical basis for selected scoping and screening results for various plant systems, structures, and components. The audit team also reviewed quality attributes for aging management programs, training for license renewal project personnel, quality controls applied to the LRA development process, and the applicant's plans for long term implementation of license renewal commitments.

II. Background

Title 10 of the *Code of Federal Regulations*, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," Section 54.21, "Contents of Application — Technical Information," requires that each application for license renewal contain an integrated plant assessment (IPA). Furthermore, the IPA must list and identify those structures and components that are subject to an aging management review (AMR) from the systems, structures, and components (SSCs) that are within the scope of license renewal. 10 CFR 54.4(a) identifies the plant SSCs within the scope of license renewal. Structures and components within the scope of license renewal are screened to determine if they are long-lived, passive equipment that is subject to an aging management review in accordance with 10 CFR 54.21(a)(1).

III. Scoping Methodology

The scoping and screening evaluations for the BFN LRA were performed by the applicant's license renewal project personnel. The audit team conducted detailed discussions with the applicant's license renewal project management personnel and reviewed documentation pertinent to the scoping process. The audit team assessed if the scoping methodology outlined in the LRA and implementation procedures was appropriately implemented and if the scoping results were consistent with CLB requirements. The audit team noted that in the LRA, the applicant identified differences between the current licensing basis (CLB) for Unit 1 and the CLB for Units 2 and 3, and documented them in Appendix F to the LRA. The applicant expects to resolve the differences between CLBs before the restart of Unit 1 from its current outage such that the CLB for Unit 1 will be consistent with Units 2 and 3. The audit team reviewed a sample of system scoping results for the RHR/ Cooling Water (Ultimate Heat Sink) system to verify if the scoping and screening methodologies were implemented in accordance with those described in the LRA.

In general, the team determined that the applicant's overall approach to the license renewal SSC scoping appeared to be adequate. However, the audit team identified several issues where additional information will be required to complete the LRA review. These issues relate to the applicant's methodology for performing license renewal scoping of safety-related and nonsafety-related SSCs pursuant to the requirements of 10 CFR 54.4(a)(2) and application of the 10 CFR Part 50, Appendix B Quality Assurance program to aspects of the AMP credited for license renewal. Specific questions involved:

- * definition of the safety-related (SR) classification that was used to develop the list of SSCs for the license renewal scoping and screening process,
- * the criteria used to determine how the integrity of the in-scope piping is preserved at locations where it transitions to not in-scope NSR piping if age-related degradation failures occur,
- * consideration of deleterious effects of spray and wetting on safety-related SSCs resulting from the age-related failures of nonsafety-related equipment,
- * bases for BFN conclusions that long-term exposure conditions are unlikely to occur for certain in-scope SSCs,
- * description of the aging management program quality attributes in Appendix A, "Final Safety Analysis Report Supplement."

The staff will complete the evaluation of the applicant's scoping methodology pending resolution of these issues.

IV. Screening Methodology

The audit team reviewed the methodology used by the applicant to determine if mechanical, structural, and electrical components within the scope of license renewal would be subject to further aging management review.

In Section 2.1.5, "Screening Methodology," of the LRA, the applicant describes the process used to evaluate the list of in-scope systems and structures to identify those that are subject to an aging management review (AMR). The process is consistent with the guidance provided in Table 2.1-3 of NUREG-1800. Additionally, the applicant provided the staff with a detailed discussion of the processes used for screening components in each discipline (i.e. mechanical, structural, and electrical) and provided technical documentation on component screening results. To screen the mechanical components, the applicant evaluated the SSCs identified on the license renewal boundary drawings (LRBD) to identify components in each system that are passive and long lived and therefore subject to an AMR in accordance with 10 CFR 54.21. The applicant also used the results of the LRBD review to identify active components and consumables that are short-lived components and not subject to an AMR. In addition, the applicant used the System Scoping Results form, B44-040105, to identify the component screening results for each system that are passive and long lived and subject to an AMR in accordance with 10 CFR 54.21.

In Section 2.1.7.9, "Evaluation of Consumables," of the LRA, the applicant stated consumables were divided into four categories for the purpose of license renewal: (a) packing, gaskets, component seals, and O-rings; (b) structural sealants (c) oil, grease, and component filters; and

(d) system filters, fire extinguishers, fire hoses and airpicks. Of these four categories, the applicant selected the group (b) items for the AMR, and provided acceptable explanation for deleting systems in the other groups from the AMR because they are short-lived components and are replaced at regular intervals.

To screen the electrical components, the applicant evaluated the Electrical I&C (EIC) components (exception the SBO off-site power restoration flow path) using a "spaces" approach. The "spaces" approach identifies the EIC commodity groups that are installed in the plant and the limiting environmental conditions for each group. The "spaces" approach then determines if any area environment is more severe than the limiting environment for the commodity group. If the area environment is more severe than a commodity group's limit, and if a component in the commodity group is actually located in the area, an AMR is required for that commodity group. EIC component types used plant-wide were identified regardless of the plant system they were in from the plant controlled computer database (Enterprise Maintenance Planning and Control [EMPAC]). These component types were assembled into commodity groups such as breakers, switches, and cables using the NEI 95-10, Appendix B list. The EMPAC database has a fine division of component titles based on component performance characteristics, so "sub-commodity" groups were formed to separate components into specific groups with common applications or materials. The applicant compiled a detailed list by commodity and sub-commodity of all electrical components installed in the plant and applied the criterion 10 CFR 54.21(a)(1)(i) to the EIC components on this list to screen component commodity groups that perform their intended functions without moving parts or without a change in configuration or properties, referred to as "passive" components.

In-scope structures and structural components (e.g. cable trays, pipe supports) were screened and classified as passive because they typically perform their functions without moving parts and without a change in configuration or properties. During the screening process, the applicant evaluated if any of the structural components had an elastomer seal which had to be replaced within a specified time period. If it was determined that the elastomer had a limited life, and required to be replaced periodically, the structural component was excluded from the AMR.

The audit team determined that the screening methodology was consistent with the requirements of the Rule, and that the screening methodology will identify SCs that meet the criteria of 10 CFR 54.21(a)(1).

V. Aging Management Program Quality Assurance Attributes

The audit team evaluated the quality attributes of the applicant's Aging Management Program (AMP) activities described in Appendix B, "Aging Management Programs and Activities," of the LRA. Guidance for the staff review of this area is contained in NUREG-1800, Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)." As described in Branch Technical Position IQMB-1, the AMP quality attributes for safety-related components and structures are adequately addressed by the Quality Assurance requirements of 10 CFR 50, Appendix B.

For nonsafety-related structures and components subject to an AMR, the applicant has the option to expand the scope of its 10 CFR Part 50 Appendix B program to include nonsafety-related structures and components to address corrective actions, confirmation processes, and administrative controls for aging management during the period of extended operation. Based on the staff's evaluation, the quality attributes (corrective action, confirmation process, and administrative controls) described in Section B.1.3, "Quality assurance and Administrative

Controls,” are generally consistent with Branch Technical Position IQMB-1. However, the team determined that the applicant has not described the AMP quality attributes in Appendix A, “Updated Final Safety Analysis Report Supplement.” Consistent with Branch Technical Position IQMB-1, applicant should either document a commitment to expand the scope of its 10 CFR Part 50 Appendix B program to include nonsafety-related structures and components subject to an AMP to address the AMP quality attributes during the period of extended operation or propose an alternative means to address this issue. The staff intends to issue an RAI in order to clarify the applicant’s commitments related to addressing the quality attributes of AMPs applicable to nonsafety-related structures and components subject to aging management.

VI Quality Assurance Controls Applied to LRA Development

The audit team reviewed the quality assurance controls used by the applicant to verify if they provided reasonable confidence that the LRA scoping and screening methodologies were adequately implemented. The applicant chose not to credit the existing 10 CFR 50, Appendix B quality assurance program for the development of the LRA . However, the applicant controlled the following LRA activities during the LRA development:

- Implementation of the scoping and screening methodology was governed by written procedures and guidelines.
- All final in-scope and screening information was developed by a lead technical staff member and independently reviewed by an additional technical staff member prior to being reviewed and approved by the program manager.
- The applicant developed a formal database for documenting license renewal information identified during in-scope and screening evaluations. This database was controlled in accordance with written instructions, and access to it was strictly controlled.
- The LRA was reviewed and approved by an independent expert committee comprised of experienced members of the TVA corporate engineering staff and BFN personnel.
- The applicant conducted two Program Peer Reviews and one Self Assessment of the LRA activities to validate the implementation process and the technical accuracy of the application.
- The applicant instituted a training program which required all the participants in LRA activities to attend training on the use of procedures, guidance documents, use of computer programs and drawings, and be certified to perform LRA activities.

The audit team concluded that these quality assurance controls provided assurance that LRA development activities were performed consistently with the LRA descriptions.

VII Training for License Renewal Project Personnel

The audit team reviewed the applicant’s implemented training process to ensure the guidelines and methodology for the scoping and screening activities would be performed in a consistent and appropriate manner. The applicant’s LRA team consisted of several engineers and contractors who had gained previous license renewal experience working on the Hatch LRA. The purpose of the training was to provide a framework for ensuring that the staff assigned to the technical portion

of the BFN license renewal application acquired a fundamental level of knowledge of the license renewal process and regulatory requirements. BFN used Procedure NEDP-7, Engineering Support Personnel Training, Revision 12, dated January 29, 2004, to impart training to all the personnel involved in the LRA activities. Some of the other documents which were used in the training were: NEDP-7, Qualifications Guides (QGs), Task-Specific Quality Guides License Renewal Program, NEDP-21, Technical Evaluation for License Renewal, the Code of Federal Regulations, Requirements for Renewal of Operating Requirements for Nuclear Power Plants, and Nuclear Energy Institute (NEI) 95-10, Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule.

The audit team reviewed the completed qualification and training records of several of the applicant's license renewal staff, including both experienced and non-experienced members, that performed in-scope and screening activities. The audit team did not identify any adverse findings.

Additionally, based on discussions with the applicant's license renewal personnel during the audit, the team verified that the applicant's license renewal staff were knowledgeable on the license renewal process requirements and the specific technical issues within their areas of responsibility. The audit team found that the applicant's license renewal training records were considered quality related records and that these records were accurate, comprehensive and complete.

Conclusions

The results from the scoping and screening audit indicate that the applicant considered the information in the CLB for Units 2 and 3, in developing the scoping and screening methodology. For Unit 1, the staff will review the information when it is submitted after it restarts. The CLB documentation review methodology was capable of identifying the intended functions of the SSCs in a manner consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21. Pending review of information to address RA2-1.1, the applicant considered all relevant information during the preparation of the scoping and

VIII. Exit Meeting

A public exit meeting scheduled for June 11, 2004 to discuss the results of the scoping and screening methodology audit was canceled due to a Federal Holiday declaration. The public exit meeting has been rescheduled for the week of August 23, 2004.

IX. Documents Reviewed

- 1) O-TI-346 , "Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting
- 2) O-TI-455 "Mechanical Technical evaluations For License Renewal," Revision 1,
- 3) O-TI-456 "Electrical Technical Evaluations For License Renewal,"
- 4) O-TI-457 "Civil Technical Evaluations For License Renewal,"
- 5) O-TI- 458 "License Renewal Time Limited Aging Analyses," Revision 1,
- 6) NEDP-21 "Technical Evaluations for License Renewal," Rev. 2,
- 7) NEDP-4 "Q-list and UNID Control," Revision 7,
- 8) NEDP-5_ "Design Document Reviews"
- 9) NEDP-7, Rev. 12 , "Engineering Support Personnel Training,"
- 10) SPP-2.1, Rev. 11, "Administration of Standard Programs and Programs & Processes" (SPPs);
- 11) SPP-3.1, "Corrective action Program," Rev. 6,
- 12) SPP-9.6, "Master Equipment List," (MEL) Rev. 6,

X. Personnel Contacted During Methodology Audit

Tennessee Valley Authority

* + G. M. Adkins	License Renewal Manager
* R. Alexander	License Renewal Engineer
T. Aloney	License Renewal Engineer
* + D. Arp	I&C/Electrical Principal
+ K. Brune	Mechanical Engineering Principal
+ B. Buch	I&C/Electrical Engineer
C. G. Creamer	BFN Project Design Manager
+ J. W. Davenport	License Renewal Engineer
* + R. Jansen	Civil Engineering Principal
* + R. Jennings	Scoping/Screening Specialist
+ T. Knuett	Licensing Project Management
* M. Lorek	Licensing Project Manager
* + V. Smith	Scoping/Screening Engineer

+ Denotes those who attended the entrance meeting on June 8, 2004

* Denotes those who attended the exit meeting on June 10, 2004