April 17, 2000

Mr. Craig G. Anderson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 SR 333
Russellville, Arkansas 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE ARKANSAS NUCLEAR ONE, UNIT 1, LICENSE RENEWAL APPLICATION

Dear Mr. Anderson:

By letter dated January 31, 2000, Entergy Operations, Inc. (Entergy), submitted for the Nuclear Regulatory Commission's (NRC's) review an application pursuant to 10 CFR Part 54, to renew the operating license for Arkansas Nuclear One, Unit 1, (ANO-1). The NRC staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete its safety review. Specifically, the enclosed questions are from the Electrical and Instrumentation and Controls Branch and the Mechanical Engineering Branch regarding Sections 2.5, and 3.5, and portions of Section 4.4.

Please provide a schedule by letter, electronic mail, or telephonically for the submittal of your responses within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with Entergy prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

Sincerely,

/***RA***/

Robert J. Prato, Project Manager
License Renewal Project Directorate
Division of Regulatory Improvement Program
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosure: Request for Additional Information

cc w/encl: See next page

Mr. Craig G. Anderson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 SR 333
Russellville, Arkansas 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE ARKANSAS NUCLEAR ONE, UNIT 1, LICENSE RENEWAL APPLICATION

Dear Mr. Anderson:

By letter dated January 31, 2000, Entergy Operations, Inc. (Entergy), submitted for the Nuclear Regulatory Commission's (NRC's) review an application pursuant to 10 CFR Part 54, to renew the operating license for Arkansas Nuclear One, Unit 1, (ANO-1). The NRC staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete its safety review. Specifically, the enclosed questions are from the Electrical and Instrumentation and Controls Branch and the Mechanical Engineering Branch regarding Sections 2.5, and 3.5, and portions of Section 4.4.

Please provide a schedule by letter, electronic mail, or telephonically for the submittal of your responses within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with Entergy prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

Sincerely,

/***RA***/

Robert J. Prato, Project Manager
License Renewal Project Directorate
Division of Regulatory Improvement Program
Office of Nuclear Reactor Regulation

Docket Nos. 50-313

Enclosure: Request for Additional Information

cc w/encl: See next page

DISTRIBUTION: See next page
DOCUMENT NAME:C:\rais 2.5,3.5,4.4.wpd

OFFICE	LA	PM:PDLR	PDLR:D
NAME	EHylton	RPrato	CIGrimes
DATE	4/18/00	4/ 17 /00	4/17 /00

OFFICIAL RECORD COPY

REQUEST FOR ADDITIONAL INFORMATION
ARKANSAS NUCLEAR ONE, UNIT 1
LICENSE RENEWAL APPLICATION, SECTIONS 2.5, 3.5, and 4.4

Section 2.5 Electrical and Instrumentation and Controls System Scoping and Screening Results

2.5.2-1 Sections 2.1 and 2.2 of the application describe the scoping methodology and process at a system level, and Table 2.2-1 containing a list of site systems and identifies which of those systems are (and are not) in the scope of license renewal. Although electrical and instrument and control components and component types that are subject to an aging management review (AMR) are identified, the application does not contain a list of these electrical components/component types. To assist the staff in its review, provide a list of electrical and instrumentation and control components/component types (e.g., relay, breaker, fuse, motor.....) for the systems identified in Table 2.2-1 and identify which of those components/component types are subject to an AMR. In addition, identify the components that are specifically part of fire protection.

2.5.3-1 Section 2.5.3 of the application describes the screening process used to identify the electrical structures and components subject to an AMR. NEI 95-10, Appendix B, provides guidance on long-lived, passive electrical and instrumentation and control components, or commodity groupings that require an AMR.

a. Structures and components that are within the scope of the rule and that perform a pressure boundary intended functions without moving parts, or without a change in configuration or properties (passive), and that are not replaced based on qualified life or a specified time period (long-lived) require an aging management review. The staff was unable to identify any discussion(s) involving the pressure boundary function for the following components: radiation monitors (including sensors and transmitters); elements; RTDs; sensors; thermocouples; transducers; and, heat tracing and heaters, in Section 2.5 of the ANO-1 LRA. Identify specifically where in the LRA or provide a justification as to why these components are not subject to an AMR.

b Passive, long-lived components that are within the scope of the rule and that provide physical support or protection for safety-related electrical equipment are typically subject to an AMR. The staff was unable to identify any aging management discussion(s) involving instrument racks, frames, panels, and enclosures; and, electrical panels, racks, cabinets, and other enclosures, in Section 2.5 of the ANO-1 LRA. Identify specifically where in the LRA or provide a justification as to why these components were not subject to an AMR.

c. On the basis of the information in 10 CFR 54.21, NEI 95-10, Appendix B, and Section 2.5.3.3 of the LRA, which identifies cables and connectors as being subject to an aging management review, more detail with respect to type and categorization of cables (such as power cable, instrument cable, control cable, communication cable, bare cable, and uninsulated ground conductors) in the scope of license renewal is needed for the staff to perform its evaluation. Identify specifically where in the LRA each specific cable type including connections (e.g.,connectors, terminal blocks, and splices) is addressed in the ANO-1 LRA; or provide a justification as to why each specific type of cable within the scope of license renewal is excluded from an AMR.

2.5.4-1 Section 2.5.4 of the application describes the electrical SSCs that were determined not to be within the scope of license renewal because these SSCs are non-safety-related, are part of a larger complex assembly, or are active. The electrical SSCs identified below perform an intended function without moving parts, without a change in configuration or properties, and they are not subject to replacement on the basis of qualified life or a specified time.

a. Electrical Buses under section 2.5.4.1 were generically excluded from the scope of license renewal based on the characterization that those buses were not safety-related. A component can not be excluded simply because they are non safety-related. Any component, including an electrical bus, that is non safety-related but whose failure could prevent satisfactory accomplishment of the function identified in 10 CFR 54.4(a)(2) or a(3), needs to be included within the scope of license renewal. On the basis of this discussion, provide a justification for excluding electrical buses discussed under Section 2.5.4.1 from the scope of license renewal.

b. Insulators under Section 2.5.4.2 were generically excluded from an AMR on the characterization that they were "part of a larger complex assembly or not safety-related." A component can not be excluded from an AMR simply because it is part of a larger complex assembly. Therefore, if a complex assembly is within the scope of the rule, and a component within that complex assembly is determined to be passive and long-lived, that component should be subject to an AMR. In addition, any component that is non safety-related but whose failure could prevent satisfactory accomplishment of the functions identified in 10 CFR 54.4(a)(1), needs to be included within the scope of license renewal. If any non safety-related component within the scope of license renewal perform its function(s) without moving parts or without a change in configuration or properties, and are not replaced based on qualified life or specified time period, are subject to an AMR. On the basis of this discussion provide a justification for excluding the insulators discussed under Section 2.5.4.2 from an AMR.

Section 3.5 Steam and Power Conversion Systems

3.5-1 Section 3.5.1 of the application states that the steam and power conversion systems are exposed to treated water, lube oil, nitrogen, air, and ambient atmosphere. Are the components of the condensate storage and transfer system (CSTS) also exposed to an environment of raw water? In CSTS systems of similar plants, the secondary side of the main condensers and condensate coolers are in contact with raw water. If these components are exposed to raw water then loss of material due to general corrosion and fouling are applicable aging effects that should be addressed.

3.5-2 Do the components of the steam and power conversion systems have two types of materials jointed together, such as carbon steel jointed with stainless steel? If so, identify the components that makeup connections involving dissimilar metals. Identify the components potentially affected by the loss of material due to galvanic corrosion and describe how the aging effects due to galvanic corrosion is managed during the period of extended operation.

3.5-3 The emergency feedwater system contains valve components made of cast iron. Address the aging effects of selective leaching in these cast iron components and describe how the aging effects due to selective leaching of cast iron components will be managed during the period of extended operation. Also address the plausible aging mechanism of pitting corrosion in these components and how this aging effect will be managed during the period of extended operation.

3.5-4 Table 3.5-1 identifies an augmented ISI special inspection program of Q stainless steel piping. Explain the term "Q stainless steel piping." Describe the aging effects associated with "Q stainless steel piping" and describe how the augmented ISI program meets the ten point criteria for an effective AMP.

3.5-5 Table 3.5-4 identifies a condensate storage tank level monitoring program as the AMP to manage the aging effect of loss of material. Identify which specific aging management program listed in Section 3.5.3 that describes this program. Also describe how this AMP manages the effects of aging. If it is intended to monitor the loss of tank fluid level due to leakage caused by loss of material, then that program is being used as failure detection and not aging management. An AMP is expected to limit or monitor the loss of material to ensure that minimum wall thickness is maintained consistent with the CLB to prevent leakage from occurring.

3.5-6 Section 3.5.3 of the LRA does not identify aging due to mechanical vibration as an applicable aging effect. Industry operating experience has identified cracking from mechanical vibration as a potential aging effect for the piping system components in the steam and power conversion systems. Identify where in the LRA is this aging effect addressed. If not, provide a justification as to why cracking from vibration is not a potential aging effect at ANO-1.

3.5-7 Pitting and crevice corrosion were also not identified as a potential aging effect for piping flange connections that are part of the steam and power conversion systems in Section 3.5. Identify where in the LRA this aging effect is addressed.

3.5-8 In the course of operation, there are often problems or issues related to aging effects that were not anticipated and there was no discussion of an operating history review being performed in Section 3.5. Describe the plant-specific and industry operating history reviews and results used to identify the potential aging effects associated with the SPCSs.

3.5-9 With respect to the wall thinning program described in Section 3.7 of Appendix B, please provide the following information:

a. Describe the aging mechanisms in sufficient detail to allow the staff to assess the adequacy of the AMP.

b. Is loss of material an applicable aging effect of the main feedwater and condensate storage and transfer systems? If so, explain why the main feed water system and the condensate storage and transfer systems are not addressed by this program.

c. The program indicates that the sample size for the inspections will be determined based on the operating experience prior to these inspection activities. Explain what operating experience will be used if there are no previous results of similar inspections. Also provide details on how the samples and sample sizes are determined.

d. This program suggests that because the results of visual inspections have been effective in managing the effects of aging, the new wall thinning inspection program based on non-destructive examinations that are not visual will also be effective. Explain the basis for this conclusion.

3.5-10 With respect to the bolting and torquing activities program described in Section 4.4 of Appendix B, the LRA indicates that the acceptance criterion is "no loose fasteners." Describe how this criterion is evaluated. For example, is this based on samples of bolts that will be tested by torque determinations or by measurements of the breakaway torque?

3.5-11 With respect to the secondary chemistry monitoring program described in Section 4.6.2 of Appendix B, provide the following information:

a. Table 3.5-1 and 3.5-3 identifies the secondary chemistry monitoring program as an AMP for the main steam system and the emergency feedwater system; these systems are not discussed in Section 4.6.2 of the LRA. Explain this discrepancy and identify where these programs are discussed in association with the secondary chemistry control program.

b. The program does not clearly describe the activities for prevention and mitigation of the aging effects. For example, the program refers to 'adequate processes' to assure aging effects are mitigated, but do not identify these processes. The program also refers to 'allowable values' and 'allowable ranges' without any discussion as to the basis for those values and ranges. Describe the secondary chemistry control program particularly as it applies to the Main Steam and Emergency Feedwater Systems using the ten elements for an AMP from the standard review plan in sufficient detail to allow the staff to adequately evaluate the programs adequacy.

c. The program refers to 'contaminants' as monitored parameters but does not identify them, e.g., sodium chloride, etc. Please identify the contaminants referred to in the program description.

d. The program refers to 'EPRI guidelines.' Does this refer to the EPRI "Secondary Water Chemistry Guidelines" (TR-102134, Rev. 3)?

3.5-12 With respect to the flow accelerated corrosion prevention program described in Section 4.9 of Appendix B, provide the following information:

a. The flow accelerated corrosion prevention program applies to main feedwater and main steam systems. Why is the condensate storage and transfer system not also covered by this program as indicated by Table 3.5-4?

b. The program does not identify preventative/mitigative actions such as water chemistry adjustments to control erosion/corrosion. Describe the preventative/mitigative activities built into this program. If the program does not contain preventative/mitigative activities, please provide a justification for not including these elements in the Accelerated Corrosion Prevention Program.

c. The acceptance criteria cites the ASME B31.1 Code design minimum wall thickness as a thickness below which corrective actions must be taken. However, the program description does not discuss trending of wall thickness to determine the rate of wall thickness loss so that continued operation will not reduce the wall thickness below the design minimum.

3.5-13 With respect to the emergency feedwater pump testing program described in Section 4.21.6 of Appendix B, the LRA indicates that the aging effects of fouling, loss of material, and loss of mechanical closure integrity are identified by verifying that each pump operates through a test loop path. Describe the program using the ten elements for an AMP from the standard review plan in sufficient detail to allow the staff to adequately evaluate the programs adequacy. Include an explanation on how flow testing through a test loop can identify each of these three aging effects throughout the applicable portions of the system. Also identify which system components are affected by this program.

3.5-14 With respect to the process for identifying aging effects requiring aging management for non-Class 1 components in Appendix C, address the following:

a. Section 1.4 on page C-10 states that for environments with extremely low oxygen content (< 0.1 ppm), crevice corrosion is non-significant. Provide a reference(s) for this threshold value.

b. Section 2.3.1 on page C-13 states that the condition for pitting corrosion to occur is the presence of halogens in excess of 150 ppb, oxygen in excess of 100 ppb and stagnant or low flow conditions. However, because of chemical concentration at locations of stagnant or low flow, pitting corrosion could occur at the those locations, even if the halogens and oxygen are below these limits.

c. Section 3.3.1 on page C-15 states that loss of material due to erosion-corrosion is an applicable aging effect under certain conditions. Describe these conditions for the four SPCS systems considered in the license renewal application.

d. Provide a justification as to why the loss of material due to crevice corrosion is not considered for systems having treated water environment (page C-15), raw water environment (page C-16), fuel oil environment (page C-19).

e. Section 6.3.1 on page C-20 states that little water is expected in the fuel oil system and MIC is not a concern for the ANO-1 fuel oil. However, in Section 6.3.2 on the same page, MIC is considered as an applicable aging effect for lubricating oil. Provide a basis as to why water in the fuel oil system and the resulting MIC is not a potential aging effect at ANO-1. In the past, water intrusion and the resulting MIC has been identified as a potential aging effect requiring an aging management program. An absence of MIC in the plant-

specific operating experience has been used to demonstrate the effectiveness of the actions taken to prevent/monitor for water intrusion and to examine for the presence of MIC. Unless ANO-1 fuel oil system is unique in design, loss of material caused by MIC needs to be identified as an aging effect requiring an AMP. Provide a justification for excluding the loss of material due to MIC or identify an AMP(s) to manage this effect of aging.

Section 4.4 Environmental Qualification

4.4.1 The discussion on Thermal Considerations on page 4-21 of the ANO-1 LRA states that "Temperature monitoring can be utilized to confirm lower than design temperatures exist in these [auxiliary building] areas, and on that basis, extend qualified lives into the license renewal period." It goes on to state "These [reactor building] temperature values have been refined by the collection of additional operating temperature data." The refined temperature data are utilized in the LRA to project the service life of various qualified equipment to the end of the period of extended operation.

Provide a summary description explaining how the refined temperature data were determined for each of the buildings addressed (i.e, the reactor building, the auxiliary building, the turbine building, and the alternate diesel building). The discussion should include the following:

a. the instrumentation and procedures used to obtain the refined temperature data,

b. the measurement location and the measures taken to ensure that the temperature data obtained are representative of the service environment in which the equipment being evaluated are installed,

c. the frequency of the measurements and how seasonal variations were accounted for,

d. the plant operating status during measurements and how variations in operating status were accounted for,

e. the measures taken to identify hot-spots and the measures taken to account for them in the re-analysis, and

f. how re-insulating the RCS and adding a new cooling unit (as discussed in Section 3.7.2.1) affected the temperatures in the reactor building and measures taken to account for the higher temperatures prior to re-insulating.

Also discuss future actions to ensure that these temperatures will carry forth throughout the period of extended operation.

4.4.2 Section 4.4 of the ANO-1 LRA states that "If excess conservatism exists in the original qualified life determination, then reanalysis could be performed to extend the qualified life." However, the LRA does not address whether there have been any major plant modifications or events at ANO-1 of sufficient duration to have changed the temperature and radiation values that were used in the underlying assumptions in the EQ calculations, and whether the conservatism in the EQ equipment qualification analyses

are sufficient to absorb environmental changes occurring due to plant modification and events. Also, the ANO-1 LRA does not address the controls used to monitor changes in plant environmental conditions to periodically validate the environmental data used in re-analyses. Provide additional information on the following:

a. Have there been any major plant modifications or events at ANO-1 of sufficient duration to have changed the temperature and radiation values that were used in the underlying assumptions in the EQ calculations?

b. Is the conservatism in the EQ equipment qualification analyses sufficient to absorb environmental changes occurring due to plant modification and events?

c. What are the specific controls used to monitor changes in plant environmental conditions to periodically validate the environmental data used in re-analyses?

4.4.3 The ANO-1 LRA does not address refurbishment of EQ electrical equipment as an option for extending qualified life. Provide additional information on whether refurbishment is an option that will be used to extend qualified life, and, if so, what procedures and controls will be used to ensure that the qualification status of the equipment is preserved.

Arkansas Nuclear One
Docket No. 50-313

cc:
Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Vice President, Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Director, Division of Radiation
Control and Emergency Management
Arkansas Department of Health
4815 West Markham Street, Slot 30
Little Rock, AR 72205-3867

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

Winston & Strawn
1400 L Street, N.W.
Washington, DC 20005-3502

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Manager, Rockville Nuclear Licensing
Framatone Technologies
1700 Rockville Pike, Suite 525
Rockville, MD 20852

County Judge of Pope County
Pope County Courthouse
Russellville, AR 72801

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 310
London, AR 72847

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, N.W., Suite 400
Washington, DC 20006-3708
DJW@NEI.ORG

Mr. Doug Levanway
600 Heritage Blvd.
Jackson, MS 39201

Mr. Garry Young
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333 GSB-2E
Russellville, Arkansas 72802
young4@entergy.com