October 20, 2000

Licensee: Entergy Operations, Inc.

Facility: Akansas Nuclear One, Unit 1

SUBJECT: TELECOMMMUNICATION FOR CLARIFICATION OF INFORMATION RELATING TO ANO-1 LRA

On October 11, 2000, October 12, 2000, and October 13, 2000, the staff had conference calls with members of Arkansas Nuclear One, Unit 1 (ANO-1), to obtain clarifying information for the applicant's responses to the staff's request for additional information relating to the Reactor Coolant System, Auxiliary Systems, Structures, and Fire Protection System. Enclosed is a summary for each of the telecommunications. Each summary contains a list of attendees, a description of each of the staff's concerns, and the specific clarification or additional information being requested by the staff.

/RA/

Robert J. Prato, Project Manager
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-313

Enclosure: October 11, 2000 Telecommunications Summary
October 12, 2000 Telecommunications Summary
October 13, 2000 Telecommunication Summary

cc w/encl: See next page

October 20, 2000

Licensee: Entergy Operations, Inc.

Facility: Akansas Nuclear One, Unit 1

SUBJECT: TELECOMMMUNICATION FOR CLARIFICATION OF INFORMATION RELATING TO ANO-1 LRA

On October 11, 2000, October 12, 2000, and October 13, 2000, the staff had conference calls with members of Arkansas Nuclear One, Unit 1 (ANO-1), to obtain clarifying information for the applicant's responses to the staff's request for additional information relating to the Reactor Coolant System, Auxiliary Systems, Structures, and Fire Protection System. Enclosed is a summary for each of the telecommunications. Each summary contains a list of attendees, a description of each of the staff's concerns, and the specific clarification or additional information being requested by the staff.

/***RA***/

Robert J. Prato, Project Manager
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-313

Enclosure: October 11, 2000 Telecommunications Summary
October 12, 2000 Telecommunications Summary
October 13, 2000 Telecommunication Summary
cc w/encl: See next page

DISTRIBUTION: See next page

Staff members that contributed to each of these efforts are identified on each of the Telecommunication Summaries.
DOCUMENT NAME:C:\Telecom-3 RCS AUX SYS STRUC~.wpd

OFFICE	LA	PM:PDLR	PDLR:D
NAME	EHylton	RProto	CIGrimes
DATE	10/19/00	10/17/00	10/20/00

OFFICIAL RECORD COPY

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

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

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

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

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

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

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

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

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

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

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

Mr. Garry Young
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333 GSB-2E
Russellville, Arkansas 72802
gyoung4@entergy.com

October 11, 2000

Attendees:	Gary Young	ANO-1
	Allen Cox	ANO-1
	Ron Rasolli	ANO-1
	Larry Shea	ANO-1
	Natalie Mosher	ANO-1
	Roni Henory	ANO-1
	Bill Sims	ANO-1
	Dale James	ANO-1
	David Jeng	NRC
	Jim Davis	NRC
	Lee Banic	NRC
	Andrea Lee	NRC
	Barry Elliot	NRC
	Robert Prato	NRC
	Mano Subudhi	BNL

Subject: REACTOR COOLANT SYSTEM, AND FIRE PROTECTION SYSTEM TELECOMMUNICATION, OCTOBER 11, 2000

FIRE PROTECT AGING MANAGEMENT REVIEW ITEMS:

1. Confirm that the ANO-1 ceiling tiles, marinite board and false floor in the control room does not serve safety-related structural functions and that failure or collapse of these items will not affect the safety-related intended functions of the control room.

   The applicant responded that the ceiling tiles, marinite board and false floors are in the scope of license renewal solely based on its function(s) performed under 10 CFR 50.48. These components do not serve a structural safety function for the purpose of license renewal.

2. Briefly discuss ANO-1's basis for concluding that there are no plausible aging effects applicable to the above listed items including a discussion of past maintenance experience and inspection records of the same (e.g., did they ever experience cracking/disintegration of the items and as applicable, ANO-1's disposition of the degraded conditions).

   The applicant noted that they did an operating history review, including a review of past maintenance experience and inspection records and verified that all noted damage to these components were a result of mishandling during installation and maintenance activities and no experience of aging was noted.

3. Provide a verification that the ceiling tiles, marinite board and false floor in the control room, without implementation of an appropriate AMP, can still fully comply with the requirements of 50.48, "Fire Protection."

   The applicant agreed to provide this information.

RCS AGING MANAGEMENT REVIEW ITEMS:

3.3.2.2 RCS Piping and Letdown Coolers

RAI 3.3.2.2.2-1: In its response, the applicant states that Code Case N-560 includes provisions for the Examination Category B-F. However, there is no mention of such provision found in the Code Case. Also, the applicant has implied that the NRC letter to Mr. C. Randy Hutchinson entitled "Risk-Informed Alternative to Ceratin Requirements of ASME Code Section XI, Table IWB-2500-1 at Arkansas Nuclear One, Unit 1 (TACMA2023)," dated August 25, 1999 includes the dissimilar metal piping welds that are inspected at ANO-1 under Code Case N-560. The NRC letter did not discuss the dissimilar metal piping welds that are inspected at ANO-1. Further, the staff in its transmittal letter has specifically indicated "This authorization does not constitute an NRC approval of Code Case N-560 for generic use." In addition, Examination Category B-J requires sample weld inspections while Examination Category B-F requires all welds to be inspected in each inspection cycle. On the basis of this, the Examination Category B-F for dissimilar welds can not be replaced by the Examination Category B-J for pressure retaining welds and therefore, the applicant must demonstrate that the risk-informed alternative to Code requirements under Code Case N-560, in lieu of Examination Category B-J, will bound the Examination Category B-F requirements.

In its response to this concern, the applicant explained that the nozzle to safe-end welds is inspected to the requirmenets of ASME, Section XI, Examination Category B-F. The safe-end to pipe welds are inspected to the requirements of risk informed code case N-560 as documented in a letter dated May 17, 1999, from the applicant. In addition, discuss the reason for selecting the risk informed inspection points for 40 years and show that they correlate to aging effects applicable to the period of extended operation to justify the use of the inspection points selected for aging management. The applicant will document this information in their response to the staff and provide a copy of RAI #17.

RAI - ##### Piping > 4 inch NPS at ANO-1 are subject to both volumetric and surface examinations in addition to leakage detection, while piping >1 inch and < 4 inch NPS is subjected to only surface examination and leakage detection. Piping ÿ1 inch NPS is subjected to leakage detection only. Operating experience has shown that cracking originates from the inside surface of the piping and therefore, any through-wall crack in piping <4 inch NPS will left unnoticed until the piping fails under a design basis loading. Therefore, the staff concluded that one time volumetric inspection of small bore piping is a requirement for license renewal of B&W plants. However, the applicant has not included in its LRA the one time volumetric inspections of small bore RCS piping and nozzles required by the FSER for BAW-2243A.

The applicant responded that the Small Bore Piping Inspection Program, applies to piping >1 and <4 inches NPS and requires use of risk informed volumetric examinations. Refer to page B-40 of the LRA that states: "As part of the risk-informed ISI program, ANO-1 Code Case N-560 has selceted for volumetric examinations, a sample population of welds in the following Class 1 small bore piping: 1.5-inch pressurizer spray line, 2.5-inch makeup and purification lines, 2.5-inch letdown line, and 1.5-inch cold leg suction drain line. Are any of these welds socket welds? Socket welds are not allowed by code case N-560. If socket welds are included, how do you do volumetric exams on these locations. How and where was this justified in the May 17, 1999 letter?

The applicant also needs to discuss the aging effects for 60 years of operation and its correlation on the selection criteria used to determine the most susceptible small bore piping identified in the ANO-1 risk informed evaluation of pressure boundary piping.

RAI - ##### To manage potential PWSCC cracking of Alloy 600 and Alloy 82/182 locations including the hot leg flow meter element in the RCS piping, the applicant has implemented the Alloy-600 AMP at ANO-1. The program was developed on the basis of recommendations provided by the B&WOG, as a result of NRC's issuance of the Information Notice (IN) 90-10. The scope of the program includes the flow meter section of the hot leg. However, the ANO-1 program does not address the one-time inspection of the Alloy 82/182 cladding in the flow meter section of the hot leg, as suggested in the FSER of BAW-2243A, to ensure that no cracking of the cladding or the underlying base metal degradation due to clad cracks has occurred. The staff notes that the sample selection for this AMP includes monitoring the most susceptible locations (for ANO-1, these locations are identified to be piping components in the pressurizer) to bound the Alloy 600 items and Alloy 82/182 weld locations. The applicant has not demonstrated either in its LRA or in its responses to RAIs, how the Alloy 600 program at ANO-1 bounds the one time volumetric inspections of the flowmeter section of the hot leg, as required by the FSER for BAW-2243A.

After a brief discussing clarifying this concern, the staff has no more question and needs no further information.

In March 2000, cracks were discovered in a number of ANO-1 Alloy 600 RCS hot leg level instrumentation nozzles during a visual inspection. A root cause evaluation determined the failure mode to be cracking caused by PWSCC. The design of the nozzles resulted in high residual stresses at the root of the Alloy 82 weld that connects the Alloy 600 nozzle to the ferritic piping. The high stresses led to cracking of the welds. The Alloy 600 susceptibility model did not indicate a high susceptibility to failure since the residual stresses in the nozzles were much higher than the stresses assumed in the evaluation. A new design was developed to eliminate the residual stresses associated with welding. Repairs were made using Alloy 690, which is more resistant to PWSCC than Alloy 600. It is not clear whether the applicant has evaluated any other cases at ANO-1 where such conditions may exist.

The applicant needs to provide a direct statement that the conditions that led to this failure do not exist elsewhere in the RCS including the high residual and thermal stress.

RAI 3.3.2.2.2.2-1 In Section 4.4.2 of the FSER for BAW-2243A, the staff suggested that the applicant develop a program to manage cracking of 1 inch NPS piping and less. It should be noted that in response to RAI 3.3.2.2.2.2-1, the applicant stated that "Inspection of the most risk-significant small-bore piping locations should bound the 1-inch NPS items that are not volumetrically inspected", however, no justification was given for this conclusion. Since the subject piping is exempt from surface and volumetric examination in accordance with ASME Section XI inspections, the staff questioned why piping ≤ 1 inch NPS is not included in the risk-informed selection of small bore piping welds.

The applicant stated that they would provide additional justification as to why they do not need to specifically examine piping ≤ 1 inch NPS. The staff request that the applicant provide a technical justification for why the applicant did not include piping <1 inch NPS in the risk-informed selection.

3.3.2.3 Pressurizer

RAI #####_# It is not apparent that the applicant identified the small bore piping and small bore nozzles inspection program for vent and sampling nozzles, thermowell, level sensing nozzles and sampling nozzles, as well as, for piping <4 inch NPS.

The applicant will provide a clarification that these inspections are being performed by Examination Category B-D as discussed on page 3-29.

RAI 3.3.2.6.2.2-3b Except for fatigue, the applicant identified aging effects in Section 3.2.6 of the LRA, but did not identify all applicable AMPs for each aging effect as requested in RAI 3.3.2.6.2.2-3b. In the applicants response to the staff's RAI the applicant indicated that "the ANO-1 Steam Generator Tube Integrity Program is an NRC-approved program," The applicant needs to clarify this statement since the NRC is not aware of such an approval? In addition, the applicant did not describe the changes, if any, in the SG tube integrity program at ANO-1 in order to address tube degradation identified in NRC IN 97-49 and 97-88.

The applicant discussed the aging effects in Section 3.2.6 and the applicable AMP. The applicant also informed the staff that it did not need to upgrade its SG tube integrity program as a result of the information notices in question. The S?G tube integrity program is contained in the ANO-1 TS and is basd on the applicant's responses to IN 97-49 and IN 97-88. No changes are necessary for the license renewal since the

information has been provided in response to the Ins. No additional action is required.

3.3.2.2 RCS Piping and Letdown Coolers

RAI 3.3.2.2.2.1-2 The applicant identified in its LRA Section XI ISI, Examination Category B-P, and leakage detection in reactor building are the only aging management programs for letdown coolers. In response to RAI 3.3.2.2.2.1-2, the applicant confirmed that the boric acid corrosion prevention program is also applicable to letdown coolers for managing the loss of external material. However, the applicant has not identified the auxiliary systems chemistry monitoring program as an applicable AMP for managing fatigue and stress corrosion cracking on the letdown cooler tube surfaces exposed to the treated water supplied by the intermediate cooling water.

The applicant will confirm that the Auxiliary Systems Chemistry Monitoring Program is the AMP used to manage stress corrosion cracking for the letdown cooler tube surfaces.

3.3.2.3 Pressurizer

RAI ######-# The aging effects identified by the applicant as being applicable to the pressurizer are listed in Table 3.2-1 of the LRA, and are summarized in Section 3.3.2.3.1 of this SER. The applicant has not identified that loss of material on the external surfaces of several pressurizer components (e.g., vessel, nozzles, piping) exposed to boric acid leakage is an applicable aging effect. In addition, the applicant has not explained why this aging effect is not applicable to pressurizer components at ANO-1.

The applicant will send a verification that the first row in Table 3.2-1 applies to all the components in question, and that the boric acid program is applicable to all pressure boundary external surfaces.

RAI #######-# Table 3.2.1 of the LRA indicates the examination category for inspection of pressurizer components. However, the applicant has not identified that vent, level sensing, and sample nozzles, and thermowell are to be inspected in accordance with ASME, Section XI, Examination Category B-E for pressurizer retaining partial penetration welds

The applicant will provide an explanation that ASME, Section XI, Examination Category B-E was deleted in the 1993 Addendum and the applicable components were moved to Examination Category B-P.

RAI #######-# The applicant has chosen Examination Category B-G-1 for pressurizer bolting $\leq$ 2 inch diameter instead of Examination Category B-G-2. In accordance with ASME Section XI, the Examination Category B-G-1 is

applicable to bolting > 2 inch diameter and the Examination Category B-G-2 for bolting ≤2 inch diameter.

The applicant will provide the staff with verification that bolting ≤ 2 inch diameter are inspected to Examination Category B-G-2.

RAI 3.3.2.3.2.2-1b In response to RAI 3.3.2.3.2.2-1, the applicant stated that the cracking model used for the Alloy 600 or Alloy 82/182 pressurizer components does not calculate times for 75% through-wall cracking, but only the relative susceptibility for PWSCC in Alloy 600 and Alloy 82/182 components. The three most susceptible groupings of components were given in the applicant's response, and it is stated that only two of these groupings undergo volumetric testing. The applicant should clearly identify these two groupings and, also, specifically state the schedule for the inspections, as requested in the RAI.

The applicant will clarify the exams performed on the applicable components and the bases for these exams. The applicant will also include the schedule for the groupings being inspected

RAI 3.3.2.4.2.2-1 Did the applicant perform the fluence calculations in accordance with BAW-2241A?

In a follow-up letter the applicant informed the staff the they used BAW-2241A approach to determine fluence at the inside surface of the reactor vessel beltline.

October 13, 2000

Attendees:	Gary Young	ANO-1
	Allen Cox	ANO-1
	Ron Rasolli	ANO-1
	Dan Wiggins	ANO-1
	Natalie Mosher	ANO-1
	John Richardsoni	ANO-1
	Bill Nicholes	
	Tanya Eaton	NRC
	Jim Davis	NRC
	Lee Banic	NRC
	Renee Li	NRC
	Robert Prato	NRC

Subject: FIRE PROTECTION SCOPING AND AUXILIARY SYSTEMS TELECOMMUNICATION, OCTOBER 12, 2000

Fire Protection Scoping:

The staff does not agree that the applicant has addressed any of the concerns identified in the following RAI's: RAI 2.3.3.2-3, RAI 2.3.3.2-5, RAI 2.3.3.2-7. The overriding concern is that fire protection SSC's are being excluded from within the scope of license renewal on the basis that they are not protecting safety-related equipment.

The overall objectives of Appendix A that are mentioned with respect to the fire protection program are aimed at achieving an adequate balance in "defense-in-depth" for the public health and safety through:

1. Reducing the likelihood of occurrence of fires;
2. Promptly detecting and extinguishing fires if they occur
3. Maintain the capability to safety shut down the plant if fires occur; and
4. Prevent the release of a significant amount of radioactive material if fires occur.

No one of these echelons can be perfect or complete by itself. Furthermore, the general requirements provided in GDC 3 to "minimize the adverse effects of fires on SSC's *important to safety"* are stated to provide a general level of protection which is afforded to *all* systems, not only where required to prevent a loss of safe shutdown capability. In fact, Section 9.8.1, "Fire Protection Design Basis" of the applicant's SAR, Part B, discusses how the fire protection system is designed to fight the fire hazard encountered in *all* plant areas, in accordance with Appendix A, GDC 3. The scope of GDC 3 goes beyond preserving only the ability to maintain safe shutdown in the event of a fire.

Finally, Appendix R to 10 CFR 50.48 states that except for the requirements of sections III.G., III.J., and III.O, the provisions of Appendix R to this part shall not be applicable to nuclear power plants licensed to operate prior to January 1, 1979, to the extent that fire protection features proposed or implemented by the licensee have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1 reflected in the

staff's safety evaluation reports issued prior to the effective date of this rule. The applicant's SER dated 8/22/78 was accepted by the staff as satisfying the provisions of Appendix A to BTP APCSB 9.5-1. Therefore, the *provisions* which the staff approved at ANO-1 satisfy 10 CFR 50.48. The requirements of Appendix R, Sections III.G., III.J.,and III.O, (which were backfit to ANO-1 since they already had an approved fire protection program through App. A to BTP 9.5-1), also form the current licensing basis for compliance to 10 CFR 50.48.

To address the 8/22/78 SER in more detail, the applicant states that the SER description of the objectives makes it clear that the focus is on safety-related equipment. From reviewing the SER, it is clear that the SER focused on that objective in addition to the others, based on the extent of the review. The SER conclusions state that significant steps were proposed by the licensee to assure that safe shutdown can be accomplished and that the plant would be maintained in a safe condition following potential fire situation. Since the staff applied the guidance of Appendix A using the overall objectives outlined above, it is clear from this statement that the SER did not only consider how the objectives relate to safety-related equipment, but to all systems.

The staff agrees that GL 86-10 and GL 88-12 allow licensees the ability to make changes to features in the approved fire protection program without prior approval only if those changes do not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. However, the staff disagrees with the applicant's statement that inclusion within scope of 10 CFR 54 of any fire protection features that "could be eliminated" without prior approval of the Commission under the provision of the license condition, would be inconsistent with the current licensing basis as defined in 10 CFR 54.3. Any FP SSC's that are currently relied upon in the current licensing basis as defined in 54.3 for compliance to 10 CFR 50.48, are required to be included within the scope of 54.4. The rule does not exclude fire protection SSC's from within scope on the basis that they "could" be eliminated in the future.

Therefore, the staff's view is that the SSC's (identified in the RAI's) excluded from within scope of license renewal for fire protection are "important to safety" in accordance with Appendix A, GDC 3 and the applicant's SER dated 8/22/78 and therefore, should be included within scope and subject to an AMR. Please address each RAI (RAI 2.3.3.2-3, RAI 2.3.3.2-5, RAI 2.3.3.2-7) individually and submit a response to the staff for further evaluation.

Response: *The applicant responded that the SSCs in question have never been within the scope of components intended to meet the fire protection requirements as established by its CLB as required under GDC 3, 10 CFR Part 50, Appendix R, 10 CFR 50.48 or Appendix A to Branch Technical Position (BTP) APCSB 9.5-1. The applicant also stated that in the latter part of the 1980s when they reevaluated their entire licensing basis and developed their fire protection list of SSCs (known as their F-List) they evaluated each of the SSCs in question and determine them to be outside the scope of SSCs required to demonstrate compliance with 10 CFR 50.48, the Fire Protection Rule. The applicant agreed to provide the staff with a documented evaluations for each of the SSCs in question.*

Because this issue is related to the applicant's current determination of which SSCs are required to demonstrate compliance with 10 CFR 50.48, the staff

considers this a CLB issue, and outside the scope of the current 10 CFR Part 54 review. This issue will be forwarded to Region IV for evaluation and resolution. The staff will place a high priority on this issue to try to complete it before the Commission makes its decision on renewing or not renewing the applicant's operating license, but will not delay the Commission's decision solely based on this issue.

Should Region IV find that the SSCs in question are needed to demonstrate compliance with 10 CFR 50.48, these components then need to be consider for an AMR. The applicant is required under 10 CFR 54.37(b) to perform an AMR and to issue an FSAR update required under 10 CFR 50.71(e) for any newly identified SSCs requiring an AMR. The applicant did confirm that their license renewal process will ensure that these and any other SSCs determined to be within the scope of license renewal will have an AMR review performed and will be included in the next FSAR update, as required.

Although the staff cannot consider this an open item under its review of the applicant's license renewal application, we will ensure the proper evaluation is performed in as timely a manner as possible.

Auxiliary Systems: The staff's request for more information relating to the Auxiliary Systems and the applicant's response to the staff's questions are provided in the following table:

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.1-GEN1(b)	3.3.4.3.1-1(b)	High strength bolting has been known to crack regardless of being subject to a wetted environment and needs an AMP.	No site-specific experience was found, this is consistent with industry experience, GSI-29 closed. Response to GL 91-17 was accepted by staff. No addition information is needed.
3.3.4.3.1-GEN1(c)	3.3.4.3.1-1(c)	Verify that there are no Stainless Steel components, including piping, in the Rx Bldg. Sump and Drain System or in the Spent Fuel Pool System that are exposed to concrete.	Rx Building sump piping is embedded in concrete and discussed in RAI-3.3.4.3.2.4-3. No addition information is needed.
3.3.4.3.1-GEN2(a)	3.3.4.3.1-2(a)	Your response is not clear as to what applies, ASME code that requires a fatigue analysis, or B31.1 and 31.7 that allows for 7000 thermal cycles. Second paragraph refers to thermal fatigue threshold which relates to the ASME code. We also need to know the current and project number of cycles for the staff to adequately assess your response.	The applicant needs to provide a summary description of the thermal fatigue threshold, maximum number of cycles, and a correction to text of the first response provided by the applicant.
3.3.4.3.1-GEN2(b)	3.3.4.3.1-2(b) 3.3.4.3.2-1(b)&(e) 3.3.4.3.1-6	Each of these three RAIs are interrelated. The concern is aging of elastomers. Your AMR refers to loss of material when the staff is concerned about change in material. Refer to RG 1.52, and GALL. GALL, page viii F1-7, states that a TLAA for wear, temperature and radiation should be done to justify no AMR is required.	The applicant needs to provide a clarification of the applicable aging effect and the criteria used.

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
	3.3.4.3.1-2(b) 3.3.4.3.2-10 3.3.4.3.2.5-1	The staff accepts the position that vibration is a design concern that will be identified early in the operating life of the plant in most cases. For high vibration applications such as diesel generators, the staff has consistently required an aging management program for potential loss of bolt torque and the loss of mechanical closure integrity.	The EDG and Fuel Oil System AMPs provide for a bolt torque check. The applicant needs to add a bolt torque check to the AMP for the AAC DG.
3.3.4.3.1-GEN2(c)	3.3.4.3.1-2(c)	Clarify the following statement from your response: “seismic Category 1 structures are designed to prevent these non-seismic Categroy 1 components from causing loss of safety function of safety-related components and structures,” as used in context with Seismic II/I.	The applicant will revise the paragraph in question.
3.3.4.3.1-GEN4	3.3.4.3.1-4	Tables 3.4-12 and 3.4-13 shows carbon steel in a gas-air environment with no aging effect or AMP.	No addition information is needed.
3.3.4.3.1-FP1	3.3.4.3.1.2-1	Provide a discussion of why bio-fouling or buildup of sediment is not an aging effect for loss of system flow.	The applicant will discuss the Service Water Integrity Program that provides biosides, visual inspection of pipe interior, and system flushes
3.3.4.3.1-FOS2(a)	3.3.4.3.1.7-4	Per telecom, applicant was to correct table or provide a documented description of the needed correction.	The applicant will provide this information

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.1-IA1(f)	3.3.4.3.1.8-1	For the IA System, the applicant states that keeping the internal environment dry and free of contaminants prevents loss of material. In your AMR did you consider galvanic corrosion as a potential contributor to the loss of material, if so, how does this statement apply, if not, why not.	The applicant will provide verification that they did consider galvanic corrosion and that the IA Quality Program is used as the AMP to keep the system dry to prevent galvanic corrosion.
3.3.4.3.1-GEN6(d)	3.3.4.3.2-6	Demonstrate that cracking is adequately managed for stainless steel, brass, bronze, and copper components in the EDG, AAC Generator and Chilled Water System.	The staff will reevaluate the need for more information. No addition information is currently needed.
3.3.4.3.2-GEN7(b)	3.3.4.3.2-7(b)	The applicant basically takes credit for failure portection as its AMP, which is not acceptable to the staff.	The staff will reevaluate the need for more information. No addition information is currently needed.
3.3.4.3.2-GEN8(a)	3.3.4.3.2-8(a)	What is meant by Footnote 1("Aging effects prevented by referenced program/activity") in the tables under Section 3.3.4	The applicant will describe the intent of the footnote.
3.3.4.3.2-GEN9(b)	3.3.4.3.2-9(b)	Add EDGs and Chill Water to Appendix B for loss of mechanical closure integrity.	The applicant will provide verification that mechanical integrity needs to be added the AMP.
3.3.4.3.2-GEN9(e)	3.3.4.3.2-9(c) 3.3.4.3.2-9(d)	Is ANO-1 on an 18 or 24 month refuel cycle?	The applicant will identify their current refueling cycle.

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.2-FP2(a)	3.3.4.3.2.2-2(b)	The staff requested the physical boundaries for each of the pressurization and flow tests but they were not provided. Provide the physical boundaries. Also, please provide the different surveillance Entergy takes credit for aging management of the FP System and the applicable codes.	The applicant will provide marked-up drawings.
3.3.4.3.2-FP3(b)	3.3.4.3.2.2-3(b)	Do you use point, grid, of full wall scans of the different segments of piping.	The applicant will identify the method and explain why it is adequate.
3.3.4.3.2-FP3(c)	3.3.4.3.2.2-3(c)	Discuss monitoring and trending requested in RAI for timely detection of degradation prior to exceeding CLB for wall thickness.	The applicant will discuss the use of monitoring and verify that no trending is used.
3.3.4.3.2-FP3(e)	3.3.4.3.2.2-3(d)	Response indicates that this AMP may not be effective. Would have the program identified the three failures that occurred, has the program help to initiate corrective actions before any other failure occurred. On what basis should the staff find the program effective if it failed three times in two years without any positive indication.	The applicant will discuss the failures in question and discuss the program's success in detecting degradation.
3.3.4.3.2-FP4(b)	3.3.4.3.2-4(b)	Are corrosion coupon located in the Fire Protection system?	The applicant will discuss the location of coupons and how it applies to the FP System.

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.2-FP4(c)	3.3.4.3.2.2-3(b)	Response indicates that this AMP may not be effective. Would have the program identified the three failures that occurred, has the program help to initiate corrective actions before any other failure occurred. On what basis should the staff find the program effective if it failed three times in two years without any positive indication.	This is a repeat of a previous question. No addition information is needed.
3.3.4.3.2-EDG2	3.3.4.3.2.3-2 ??????????	Staff expressed concern that significant loss of material or cracking may remain undetected so loss of intended function may not be prevented. Existing program relies on failure detection to manage aging. Clarification on assurance that management of aging without loss of function is requested. Also, Staff requests that Applicant consider “one-time” inspection of selected locations to ensure significant cracking does not exist.	The applicant will discuss the preventive AMP, and the potential of cracking effecting the intended function. The applicant will include in its discussion the visual, vibration and operational testing performed.
3.3.4.3.2-AAC1(a)	3.3.4.3.2.5-1 ??????????	Pressure boundary is verified through operation of system. A significant loss of material may exist that is not manifested until failure of the pressure boundary. This is not aging management. Would a “one-time” inspection of certain components be warranted?	The applicant will provide a summary description of the manufacturer’s recommendations.
3.3.4.3.2-AAC1(b)	3.3.4.3.2.5-1 ??????????	Information on inspections to detect aging effects and acceptance criteria was requested, but not provided by Applicant.	The applicant will provide a summary description of the manufacturer’s recommended acceptance criteria.

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.2-FOS6(a)	3.3.4.3.2.7 ??????????	Applicant needs to provide assurance that criteria in Diesel Fuel Monitoring Program ensure timely detection of loss of heat transfer capability.	The applicant will provide the information requested for the AACDG and will verify that the EDG does not have a heat exchange for DFO.
3.3.4.3.2-FOS7(a)	3.3.4.3.2.7 ??????????	Applicant needs to identify acceptance levels of impairment of heat transfer function of heat exchanger tubes and the bases for those levels	The applicant will provide the information requested for the AACDG and will verify that the EDG does not have a heat exchange for DFO.
3.3.4.3.2-FOS7(b)	3.3.4.3.2.7 ??????????	Applicants needs to submit information demonstrating acceptable performance of the AAC DG Testing and Inspection Program in ensuring heat transfer capacity of the heat exchanger	The applicant will provide the information requested for the AACDG and will verify that the EDG does not have a heat exchange for DFO.
3.3.4.3.2-CW2(b)	3.3.4.3.2.9-2	Applicant states that minimum thickness will be maintained to assure seismic qualification, not to maintain minimum wall thickness to assure pressure boundary, the system intended function, why?	The applicant will explain that Seismic values are more restrictive than pressure boundary values.
3.3.4.3.2-SW1(c)	3.3.4.3.2.10-1(c)	Provide a technical justification for the statement that “recent piping replacements and use of corrosion inhibitors make extensive thickness mapping not required.”	The applicant will provide a discussion as to why improvements reduces the need to thickness mapping.
3.3.4.3.2-SW1(f)	3.3.4.3.2.10-1(f)	Explain the safety analysis assumed flows and system hydraulic conditions and how it relates to your CLB.	The applicant will provide a clarification on how these assumptions relate to their CLB.

ANO-1 RAI/RESPONSE COMPARISON - AGING MANAGEMENT PROGRAMS			
INEEL Question	**NRC Question**	**Comments**	**Response**
3.3.4.3.2-SW3	3.3.4.3.2.10-2	Applicant states that minimum thickness will be maintained to assure seismic qualification, not to maintain minimum wall thickness to assure pressure boundary, the system intended function, why?	The applicant will explain that Seismic values are more restrictive than pressure boundary values.

October 16, 2000

Attendees:	Gary Young	ANO-1
	Allen Cox	ANO-1
	Natalie Mosher	ANO-1
	Larry Shea	ANO-1
	Reza Ahrabli	ANO-1
	David Jeng	NRC
	Mark Hartzman	NRC
	Robert Prato	NRC
	Richard Morante	BNL
	Joe Braverman	BNL
	Juliano De Grassi	BNL

Subject: REACTOR COOLANT SYSTEM, AND STRUCTERS TELECOMMUNICATION, OCTOBER 13, 2000

RCS - Clarifications on 4.3.8 Small Bore Piping and Small Bore Nozzles Inspections AMP

4. The small bore piping and small bore nozzles inspections AMP is described in LRA, Section 4.3.8. The applicant used a risk-informed approach based on ASME Code Case N-560 to select the most risk significant inspection locations. The applicant states that "As part of the risk-informed ISI program, ANO-1 has selected for volumetric examinations, a sample population of welds in the following Class 1 small bore piping: 1.5 inch pressurizer spray line, 2.5 inch makeup and purification lines, 2.5 inch letdown line, and 1.5 inch cold leg suction drain line". Clarify whether or not these examination zones are the small bore piping locations that were identified in the risk-informed ISI program documented in a letter dated June 3, 1998 and approved for the current license term or if this is a new program implemented especially for small bore piping and nozzles.

   The applicant will send a verification that the inspection activities in question are the small bore piping locations identified in the risk-informed ISI program documented in a letter dated June 3, 1998 and approved for the current license term.

5. If the program is an extension, as previously identified, of the risk-informed ISI program that was approved for the current licensing basis, (1) what aging effects were assumed in the risk-informed assessment of the small bore pining, and (2) what is the impact of 60 years of operation on the results of the risk-informed analysis.

   The applicant will provide a discussion explaining that there is no impact over 60 years because risk informed ISI looks at susceptibility and consequence and these factors do not change with time and would apply consistently over 60 years of operation.

Structural

RAI 3.3.6-3 As discussed in GALL, Table IIA.3, it is currently the staff position that hinges, locks and closure mechanisms of personnel hatches is in the scope of LR and

requires and AMR for pressure boundry intended function. IWE is identified as an acceptable AMP for LR. In addition, ANO-1 Tech Spec specifically addresses inspection frequency, scope, parameters monitored, inspection method, acceptance criteria, corrective action and operating experience. Potentially can credit for LR.

The applicant will review the staff's position and will provide a response after its assessment.

RAI 3.3.6-7b Clarify Entergy's response (forth sentence)with respect to in-leakage in areas other than the tendon gallery.

The applicant will provide a clarification that there is no other in-leakage.

RAI 3.3.6-7d On the basis of industry operating experience and the previous LR evaluations for CCNPP and ONS, the staff believes that aging of water stops can occur due aggressive chemicals in ground water, as well as, from general environmental conditions experienced by water stops, and aging management is needed.

The applicant needs to assess the staff's concern and consider providing some aging management that may include visual inspections during structural walk-downs, and the monitoring of ground water aggressive chemicals or a justification as to why ground water monitoring is not justified.

RAI 3.3.6-10 Entergy states that the concentrations of aggressive chemicals in ground waterr is below the threshold for degradation. On the basis of this determination, the applicant determined that inaccessible areas are no more susceptible to aging effects than accessible areas. Since ground water chemistry can change, a one-time measurement is not sufficient justification from excluding aging due to an absence of aggressive chemicals. It is also the staff position that an applicant cannot take credit for an AMP such as a ground water monitoring program to determine that an aging effect cannot occur. In addition, general environments of inaccessible areas if not the same as environmental condition of accessible areas can effect the aging in inaccessible areas for structural components. (Please refer to RAI 3.3.6-7d) The staff believes that an AMP that could include monitoring ground water and visual inspections of related components can provide sufficient aging management, but no AMP is not an acceptable conclusion.

The applicant will respond to this RAI and the previous RAI together.

RAI 3.3.6-11 NUREG 1557 is the industry agreed upon guidance for degradation of structural components. Therefore, discuss the technical basis for the statement "other potential aging effects and aging mechanisms do not apply to ANO-1 concrete components and commodities due to the absence of susceptible material and environmental conditions" with respect to the aging effects discussed in NUREG 1557.

RAI 3.3.6-13 Describe the “deficiencies” found during IWF inspections. Discuss the operating experience associated with Boric Acid degradation to adjacent structures and supports for systems other than the RCS.

The applicant will summarize the past finding associated with the IWF inspection activities associated with structures, and will summarize the operating experience associated with Boric Acid degradation of structures and supports adjacent to the RCS.

RAI 3.3.6-15 Discuss with Entergy the occurrence of rusting of exposed rebar, which is identified in the response to RAI 3.3.1.3-5. Discuss the technical basis for concluding that intended functions of concrete are not challenged by observed degradations (cracking, leaching, rebar exposure/rusting,water in-leakage).

The applicant will provide additional discussion relative to rusting of exposed rebar and its statement that the intended function of concrete are not challenged by the observed degradation discussed above.

RAI 3.3.6-16 Verify that the reference to “NUREG-1557" in this response is incorrect and should be “NUREG-1705" when referring to the Calvert Cliffs SER.

The applicant will send a verification that any referrence to the final Calvert Cliffs SER should refer to NUREG 1705 and will provide a comparison of its program with Reg 1.127.

RAI 3.3.6-18 The staff disagrees with Entergy’s reference to “relief requests” in defining the details of its IWL AMP and its IWF AMP because relief request are time-limited and will expire long before entering the period of extended operation.

The applicant verified that they did not intended imply that any relief request will restrict their compliance to code requirements during the period of extended operation if any of the current or future relief requests are not in place during the period of extended operation. They will provide a clarification that they will continue to comply with all applicable requirements of 10 CFR 50.55a as they apply during the period of extended operation.

RAI 3.3.6-19 Same issue as above. What does Entergy mean by “and NRC approved alternatives to ASME Section XI, Subsection IWE”? Is this a reference to relief requests?

The applicant will respond to this RAI and the previous RAI together.

RAI 3.3.6-20 Clarify whether the scope of the ANO-1 IWL AMP is identical to the scope of the ASME Section XI, Subsection IWL, Examination Categories L-A and L-B. Are all requirements of IWL and additions/modifications specified in 10 CFR 50.55a included in the AMP?

The applicant will provide a verification that its IWL AMP is identical to ASME Section XI, IWL requirements.

RAI 3.3.6-22 Verify that the ANO-1 IWF AMP includes the inspection for "loss of mechanical function", as defined in ASME Section XI, Subsection IWF. If not provide a technical justification.

The applicant will provide a verification that its IWF AMP is identical to ASME Section XI, IWF requirements.

RAI 3.3.6-23a Clarify the applicability of AMPs for managing degradation of threaded fasteners. Is the Boric Acid Corrosion Program credited? What AMP manages stainless steel threaded fasteners in raw water? Cannot find these listed in the tables.

The applicant will provide a clarification of the AMPs for managing degradation of threaded fasteners including stainless steel fasteners in raw water. Be sure to specify when the Boric Acid Corrosion Program as well as any other programs are credited with managing degradation of threaded fasteners.

RAI 3.3.6-23a Discuss with Entergy the ANO-1 plant-specific operating experience pertaining to local degradation of concrete around expansion and undercut anchors, including grout pad degradation. If not, provide a technical justification. What AMP is credited for managing the resulting aging effect (loss of anchor capacity)?

Entergy will provide a description of the 1997 structural walk-downs to verify that the degradation noted is addressed by the MR AMP.

RAI 4.6.1b Discuss with Entergy the basis for the prediction of 240 cycles over 60 years. 115 cycles have occurred over approx. 25 years, an average of 4 to 5 per year. In the RAI response, the statement "conservatively assuming three heatup-cooldown cycles per year" is made. There is ample margin on cycles even if 5 per year is assumed for the 60 year life (300 vs 500 design). What is the basis for 3 per year?

The applicant informed the that its basis for determining 3 cycles per year as a conservative value is because the applicant has had only 1 cycle per year over the past ten years and will document this basis.

<u>RAI</u> 3.3.6-4a In past LRA reviews, the staff determined that seals for containment personnel hatches and equipment hatches are within the scope of LR and subject to aging management review. GALL Chapter IIA.3 identifies IWE (Examination Category E-D) as an acceptable AMP. This can be augmented by App. J leak rate testing. However, Entergy has identified these programs as governing the replacement of containment hatch seals to meet the requirements under 10 CFR 54.21(a)(1)(ii). The SOC allows the use of performance and condition monitoring as a means of satisfying the requirements under 10 CFR 54.21(a)(1)(ii). In addition, the staff consumable position applies performance and condition monitoring as means of satisfying the requirements under 10 CFR

54.21(a)(1)(ii). However, in both application the applicant is required to identify and provide a site-specific technical justification for each application. The current information provided by the applicant is not sufficient for the staff to determine the seals in question as short lived.

The applicant will provide additional justification.

RAI 4.5-1 The staff's current acceptable basis for addressing the tendon prestress TLAA in accordance with 10 CFR 54.21(c)(1)(iii) is consistent with the basis given in Chapter X of GALL. Entergy's description of the ANO-1 TLAA for tendon prestress is incomplete with respect to the following attributes: monitoring and trending, and acceptance criteria, and additional information is needed.

The applicant will provide the additional information requested.

RAI 4.6-1a Discuss with Entergy the technical basis for the statement " Pressure cycling due to integrated leak rate testing is not applicable to cumulative fatigue." The sentences in the RAI response which follow this statement is not an adequate justification. A more specific and applicable technical basis needs to be provided.

The applicant will revise their response and remove any misleading statements. The applicant will provide the additional justification and will describe how these pressure loads are implicitly accounted for. The applicant will make the calculations discussed during the telecom available, and the staff will audit the calculations during its visit next week.