May 5, 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, SECTION 3.3 AUXILIARY SYSTEMS (TAC NO. MB8402)

Dear Mr. Forbes:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing a license renewal application (LRA) submitted by Entergy Operations, 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 3.3 Auxiliary Systems. These RAIs have been discussed with your staff.

Your responses to these RAI's are requested within 30 days from receipt of this letter. If you have any questions, please contact me at (301) 415-1124 or e-mail 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
AUXILIARY SYSTEMS FOR
ARKANSAS NUCLEAR ONE - UNIT 2
LICENSE RENEWAL APPLICATION (TAC NO. MB8402)

Auxiliary System

RAI 3.3-1

LRA Tables 3.3.2-5 and 3.3.2-11 identify cracking-fatigue as an aging effect requiring aging management, but LRA Section 4.3.2 states that, "Engineering evaluations identified no non-class 1 pressure vessels, heat exchangers, storage tanks or pumps requiring evaluation for thermal fatigue." The applicant credits the periodic surveillance and preventive maintenance program for managing this aging effect in the CVCS pump casing and the system walkdown aging management program for various components in miscellaneous systems in scope for Title 10 *Code of Federal Regulations* Part 54.4(a)(2) (10 CFR 54.4(a)(2)). Clarify the type of fatigue managed by these inspections, the basis for these inspections in lieu of a TLAA and explain how the inspections are effective in detecting internal cracks prior to loss of the intended function, including operating experience.

RAI 3.3-2

The LRA aging management evaluation credits the water chemistry control program for managing aging effects for various components in the auxiliary systems, but it is not clear which specific subprogram is used to manage each component. Clarify which subprogram manages each auxiliary system component. Also, identify any additional inspection programs such as one-time inspections, that will be used to verify the effectiveness of the chemistry control program. Provide a description of the elements of the inspection program as defined in Appendix A.1 of the SRPLR including details such as inspection methods, how susceptible locations are determined, basis for inspection population and sample size, timing, acceptance criteria including codes and standards, and operating experience. LRA Table B-1 identifies that one-time inspections are not applicable. If periodic inspections are planned rather than one-time inspections, identify the frequency. If opportunistic inspections are planned rather than one-time inspections, how does the program assure that the inspections will be completed prior to the end of the existing operating license? Identify any specific operating experience (i.e., inspection results) relevant to inspections to verify effective chemistry control in auxiliary systems that demonstrate the effectiveness of the inspection program.

RAI 3.3-3

LRA Tables 3.3.2-3 and 3.2.3-7 states that, "Flex hose exposed to an internal treated water and untreated air environments, and fuel oil environment, respectively, are managed by the periodic surveillance and preventive maintenance program." The description of the periodic surveillance and preventive maintenance program in LRA Section B.1.18 does not identify inspection criteria for the flex hose. Identify the method of maintenance inspections applied to the flex hose, the frequency of inspections and the technical basis for the inspections. If inspection is limited to the external surfaces, justify the basis considering manufacturer's recommendations, industry two practices and operating experience. Also clarify if elastomer hoses used in auxiliary

systems are to be replaced at specified intervals according to manufacturer's recommendations and standard industry practice.

RAI 3.3-4

LRA Tables 3.3.2-3 and 3.3.2.4 for the emergency diesel generator system and the alternate AC diesel generator system identify treated air and untreated air as an environment for various components in these systems. It is understood that the portions of these systems with treated and untreated air are the starting air subsystems normally containing compressed air. Compressed air systems are susceptible to loss of material due to internal condensation, unless effective measures are provided to remove moisture. Identify any specific operating practices used to remove moisture such as the continuous use of air driers or manually draining air receivers. Also provide justification that the loss of material in the starting air subsystems containing either treated air or untreated air is effectively managed. For example, identify specific operating experience including internal inspection results at susceptible locations.

3.3.2.4.1 Spent Fuel Pool System

RAI 3.3.2.4.1-1

LRA Table 3.3.2-1 identifies that, for stainless steel spent fuel racks in a treated borated water environment, cracking is an applicable aging effect requiring aging management. The operating temperature for these environments is not identified. Clarify why cracking is not a similarly applicable aging effect requiring aging management for the stainless steel fuel transfer tubes in a treated borated water environment.

3.3.2.4.3 Emergency Diesel Generator

RAI 3.3.2.4.3-1

Loss of material due to wear is an applicable aging effect on elastomer expansion joints and flex hose. However, in Table 3.3.2-3 of the LRA, this aging effect/aging mechanism is not identified for the elastomer expansion joints and flex hose. The applicant is requested to provide justifications as to why this aging effect/mechanism is not identified as an applicable aging effect for the elastomer expansion joints.

RAI 3.3.2.4.3-2

LRA Table 3.3.2-3 states that carbon steel and stainless steel expansion joints exposed to an internal exhaust gas environment is managed by the TLAA-metal fatigue program and the periodic surveillance and preventive maintenance program. Explain why the wall thinning program applied to the stainless steel expansion joints exposed to exhaust gas of the alternate AC diesel generator system is not applied to the carbon or stainless steel expansion joints in the emergency diesel generator system. Identify and justify the method and frequency of inspection. Clarify if the inspections of the expansion joint bellows include internal inspections for cracking and loss of material as recommended in industry standards such as EPRI report 1008035.

3.3.2.4.4 Alternate AC Diesel Generator System

RAI 3.3.2.4.4-1

LRA Table 3.3.2-4 credits the periodic surveillance and preventive maintenance program for managing fouling in heat exchanger tubes. A periodic diesel generator test alone may not be adequate verification that the required heat transfer is maintained under all applicable design conditions. Clarify how the inspections and testing are performed to ensure that fouling does not adversely affect heat transfer by using proven practices such as periodic heat balances to specific industry standards.

3.3.2.4.5 Chemical and Volume Control System

RAI 3.3.2.4.5 -1

Clarify if any CVCS components located in a high temperature treated borated water environment are cast stainless steel materials susceptible to the aging effect of loss of fracture toughness/thermal aging embrittlement. Provide the technical basis if this aging effect is not applicable to CVCS components. Otherwise, specify the applicable aging management program.

3.3.2.4.7 Fuel Oil System

RAI 3.3.2.4.7-1

The LRA identifies cracking as an applicable aging effect for some stainless steel components in a fuel oil environment (such as filter and thermowell) but not others in the same environment (such as indicator housing and orifice). Clarify the environments, including temperatures, applicable to stainless steel components in the fuel oil system to justify the difference in the identified aging effects.

3.3.2.4.8 Service Water System

RAI 3.3.2.4.8-1

The LRA does not identify biofouling as an aging effect/mechanism in the service water system. GALL identifies biofouling as an aging effect/mechanism for service water systems. Clarify what aging effect due to biofouling and/or silting is applicable to service water components. If this applicable aging effect is not loss of material, clarify which specific aging management program is applicable to manage biofouling in service water components.

RAI 3.3.2.4.8-2

LRA Table 3.3.2-8 identifies loss of material as an aging effect requiring aging management for the stainless steel expansion joints, but cracking is not addressed. Industry documents such as EPRI report 1008035, Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools Revision 3, indicate that stainless steel expansion joints are susceptible to cracking when exposed to contaminants. Identify if cracking is considered to be an aging effect for these

expansion joints and explain how the credited aging management programs effectively manage cracking, if applicable.

3.3.2.4.10 Control Room Ventilation System

RAI 3.3.2.4.10-1

The LRA identifies that all components in a carbon dioxide environment are not subject to any aging effect. Dry carbon dioxide is not a degrading environment for carbon steel, or brass or bronze components, but carbon steel components may be susceptible to corrosion in the presence of moisture in the carbon dioxide environment. Clarify the degree of dryness of the carbon dioxide environment. Identify the activities in place to verify and maintain the degree of dryness of the carbon dioxide environment necessary to minimize aging degradation of carbon steel components during the period of extended operation, including the effects resulting from operations to replenish or refill the carbon dioxide.

3.3.2.4.11 Miscellaneous Systems in Scope for 10CFR54.4(a)(2)

RAI 3.3.2.4.11-1

LRA Table 3.3.2-11 identifies filter housings and other components exposed internally to treated borated water and other environments with a pressure boundary intended function. The system walkdown and water chemistry control programs are credited for managing loss of material and cracking of the internal surfaces in these components. LRA Section B.1.28 describes the system walkdown as a visual inspection of external surfaces. Clarify how a visual inspection of external surfaces assures that internal surfaces are effectively managed, when the internal and external environments are different. If evidence of leakage is necessary to determine that an aging effect has occurred, provide technical justification that a failure of the pressure boundary is acceptable.

Arkansas Nuclear One, Unit 2

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