

April 14, 2004

Mr. Jeff Forbes  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE  
ARKANSAS NUCLEAR ONE, UNIT 2, LICENSE RENEWAL APPLICATION  
(TAC NO. MB8402)

Dear Mr. Forbes:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing a license renewal application (LRA) submitted by Entergy Operators Inc. (Entergy or the applicant) dated October 14, 2003 for the renewal of the operating licenses for Arkansas Nuclear One, Unit 2, pursuant to Title 10 *Code of Federal Regulations* Part 54 (10 CFR Part 54). The NRC staff has identified, in the enclosure, areas where additional information is needed to complete the review. Specifically, the enclosed requests for additional information (RAIs) are from Section 2.4, Scoping and Screening Results: Structures and Section 3.5, Structures and Component Supports. These RAIs have been discussed with your staff.

Your responses to these RAI's are requested within 30 days of receipt of this letter. If you have any questions, please contact me at (301) 415-1124 or e-mail [gxs@nrc.gov](mailto:gxs@nrc.gov).

Sincerely,

**/RA/**

Gregory F. Suber, Project Manager  
License Renewal Section A  
License Renewal and Environmental Impacts Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No.: 50-368

Enclosure: As stated

cc w/encl: See next page

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**REQUEST FOR ADDITIONAL INFORMATION OF SECTION 2.4,  
SCOPING AND SCREENING RESULTS: STRUCTURES, AND  
SECTION 3.5, STRUCTURES AND COMPONENT SUPPORTS, FOR  
ARKANSAS NUCLEAR ONE - UNIT 2 LICENSE RENEWAL  
APPLICATION (TAC NO. MB8402)**

**SECTION 2.4, SCOPING AND SCREENING RESULTS: STRUCTURES**

RAI 2.4- 1

- (a) LRA Table 2.2-4 identifies structures that are not within the scope of license renewal. It is not obvious to the staff that all of the listed structures serve no intended function. Please provide a description of the discharge canal and the miscellaneous tank foundations, and the technical basis for the determination that they are not within the scope of license renewal.
- (b) Verify that seismic II/I considerations are not applicable to any of the structures listed in LRA Table 2.2-4 (e.g., cooling tower).
- (c) While the tendon access gallery is not in scope, there is significant industry operating experience related to flooding and corrosive environments in the tendon access gallery that have contributed to degradation of the tendon anchorage components and surrounding concrete. Management of the condition of the tendon access gallery is a preventive step to minimize aging effects for the prestressing system. The applicant is requested to submit its plant-specific operating/aging experience related to: (1) flooding and corrosive environments in the tendon access gallery, and (2) degradation of the prestressing system components (both steel and concrete) in the tendon access gallery, and based on the ANO-2 specific tendon gallery operating/aging experience, discuss ANO-2's basis for not including the tendon gallery structure within the AMR scope pursuant to 10 CFR 54.4(a)(2).

RAI 2.4- 2

Based on its review of LRA Sections 2.1, 2.2, 2.3, 2.4, and 2.5, the staff identified a number of scoping and screening issues that require clarification and additional information. It is not clear to the staff how the applicant has addressed the following commodities in its scoping and screening evaluation: cable trays, conduit, instrument lines, TubeTrac (if applicable), thermal insulation on piping and/or structures that performs an intended function. The applicant is requested to (1) specifically describe the treatment of each of these commodities in its scoping and screening evaluation; (2) identify the specific table and row in LRA Section 2.3, 2.4, or 2.5 that includes each commodity; and (3) identify the location in LRA Section 3 that contains the AMR for each commodity.

RAI 2.4-3

Please clarify the complete scope of load handling systems included in the ANO-2 LR scope. LRA Subsections 2.4.1, 2.4.2, 2.4.3 and 2.4.4 all make reference to one or more components of various load handling systems. In addition, LRA Section 2.1.1.2.2 states, "The overheadhandling systems, whose structural failure could result in damage to any system that

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could prevent the accomplishment of a safety function, meet the criteria of 10 CFR 54.4(a)(2) and are within the scope of license renewal.” The applicant is requested to (1) provide a listing of all load handling systems in the LR scope; (2) define the associated intended function; (3) identify the specific components that are subject to an AMR, for each in-scope load handling system; (4) identify the specific row in Table 2.4-1, 2.4-2, 2.4-3, or 2.4-4 that includes each identified component; and (5) identify the location in LRA Section 3 that contains the AMR for each component.

#### RAI 2.4-4

Please clarify the complete scope of liquid storage tanks and tank foundations/supports included in the ANO-2 LR scope. UFSAR Tables 3.6-25, 3.6-26, and 3.6-27 list liquid storage tanks located outside buildings, inside containment, and in the auxiliary building, respectively. It is not clear to the staff (1) whether all the listed seismic Category I tanks and their foundations/supports are included in the LR scope; and (2) whether any of the seismic Category II tanks and/or their foundations/supports need to be included in the LR scope due to seismic III/I considerations. Furthermore, the foundations for tanks T-41B and T-25 are identified as structures within the scope of LR in LRA Table 2.2-3, but these tanks are not listed in the UFSAR tables.

Therefore, the applicant is requested to: (1) provide a list of all liquid storage tanks and tank foundations/supports included in the LR scope; (2) define the associated intended function(s); (3) provide the technical basis for exclusion of any tanks (and their foundations/supports) that are listed in the UFSAR tables; (4) identify the specific table and row in LRA Section 2.3 or 2.4 that includes each in-scope liquid storage tank and tank foundation/support; and (5) identify the location in LRA Section 3 that contains the AMR for each tank and tank foundation/support.

#### RAI 2.4-5

Based on review of ANO-2 LRA Section 2.4.3, the referenced UFSAR Section 9.2.5, and the ANO-1 LRA, the staff requests additional information before it can conclude that all the necessary elements of the “ultimate heat sink” for ANO-2 have been included in the LR scope.

- (a) From LRA Section 2.4.3, it appears that only the water in the emergency cooling pond and the intake canal are needed for safe shutdown of ANO-2. However, for ANO-1, the discharge canal was also included as part of the “ultimate heat sink”. The applicant is requested to explain this apparent discrepancy.
- (b) UFSAR Section 9.2.5.2.1 and (to a lesser extent) ANO-2 LRA Section 2.4.3 describe various components of the ECP, such as the pipe inlet and outlet structures, the 100 foot long weir, and the ECP spillway. It is not evident to the staff which components described in UFSAR Section 9.2.5.2.1 are essential to the “ultimate heat sink” function and are included within the LR scope. The applicant is requested to: (1) identify all components essential to the “ultimate heat sink” function and included in the LR scope; (2) provide the technical basis for exclusion from the LR scope of any components described in UFSAR Section 9.2.5.2.1; (3) identify the specific row in LRA Table 2.4-3 that includes each in-scope component; and (4) identify the location in LRA Section 3 that contains the AMR for each component.

RAI 2.4-6

(a) UFSAR Tables 3.7-12, 3.7-13, and 3.7-14 list concrete block walls that appear to serve intended functions, as defined by 10 CFR 54.4(a). The applicant is requested to (1) verify that all of the listed walls are within the LR scope; (2) if not, then provide the technical basis for any exclusions; (3) identify any additional block walls, not listed in the tables, that are included in the LR scope; and (4) explain the statement “No Access For xx-Bxx” in UFSAR Table 3.7-14 under “Remarks.”

(b) UFSAR Table 3.8-1 lists “Flued Head Penetrations” for the Containment. The applicant is requested to: (1) verify that all of the listed penetrations are within the LR scope; and (2) if not, then provide the technical basis for any exclusions.

RAI 2.4-7

LRA Section 2.4.2 covers the very broad structural category “Auxiliary Building, Turbine Building and Yard Structures”. LRA Section 2.4.2 describes the in-scope structures and structural components under both “Description” and “Evaluation Boundaries;” and then refers to LRA Table 2.4-2 for “Components Subject to AMR.” The staff cannot clearly define the specific scope of structures and structural components addressed in LRA Section 2.4.2 and cannot correlate which in-scope structures and structural components are subject to AMR.

Consequently, the applicant is requested to provide the following additional information:

- (a) A complete and concise list of all the structures and structural components that are included in LRA Section 2.4.2;
- (b) For each listed structure and structural component, identify the intended function(s);
- (c) For each listed structure and structural component, identify whether it is subject to AMR; and
- (d) If only part or none of the structure or structural component is subject to AMR, then provide the technical basis for the determination.

RAI 2.4-8

Section 2.4 of the LRA does not describe the cable feed-through assembly, which is part of containment electrical penetrations. This assembly serves a pressure boundary intended function. Therefore, the applicant is requested to clarify whether the cable feed-through assembly is in scope or not. If it is in scope, identify the applicable table number and component name in LRA Section 2.4 and the AMR table number and component name in LRA Section 3.5. If it is not in scope, provide the justification for its exclusion.

## SECTION 3.5, STRUCTURES AND COMPONENT SUPPORTS

### RAI 3.5-1

In discussing Item Number 3.5.1-3 (Table 3.5.1) of the LRA, the applicant asserts that the ANO-2 plant specific containment ISI program and containment leak rate testing will monitor loss of material due to corrosion of penetration bellows. NUREG-1801 under item A3.1 (Page II A3.6) recommends further evaluation regarding the stress corrosion cracking of containment bellows. The applicant is requested to provide additional information regarding the containment pressure boundary bellows at ANO-2, relevant operating experience, and method(s) used to detect their age related degradation. Note: In many cases, VT-3 examination of IWE, and Type B, Appendix J testing cannot detect such aging effects (See NRC Info Notice 92-20).

### RAI 3.5-2

For seals and gaskets related to containment penetrations, In Item Number 3.5.1-6 of the LRA, containment leak rate testing has been identified as the applicable AMP. For equipment hatches and air-locks at ANO-2, the staff agrees with the applicant's assertion that the leak rate testing program will monitor aging degradation of seals and gaskets, as they are leak rate tested after each opening (at least once every 24 months). For other penetrations with seals and gaskets, the applicant is requested to provide information regarding the adequacy of Type B leak rate testing frequency to monitor aging degradation of seals and gaskets at ANO-2.

### RAI 3.5-3

In discussion of Item 3.5.12 in Section 3.5.2.2.4, the applicant notes that the moisture barrier is monitored under IWE for aging degradation, and since the conditions in NUREG-1801 are met for inaccessible areas (i.e. liner plate), loss of material due to corrosion is insignificant. The industry experience indicates that the moisture barrier degrades with time, and any moisture accumulation in the degraded barrier corrodes the steel liner. The applicant is requested to provide information regarding the operating experience related to the degradation of moisture barrier and the containment liner plate at ANO-2. Please include a discussion of acceptable liner plate corrosion before the liner plate is reinstated to its nominal thickness.

### RAI 3.5-4

For structural items inside the ANO-2 containment, e.g. primary and secondary shield walls, reactor missile shields and reactor vessel foundation, in Table 3.5.2, the applicant refers to Notes I, and 501 to indicate that the temperatures around these components are within the NUREG-1801 threshold, and therefore, the aging effects, i.e., reduction in concrete strength and modulus of elasticity are not applicable (also discussed, in general, in Section 3.5.2.2.1.3 of the LRA). In this context, the applicant is requested to provide the following information:

- (a) The method(s) of monitoring temperatures within the primary shield wall concrete, and around the reactor vessel, and in the reactor cavity;
- (b) If the primary shield wall concrete is kept below the threshold temperature (i.e. 150° F) by means of air cooling, provide the operating experience related to the performance of the cooling system; and

- (c) The results of the latest inspection of these components, in terms of cracking, spalling, and condition of reactor vessel support structures, etc.

RAI 3.5-5

LRA section 3.5.2.2.1.1 states that the below-grade environment is not aggressive (pH>5.5, chlorides<500 ppm, and sulfates<1,500 ppm). The applicant is requested to provide the values of pH, chlorides, and sulfates at the plant site and when they were obtained. In III A7.1-e, GALL recommends periodic monitoring of below grade water chemistry for non-aggressive environments. Since the applicant has made no commitment to periodically monitor the groundwater, the applicant is requested to submit its method for assuring the continuing verification of the non-aggressiveness of the below-grade environment.

RAI 3.5-6

Items 3.5.1-22 of Table 3.5.1 indicates that the applicant intends to use structures monitoring program to manage the aging effect for Group 6 structures instead of using GALL Chapter XI.S7, "Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with nuclear Power Plants" or the FERC/US Army Corp of Engineers dam inspections and maintenance. The applicant is requested to list the attributes, which are in the GALL but not in the ANO-2 structures monitoring program, and provide justifications to the use of the structures monitoring program without those attributes.

RAI 3.5-7

Items 3.5.1-23 of Table 3.5.1 indicates that the applicant does not plan to monitor the spent fuel pool water level as stated in the GALL in managing liners for crack initiation and growth due to SCC; loss of material due to crevice corrosion. The applicant is requested to provide justifications for the exclusion of this GALL AMP.

RAI 3.5-8

Items 3.5.1-33 of Table 3.5.1 indicates that the applicant intends to use inservice inspection (IWF) and boric acid corrosion prevention programs to manage the crack initiation and growth due to SCC for high strength low-alloy bolts instead of using the GALL Bolting Integrity program. The applicant is requested to identify bolts that have actual yield strength equal to or greater than 150 ksi and provide justification for not using the Bolting Integrity program.

RAI 3.5-9

The intended function of the intake canal, as listed on Table 3.5.2-3, is to provide structural or functional support to equipment required to meet the Commission's regulations for the five regulated evens in 10 CFR 54.4(a)(3). Section 2.4.3 of the LRA states that the intake canal provides a suction source for fire water and service water pumps. However, the applicant provides no AMP for the intake canal. The applicant is requested to provide justification for not providing an AMP for the intake canal and to explain how the intend function can be met without an AMP.

DISTRIBUTION: Ltr to Mr. Jeff Forbes, Entergy Operations, Inc. Re: ANO-2, Dated: April 14, 2004

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