UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-8064

February 2, 2001

Craig G. Anderson, Vice President,
Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, Arkansas 72801-0967

SUBJECT: ARKANSAS NUCLEAR ONE - INSPECTION REPORT 50-313/00-17; 50-368/00-17 AND PUBLIC EXIT MEETING SUMMARY

Dear Mr. Anderson:

On December 20, 2000, the NRC completed an inspection at your Arkansas Nuclear One, Units 1 and 2, facility. The enclosed inspection report documents the inspection findings, which were discussed on December 20, 2000, with you and members of your staff, in an exit meeting open for public observation at the Arkansas Nuclear One site.

The purpose of this inspection was to confirm that the activities that support your application for a renewed license for Arkansas Nuclear One, Unit 1 were conducted consistent with that application. The inspection consisted of a selected examination of procedures and representative records, and interviews with personnel regarding the process of scoping and screening plant equipment to select equipment subject to an aging management review.

The inspection concluded that the scoping and screening portion of your license renewal activities for Unit 1 were conducted as described in your license renewal application and that documentation supporting your application is in an auditable and retrievable form. With the exception of the followup items identified in this report, your scoping and screening process was successful in identifying those systems, structures, and commodity groups required to be considered for aging management.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document

system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Linda Joy Smith, Chief
Project Branch D
Division of Reactor Projects

Docket Nos.: 50-313, 50-368
License Nos.: DPR-51, NPF-6

Enclosure: Inspection Report 50-313/00-17, 50-368/00-17

Attachments: (1) Supplemental Information
(2) Systems and Structures included in Scope
(3) NRC Public Exit Meeting Presentation

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Only inspection reports to the following:
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NRR Event Tracking System **(IPAS)**
ANO Site Secretary **(VLH)**

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RLNease	KWeaver	WMcNeill	RMullikin	CJulian
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02/01/01	02/02/01			

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos:	50-313, 50-368
License Nos:	DPR-51, NPF-6
Report No:	50-313/00-17, 50-368/0017
Applicant:	Entergy Operations, Inc.
Facility:	Arkansas Nuclear One, Units 1
Location:	Junction of Hwy. 64W and Hwy. 333 South Russellville, Arkansas
Dates:	December 11-20, 2000
Team Leader:	R. Nease, Acting Senior Project Engineer
Inspectors:	C. Julian, Technical Assistant, Region II R. Mullikin, Senior Reactor Inspector, Region IV W. McNeill, Reactor Inspector, Region IV K. Weaver, Resident Inspector, ANO H. Wang, Operations Engineer, NRR
Accompanying Personnel:	R. Prato, Project Manager, NRR
Approved By:	L. Smith, Chief, Projects Branch D Division of Reactor Projects

SUMMARY OF FINDINGS

Arkansas Nuclear One, Units 1 and 2
NRC Inspection Report No. 50-313/00-17, 50-368/00-17

IR 05000313-00-17, IR 05000368-00-17, on 12/11/2000 - 12/20/2000, Entergy Operations, Inc., Arkansas Nuclear One, Units 1 and 2. License Renewal Inspection Program, Scoping and Screening.

This inspection of license renewal activities for Unit 1 was performed by four Region IV inspectors, one Region II inspector, and two staff members from the Office of Nuclear Reactor Regulation. The team was onsite from December 11-15, 2000. The inspection was conducted in accordance with the guidance presented in NRC Manual Chapter 2516 and NRC Inspection Procedure 71002. This inspection did not identify any findings as defined in NRC Manual Chapter 0610*. During this inspection, the team identified two types of open items: (1) those pending team review of applicant commitments to correct or clarify the identified discrepancies, and (2) those issues which require additional NRC and/or team review to reach a conclusion.

The following open items are discrepancies identified by the team and are discussed in the body of this report. The applicant stated their intent to review these discrepancies and take appropriate actions to resolve them. The NRC will examine the results of these actions in a future inspection.

- Some of the engineering reports reviewed by the team were in the process of being revised at the time of this inspection. The applicant agreed to complete the draft revisions prior to the NRC's license renewal aging management inspection, during which the team will review them to verify that any changes which occurred subsequent to this inspection do not affect the conclusions documented in this report (Section II).

- The team identified an error in Table 2.2-1 of the applicant's license renewal application, in that the references listed were incorrect. The applicant agreed to issue a clarification letter to show the correct references (Section III.A.2).

- During walkdown of the emergency feedwater system, the team identified a rubber boot that was not identified as in being within the scope of license renewal. This rubber boot performs a function to demonstrate compliance with 10 CFR 50.48, "Fire Protection," therefore, it should be in the scope of the license renewal in accordance with 10 CFR 54.4(a)3. The applicant agreed to revise Engineering Report 1015-07, "Aging Management Review of Bulk Commodities," to identify this rubber boot and any others that may be installed in the plant, as a commodity subject to aging management (Section III.A.3).

- The team identified an inconsistency with how steam trap drains were treated with respect to license renewal scope, in that some were shown in the scope of license renewal, some were shown out of scope. The applicant determined that these steam traps should be screened out because they have an active function and their pressure boundary failure would not prevent the accomplishment of a safety function, in accordance with 10 CFR 54.4 and 54.21. The applicant agreed to correct the drawing (Section III.A.3).
- The continuation of the service water line to the circulating water discharge flume, Line JBD-15-18", found on Drawing M-209, Sheet 2, was not included in the applicant's scope

of license renewal. The applicant agreed to correct the drawing discrepancy to accurately show the continuation of line JBD-15-18" as being within their license renewal boundary (Section III.A.5).

- The circulating water discharge flume was incorrectly omitted from the license renewal scope and the applicant did not identify the flume as requiring an aging management review. The applicant agreed to include the flume in Engineering Report 93-R-1015-05, “Aging Management Review of the Emergency Cooling Pond and the Intake/Discharge Canals” (Section III.A.5).

- The team identified a symbol on boundary drawing LRA-M-210, Sheet 1, which was not defined. The applicant agreed to revise the drawing to correct the symbol (Section III.A.5).

- The team found that instrument air valves IA-823 and IA-824, which have a passive closed safety function to provide containment isolation, were omitted from the aging management review. The applicant agreed, and committed to revising Engineering Report 93-R-1016-25 to include them (Section III.A.10).

- The team found that the sensing line to valve CV-6062 was incorrectly shown on license renewal boundary drawing LRA -M-221 as being outside the license renewal boundary. The applicant agreed to correct this error in the next revision to the drawing (Section III.A.12).

- The team found that lube oil Valve 2PSV7132 was not shown on drawing LRA-M-2241, Sheet 1, “AAC Generator System Lube Oil System;” however, it was included in Engineering Report 93-R-1016-18, as being within the scope of license renewal for the lube oil system. The applicant determined that the valve was a lube oil system relief valve that had been removed as part of a recent modification, but Engineering Report 93-R-1016-18 had not been revised. The applicant agreed to revise Engineering Report 93-R-1016-18 to reflect the recent modification (Section III.B.1).

- Engineering Report 93-R-1015-01 does not treat the reactor building leak chase channels and the tendon conduits, consistently, with respect to the scope of license renewal. The applicant agreed to revise the report to correct this discrepancy (Section III.C.1).

- The team identified inconsistencies concerning the preferred source of water for the service water system. The applicant agreed to revise Engineering Report 93-R-1015-04 to clarify the preferred sources (Section III.C.2).

- The team found that the applicant had omitted station blackout and reactor protection system cables from their discussion, in Engineering Report 93-R-1010-01, of inscope components contained in the turbine building. The applicant agreed to revise this engineering report to specify the additional inscope components (Section III.C.4).
- Flamastic, which is used in fire protection barriers and wraps, was incorrectly omitted from Table 3.6-8 of the applicant’s license renewal application. The applicant agreed to correct the table by issuing a clarification letter to the NRC, and to revise Engineering Report 93-

R-1015-07, “Aging Management Review of Bulk Commodities,” to include flammastic (Section III.C.7).

The following open items, identified by the team, will be the subject of further NRC review. This review may require additional discussion with the applicant and exchange of correspondence between the applicant and the NRC staff for resolution.

- The piping for the flow and temperature instruments, which provide inputs to anticipated transient without scram mitigating system actuation circuitry to initiate emergency feedwater upon a low feedwater flow condition, must maintain system integrity for the instruments to perform their intended function to ensure that decay heat can be removed from the reactor. Therefore, the team found that the piping associated with these flow and temperature instruments was in the scope of license renewal and subject to aging management review. The applicant disagrees with this conclusion. This issue remains open pending receipt and NRC review of the applicant’s evaluations that demonstrate compliance with 10 CFR 50.62, “Anticipated Transients Without Scram” (Section III.A.4).

- Engineering Report 93-R-1010-01, "ANO-1 License Renewal Integrated Plant Assessment System and Structures Screening," was inconsistent with respect to the treatment of the emergency feedwater flow and temperature instruments. Specifically, the flow instruments, which supply inputs to anticipated transients without scram mitigating system activation circuitry to initiate emergency feedwater, were not designated as S or Q equipment, and were not in the license renewal scope; however, the temperature instruments were designated as S components and were in the license renewal scope. This item remains open pending further discussion with the applicant and selected review of the S list attached to Engineering Report 93-R-1010-01 (Section III.A.4).

- The team found that the intake canal bar grates were determined by the applicant to be outside the scope of license renewal. The team’s assessment of the applicant’s scoping and screening of the intake structure remains open pending NRC Office of Nuclear Reactor Regulation staff review of the applicant’s justification for excluding the bar grates (Section III.C.2).

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REPORT DETAILS

SYSTEM AND COMPONENT LEVEL SCOPING AND SCREENING

I. NRR Scoping and Screening Audit

By letter dated January 31, 2000, Entergy Operations, Inc. (the applicant) submitted to the NRC an application to renew the operating license for the Arkansas Nuclear One (ANO) Unit 1 to allow an additional 20 years of operation. As part of the review of the application, the NRR staff conducted a scoping and screening audit at the plant site in Russellville, Arkansas, from May 22-25, 2000. The purpose of the audit was to determine whether the scoping and screening methodology described in the applicant's license renewal application was developed and implemented in accordance with the requirements of 10 CFR Part 54 (the Rule) and with the applicant's license renewal application. The audit team determined that the development and implementation of the scoping and screening methodology was consistent with the Rule and with the applicant's license renewal application.

The results of this audit, issued May 1, 2000, and filed as accession number ML003711308, are available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

II. Scoping and Screening Inspection Scope

This inspection was conducted by NRC regional inspectors and a member of the NRR staff to verify, through sampling, that the applicant perfomed license renewal scoping and screening activities in accordance with the Rule and their license renewal application. A sample of systems, structures, and commodity groups from the applicant's license renewal application scoping results were selected for review. These system, structures, and commodity groups were chosen using risk insights, features unique to the plant, and operating history. In addition, certain systems, structures, and commodity groups were selected for review which were not included in the applicant's license renewal scope. The systems, structures, and commodity groups selected for review during this inspection are listed in Attachment 2 to this report.

For the selected systems, structures, and commodity groups, the team reviewed the results of the applicant's scoping and screening activities to verify that the list of components determined by the applicant to require evaluation for aging management was appropriate. The team reviewed the intended functions performed by these systems, structures, and commodity groups, the associated boundary drawings, and the applicant's list of active/passive and short/long lived components. In addition, the team reviewed supporting documentation and interviewed applicant engineers to confirm that the applicant's scoping and screening methodology was adequate for performing scoping and screening in accordance with the Rule.

The documents reviewed by the team are listed in Attachment 1 to this report. The team reviewed several engineering reports which were in the process of being revised at the time of this inspection. To differentiate between these "draft" engineering reports and reports that were completed and signed off, in Attachment 1, the term draft appears next to the revision number. The applicant committed to completing the draft revisions prior to the NRC's license renewal aging

management inspection. The team will review these completed engineering reports during the next license renewal inspection, scheduled for January and February of 2001, to verify that any changes which occurred subsequent to this inspection do not affect the conclusions documented in this report.

III. Inspection Findings

A. Evaluation of Scoping and Screening of Mechanical Systems

The applicant followed the process recommended in NEI 95-10, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule, " Revision 0. As part of their license renewal application for each of the mechanical systems, the applicant produced piping and instrumentation diagrams (P&IDs), hereinafter known as license renewal boundary drawings, which were color coded to show the portions of that system which were within the boundary or scope of license renewal. Using these license renewal boundary drawings, the applicant screened out certain components in accordance with 10 CFR Part 54. The team evaluated the applicant's scoping and screening process for mechanical components by reviewing selected plant systems that the applicant determined to be within the scope of license renewal. In addition, the team also reviewed several systems which were determined by the applicant to be outside the scope of license renewal. Results of these evaluations are discussed below, by system.

1. Atmospheric Vent System

a. Description

The atmospheric vent (AV) system was originally developed by the plant constructor (Bechtel) to vent various equipment to the atmosphere. This system is still in the plant equipment data base as a plant system, however, the valves in the system have either been deleted or reassigned to the systems being vented. The applicant concluded this system was not within the scope of the license renewal application.

b. Review

The team reviewed the applicable Final Safety Analysis Report (FSAR) sections, the applicant's design basis documents listed in Attachment 1, known as upper level documents (ULDs), license renewal boundary drawings, plant P&IDs, and engineering reports.

c. Conclusion

The team found that the applicant had performed scoping and screening for this system in accordance with the methodology described in their license renewal application.

2. Intermediate Cooling Water System

a. Description

The intermediate cooling water (ICW) system removes heat from various plant components. The ICW also provides a monitored barrier between the reactor coolant system and the service water system preventing direct contact between radioactive systems and the service water system. The systems and equipment supported by the ICW system include the:

- letdown coolers
- reactor coolant pump cooling water and seal return coolers
- pressurizer and steam generator sample coolers
- spent fuel pool coolers
- waste gas compressor aftercoolers
- isophase bus
- instrument air compressors and aftercoolers
- service air compressors and aftercoolers
- reactor coolant pump motor and lube oil coolers
- main feedwater pump lube oil coolers
- control rod drive cooling coils

The ICW system is composed of two independent, but interconnected closed cooling loops, consisting of heat exchangers, pumps, booster pumps, and surge tanks. During an emergency this system is isolated. The ICW system has no safety-related functions, in itself. However, some ICW components support reactor building isolation and, therefore, are within the scope of license renewal and subject to an aging management review. The following ICW components support the reactor building penetration isolation function and are subject to an aging management review:

- The ICW supply and return line isolation valves for the RCP motor and lube oil coolers that are needed to maintain reactor building integrity

- The ICW supply and return lines and isolation valves for the letdown cooler and RCP seal coolers

The intended function for these components in accordance with 10 CFR 54.21(a)(1) is to maintain pressure boundary integrity.

b. Review

The team reviewed the applicable FSAR sections, the applicant's design basis documents, known as ULDs, license renewal boundary drawings, plant P&IDs, and engineering reports listed in Attachment 1 to this report. The team identified an error in Table 2.2-1 of the applicant’s license renewal application. The listing for

ICW in Table 2.2-1 should identify Sections 2.3.2.7 (correctly identified) and 2.3.3.8 of the license renewal application. The reference to Sections 2.3.2.8 and 2.5 are incorrect. The applicant agreed to issue a clarification letter to show the correct references in this table.

c. Conclusion

The team concluded that the applicant performed scoping and screening for this system in accordance with the methodology described in their license renewal application. The team found a minor error in the license renewal application, which the applicant agreed to correct.

> Error in the License Renewal Application: The team identified an error in Table 2.2-1 of the applicant's license renewal application, in that the references listed were incorrect. The applicant agreed to issue a clarification letter to show the correct references.

3. Emergency Feedwater System

a. Decription

The emergency feedwater system (EFW) provides a safety-related backup source of feedwater to the steam generators to remove core decay heat and primary system residual heat from operational transient and accident conditions. The system consists of two trains and associated tanks, valves, and piping. One train includes an electric driven pump and the other includes a steam turbine-driven pump.

The intended function for aging management is pressure boundary integrity. The applicant determined that this system is in the scope of the Rule because it performs an intended function in accordance with 10 CFR 54.4(a)(1). The EFW discharge piping and valves, the EFW pumps, the safety-related portion of the recirculation lines, and the piping and valves in the discharge line up to the the EFW headers on the steam generators were determined by the applicant to be subject to an aging management review. The main steam supply valves and the steam supply piping are also included in this review.

b. Review

The team reviewed the applicable FSAR sections, the applicant's design basis documents known as ULDs, license renewal boundary drawings, P&IDs, and engineering reports listed in Attachment 1. In these documents, the team found numerous references to nonsafety-related sources of water to the Unit 1 EFW system, which were not indicated as being in the scope of license renewal on license renewal boundary drawings. For instance, the team found that the

following documents identify the Unit 1 nonsafety-related condensate storage tank (CST) as a source of water for the EFW system:

- Section 2.3.4.3 "Emergency Feedwater," of the applicant's license renewal application
- FSAR Section 10.4.8, "Emergency Feedwater System"
- Section 4.1 of ULD-1-SYS-12, "Emergency Feedwater System"
- Procedure 1203.012K, "Annunciator K12 Corrective Action"
- Procedure 060-00-0, "Emergency Feedwater Pump Operation"
- Section 2.3 of Calculation 89-0047-07, "ANO-1 Emergency Feedwater System"

In addition, the following documents identify the ANO-2 nonsafety-related CSTs as additional sources of water for the Unit 1 EFW system:

- Section 2.3.4.3 of the applicant's license renewal application, "Emergency Feedwater"
- Section 4.1 of ULD-1-SYS-12, "Emergency Feedwater System"
- Section 2.3 of probability risk analysis Calculation 89-0047-07, "ANO-1 Emergency Feedwater System"

The team questioned why these additional sources of EFW were not shown on the license renewal boundary drawings as being in the scope of license renewal. The applicant stated that the two safety-related sources of water for the EFW system, the Unit 1 safety-related CST and the service water system, were included in their license renewal scope and were adequate to assure safe shutdown. Therefore, the additional sources are not required to be in scope in accordance with 10 CFR 54.4(a). The team agreed.

During a walkdown of the EFW system, the team identified a rubber boot installed on the exhaust steam drain line, HBD-109-1, as it penetrated a curb surrounding the EFW turbine-driven pump. This component was not identified as being in the scope of license renewal, however the line on which it was installed was determined to be within the system's license renewal boundary. The purpose of this component was to maintain the integrity of the curb to contain spray from fire protection sprinklers and spilled oil, and is credited in the applicant's fire protection program. This rubber boot performs a function to demonstrate compliance with 10 CFR 50.48, therefore, it should be in the scope of license renewal in accordance with 10 CFR 54.4(a)3. The applicant agreed to revise Engineering Report 1015-

07, “Aging Management Review of Bulk Commodities,” to identify this rubber boot, and any others in the scope of license renewal that may be installed in the plant, as a commodity subject to aging management.

The team identified an inconsistency with how steam trap drains were treated with respect to license renewal scope. Specifically, steam Traps 129 and 130 are shown on license renewal boundary drawing LRA-M-204, "EFW Pump Turbine," Sheet 6, as being within the license renewal boundary. However, steam Trap 79 on license renewal boundary drawing LRA-M-206, "Steam Generator Secondary System," Sheet 1, is shown as outside of the boundary. The applicant determined that these steam traps should be screened out, because they have an active function and their pressure boundary failure would not prevent the accomplishment of a safety function, in acordance with 10 CFR 54.4 and 54.21.

c. Conclusion

The team found that, with the exception of the minor discrepancies noted below, the applicant performed scoping and screening for this system in accordance with the methodology described in their license renewal application.

Plant Walkdown Observation - Rubber Boot: During walkdown of the EFW system, the team identified a rubber boot that was not identified as being in the scope of license renewal. This rubber boot performs a function to demonstrate compliance with 10 CFR 50.48, therefore, it should be in the scope of license renewal in accordance with 10 CFR 54.4(a)3. The applicant agreed to revise Engineering Report 1015-07, “Aging Management Review of Bulk Commodities,” to identify this rubber boot and any others in the scope of license renewal that may be installed in the plant, as a commodity subject to aging management.

License Renewal Boundary Drawing LRA-M-204 Discrepancy: The team identified an inconsistency with how steam trap drains were treated with respect to license renewal scope, in that some were shown in the scope of license renewal and one was not. The applicant determined that these steam traps should be screened out, because they have an active function and their pressure boundary failure would not prevent the accomplishment of a safety function, in acordance with 10 CFR 54.4 and 54.21. The applicant agreed to correct the drawing.

4. Main Feedwater System

a. Description

The main feedwater system (MFW) provides feedwater to the steam generators for normal operation of the plant. The system's safety-related functions are to isolate the feedwater during a main steam line break and during a MFW line break. These

functions are accomplished by closing the MFW isolation valves. The MFW system consists of two trains of turbine-driven pumps, one auxiliary feedwater pump, two high pressure heaters, pump lube oil system, and associated valves and piping. The safety-related portion of the MFW includes the piping from the MFW isolation valves to the steam generators. The MFW flow and temperature instruments are located in the nonsafety-related portion of the MFW, upstream of the MFW isolation valves. These flow and temperature instruments are used as input to the anticipated transients without scram (ATWS) mitigation system actuation circuitry (AMSAC). The primary function for aging management is pressure boundary integrity. The applicant determined that the safety-related portion of the MFW system from the MFW isolation valves to the steam generators was in the scope of the Rule and subject to an aging management review.

b. Review

The team reviewed the applicable FSAR sections, the applicant's design basis documents, known as ULDs, boundary drawings, plant P&IDs, and applicable engineering reports listed in Attachment 1. The MFW isolation valves perform the following two functions: (1) to prevent steam generator blow down on a MFW line break, and (2) to isolate feedwater flow to the steam generator on a steam line break. The MFW isolation check valves found on the steam generator side of the MFW isolation valves provide a backup to the MFW isolation valves to prevent steam generator blow down upon a MFW line break. These valves and the associated piping are safety related, and were determined to be within the scope of license renewal and subject to an aging management review. The control valves and the block valves on the main feedwater pump side of the MFW isolation valves serve as backups to the MFW isolation valves to isolate MFW in the event of a main steamline break. These valves and their associated piping are not safety related. The MFW isolation function of these valves require moving parts to perform their function and, therefore, the control and block valves are not subject to an aging management review in accordance with 10 CFR 54.21(a)(1)(i). Furthermore, the failure of the control and block valve bodies and associated piping would not prevent the satisfactory accomplishment of a safety function, because their failure would interrupt feedwater flow to the steam generators. The team agreed with the applicant’s conclusion that the block and control valves were not in the scope of the Rule.

The team reviewed Upper Level Document, ULD-1-13, "ANO-1 Main Feedwater System," and identified that certain flow and temperature instruments (FE-2627, FE-2677, TE-2629, TE-2630, TE-2679 and TE-2680) are required to support a "safety significant function,” in that they provide inputs to AMSAC to initiate EFW upon a low feedwater flow condition to ensure that decay heat can be removed from the reactor. License renewal boundary drawing, LRA-M-206, Sheet 1, "Steam Generator Secondary System," showed the license renewal boundary of the MFW system to be the safety-related portion of MFW system from the MFW isolation valves to the steam generators. These flow and temperature instruments are

installed on the nonsafety-related portion of the MFW system, which was outside of the license renewal boundary. The applicant explained that although these flow and temperature instruments perform an intended function described under 10 CFR 54.4(a)(3), they can be screened out in accordance with 10 CFR 54.21 as active components. Section 54.4(a)(3) of the Rule requires all systems relied on to perform a function that demonstrates compliance with the regulations for ATWS be in the scope of the Rule. The team found that the piping to which the flow and temperature instruments are installed must maintain system integrity for the instruments to perform their intended function. If, during an ATWS event, the piping downstream of the flow instruments developed a break, the flow instruments would provide a false indication of high feedwater flow to AMSAC, preventing initiation of EFW, if needed. Therefore, the team found that the piping associated with the flow instruments downstream of the instruments was in the scope of license renewal and subject to aging management review. The applicant disagrees with this conclusion. This issue remains open pending receipt and NRC review of the applicant's evaluations that demonstrate compliance with 10 CFR 50.62, "Anticipated Transients Without Scram."

In reviewing, Attachment 9, "Component Database Printout of Q and S Equipment," to Engineering Report 93-R-1010-01, "ANO-1 License Renewal Integrated Plant Assessment System and Structures Screening," the team noted that EFW flow elements FE-2627 and FE-2677, were not listed as either S or Q components. In addition, the team noted that EFW temperature elements TE-2629, TE-2630, TE-2679 and TE-2680 were listed as S components. Since the temperature elements provide a correction to the flow indications and the flow and temperature instruments are located on the same EFW line, the team questioned the applicant regarding this apparent inconsistency. Furthermore, the report did not identify the flow instruments as being within the scope of license renewal, but did identify the temperature instruments as being in the scope. This item remains open pending further discussion with the applicant and selected review of the S list attached to Engineering Report 93-R-1010-01.

c. Conclusion

The team found that with the exceptions noted below, the applicant performed scoping and screening for this system in accordance with the methodology described in their license renewal application.

> MFW Flow and Temperature Instrument Piping: The piping for the flow and temperature instruments, which provide inputs to AMSAC to initiate EFW upon a low feedwater flow condition, must maintain system integrity for the instruments to perform their intended function, to ensure that decay heat can be removed from the reactor. Therefore, the team found that the piping associated with these flow and temperature instruments was in the scope of license renewal and subject to aging management review. The applicant disagrees with this conclusion. This issue remains open pending receipt

and NRC review of the applicant's evaluations that demonstrate compliance with 10 CFR 50.62, "Anticipated Transients Without Scram."

Inconsistent Treatment of Flow and Temperature Instruments: Engineering Report 93-R-1010-01, "ANO-1 License Renewal Integrated Plant Assessment System and Structures Screening," was inconsistent with respect to the treatment of the EFW flow and temperature instruments. Specifically the flow instruments, which supply inputs to AMSAC to initiate EFW, were not designated as S or Q equipment, and were not in the license renewal scope; however, the temperature instruments were designated as S components, and were in the license renewal scope. This item remains open pending further discussion with the applicant and selected review of the S list attached to Engineering Report 93-R-1010-01.

5. Service Water System

a. Description

The service water (SW) system consists of two loops with three SW pumps, and provides cooling water from Lake Dardanelle or the emergency cooling pond to cool safety-related and nonsafety-related equipment. The safety function of the SW system is to transfer heat from safety-related components to Lake Dardanelle or the emergency cooling pond. The safety-related SW system is also a source of emergency cooling water to the EFW system and the spent fuel pool. The SW system is credited in the fire analysis, therefore necessary to meet the requirements of 10 CFR 50.48.

During normal operation, the SW system supplies cooling water to nonessential cooling loads, and under accident conditions, isolates cooling water to these nonessential cooling loads. The intended function for aging management is to maintain SW system pressure boundary integrity. The safety-related heat exchangers have the required function of heat transfer. The applicant concluded that all long-lived, safety-related components and piping in the SW system are included in the scope of the Rule, and subject to an aging management review.

b. Review

The team reviewed the applicable FSAR sections, the applicant's design basis documents, known as ULDs; license renewal boundary drawings, plant P&IDs; and engineering reports.

The team questioned whether the licensee had developed adequate technical basis to support terminating the SW license renewal boundary shown on LRA-M-210 , Sheet 1, at a flange with a flow orifice, rather than completing the flow path through the discharge flume line. The licensee agreed to include the SW piping

from the flow orifice to the discharge flume and the flume itself in their license renewal scope.

Specifically, license renewal boundary drawing LRA-M-210, Sheet 1, "Service Water," refers to Drawing “M-209,” for continuation of the circulating water discharge flume line, JBD-15-18". Line JBD-15-18" does not appear on license renewal boundary drawing LRA-M-209, Sheet 1; however, line JBD-15-18" appears on drawing M-209, Sheet 2, which is not a license renewal boundary drawing. Therefore, line JBD-15-18" was not included in the applicant’s scope of license renewal. The applicant agreed to correct the drawing discrepancy to accurately show the continuation of Line JBD-15-18" as being within their license renewal boundary.

The team found that the applicant did not discuss the flume in the scoping and screening section of their license renewal application, nor did they identify the flume as requiring an aging management review. The applicant agreed to include the flume in Engineering Report 93-R-1015-05, “Aging Management Review of the Emergency Cooling Pond and the Intake/Discharge Canals.”

In addition, the team identified a minor drawing error on boundary drawing LRA-M-210, Sheet 1. A symbol was drawn incorrectly, and the applicant agreed to revise the drawing to correct the symbol.

c. Conclusion

The team found that, with the exceptions noted below, the applicant had performed scoping and screening for this system in accordance with the methodology described in their license renewal application.

Part of the SW Discharge Line Omitted from the License Renewal Scope: The continuation of the service water line to the circulating water discharge flume, Line JBD-15-18", found on Drawing M-209, Sheet 2, was not included in the applicant’s scope of license renewal. The applicant agreed to correct the drawing discrepancy to accurately show the continuation of Line JBD-15-18" as being within their license renewal boundary.

Circulating Water Discharge Flume: The circulating water discharge flume was incorrectly omitted from the license renewal scope and from aging management review. The applicant agreed to include the flume in Engineering Reports 93-R-1015-05.

Minor Boundary Drawing Discrepancy: The team identified a symbol on boundary drawing LRA-M-210, Sheet 1, which was not defined. The applicant agreed to revise the drawing to correct the symbol.

6. Low Pressure Injection/Decay Heat Removal System

a. Description

The low pressure injection/decay heat removal system is a dual-purpose system. This system operates as the decay heat removal (DHR) system to remove heat energy from the reactor coolant system (RCS) during the latter stages of a plant cooldown and operates in a steady state to remove decay heat from the reactor core during plant shutdown conditions. The low pressure injection (LPI) mode of system operation injects borated water into the reactor vessel to cool the core in the event of a loss of coolant accident (LOCA). The LPI system is an emergency core cooling system that provides large volumes of borated water at low pressure into the reactor vessel to mitigate a large sized LOCA. The LPI system is described in FSAR, Sections 6.1.3.2 and 6.1.2.1.2, while the DHR system is described in FSAR, Section 9.5.

The LPI system performs the following safety functions:

- Injects borated water into the reactor vessel from the borated water storage tank (BWST) during a postulated large break LOCA.

- Provides long-term cooling of the reactor core following a LOCA by recirculating injection water from the reactor building floor sump, cooling it and returning it to the reactor vessel. The BWST water floods the reactor building basement to a level that will allow for recirculation of the water from the reactor building sump under accident conditions.

- Supplies recirculated water from the reactor building sump to the suction of the high pressure injection pumps if RCS pressure is too high to allow the LPI pumps to inject water into the reactor vessel.

The DHR system performs the following safety functions:

- Removes decay heat from the reactor core and sensible heat from the RCS during the latter stages of cooldown, such that fuel design limits and design conditions of the RCS pressure boundary are not exceeded.

- Circulates reactor coolant during shutdown conditions to prevent boron stratification and to minimize the effects of a boron dilution event.

- Provides an alternate supply of borated water from the BWST for volume contraction during cooldown to cold shutdown.

b. Review

The team reviewed Engineering Report, 93-R-1016-10, "Aging Management Review of the Decay Heat/Low Pressure Injection System," to confirm the system functions. The design basis document, ULD-1-SYS-04, "Decay Heat Removal/Low

Pressure Injection System," was reviewed to determine the system design characteristics. License renewal boundary drawing LRA-M-232, "Decay Heat Removal System," was examined to determine what part of the system was in the scope of license renewal. The drawing indicated that all portions of the LPI/DH system necessary to perform its safety functions were in the scope of license renewal.

c. Conclusion

The team concluded that the applicant had performed license renewal scoping and screening of this system in accordance with the methodology described in their license renewal application.

7. High Pressure Injection/ Makeup and Purification System

a. Description

The high pressure injection/makeup and purification system is a dual function system with two operating modes. The safety function of the high pressure injection (HPI) system is to provide high pressure borated water flow into the RCS during emergency conditions. The HPI system is an emergency core cooling system that provides relatively small volumes of borated water at high pressure into the reactor vessel to mitigate a small break LOCA. The system is normally operated in the makeup and purification system (MUP) mode. The MUP system continuously diverts a portion of the RCS for filtering and purification, then returns it to the RCS to maintain desired RCS water chemistry. The HPI system is described in FSAR, Sections 6.1.2.1.1 and 6.1.3, while the MUP system is described in FSAR, Section 9.1.

The HPI system performs the following safety functions:

- Injects borated water from the BWST during postulated accidents, such as small break LOCA.

- Provides long-term cooling following small break LOCAs by recirculating injection water from the reactor building sump and returning it to the reactor vessel.

The MUP system mode supports the following safety functions:

- Provides an increase in inventory to the RCS during operational transients such as reactor trips and overcooling events.

- Provides a backup inventory supply to the RCS during a loss of decay heat removal event.

- Provides core cooling following a total loss of feedwater event via feed and bleed cooling of the RCS.

- Provides an auxiliary means to spray the pressurizer steam space when normal spray is not available.

b. Review

The team examined license renewal boundary drawing LRA-M-231, "Piping and Instrumentation Diagram Makeup & Purification System," Sheets 1, 2, & 3. The team found that all portions of the system necessary to perform the system safety functions were shown on the boundary drawing as being in the scope of license renewal. The team reviewed Engineering Report 93-R-1016-08, "Aging Management Review of the Makeup and Purification / High Pressure Injection System," to confirm the system safety functions. The team also reviewed design basis document, ULD-1-SYS-02, "ANO-1 Makeup and Purification/High Pressure Injection System," to determine the system engineering design basis.

c. Conclusion

The team concluded that the applicant had performed license renewal scoping and screening of this system in accordance with the methodology described in their license renewal application.

8. Reactor Building Cooling and Purge System

a. Description

The reactor building cooling and purge system is described in Section 5.2.6 of the FSAR. The safety function of the reactor building cooling system is to reduce the postaccident pressure and temperature in the reactor building and provide mixing of the reactor building atmosphere following a LOCA. During normal plant operation, the system must maintain reactor building temperature below the maximum allowed for the equipment, and below accident analyses initial temperature assumptions. The reactor building purge has no safety function; however, the reactor building penetrations in this system must maintain reactor building integrity under accident conditions.

b. Review

The team examined boundary drawing P&ID LRA-M-261, "Piping and Instrumentation Diagram Reactor Building H.V.A.C.," Sheets 1 & 2. The drawing showed that the four safety-related reactor building coolers, their service water

cooling coils, the fan/cooler housings and the discharge duct work, including the duct relief valves that prevent damage to the duct work during a rapid building pressurization, were in the scope of license renewal. The reactor building inner and outer isolation valves and connecting piping of the reactor building purge system at the two reactor building penetrations were also in the scope of license renewal.

c. Conclusion

The team concluded that appropriate portions of the system were designated as being in the scope of license renewal, and that the applicant had performed license renewal scoping and screening of this system in accordance with the methodology described in their license renewal application.

9. Auxiliary Building Sump and Reactor Building Drains

a. Description

The auxiliary building sump and reactor building drain systems consist of the floor and equipment drains, piping, valves, sumps, and tanks that collect potentially radioactive liquids from the reactor and auxiliary buildings for processing or disposal. The following are the safety-related functions of the auxiliary building sump and reactor building drains.

- Reactor building penetrations isolate to contain the radioactivity within the reactor building following a LOCA. The penetrations are for the reactor building sump and reactor building drain systems.

- The screens on the reactor building sump and floor drains prevent debris from entering the reactor building sump and interfering with water recirculation post LOCA.

- The anti-vortex device on the reactor building sump prevents vortexing that could occur under accident conditions when the reactor building is flooded and recirculation of the reactor building water is underway. The anti-vortex device is part of the reactor building sump system.

- The decay heat pump room drains and isolation valves ensure that the radioactive liquids which could be present in the decay heat removal pump rooms following a LOCA do not escape to other portions of the auxiliary building. These drains are in the auxiliary building sump system.

- The reactor coolant pump motor oil leakage collection tanks, piping, and valves collect oil leakage from the reactor coolant pump motors in order to reduce the chance of a fire. This function is not safety related, but is

required by fire protection regulation 10 CFR 50.48, to prevent a fire inside the reactor building involving leaking oil.

The applicant determined that, with respect to the auxiliary building sump and reactor building drains, the following were in the scope of license renewal:

- Mechanical components associated with reactor building penetrations that are required for reactor building isolation.

- The reactor building sump inlet and anti-vortexing screen and individual screens on the floor drains that drain into the reactor building sump that prevent debris from entering the sump.

- The concrete sump and the structural steel for the sump including the screen structural steel supports and sump divider plate which were evaluated by the applicant as structural components.

- Valves and piping that isolate the decay heat pump rooms, which are credited as part of the room pressure boundary for offsite dose calculations.

- The reactor coolant pump motor oil leakage collection tanks and piping that are specifically required by 10 CFR 50.48 for fire protection.

b. Review

The team reviewed the following license renewal boundary drawings:

- P&ID LRA-M-213, "Dirty Radioactive Waste Drainage & Filtration," Sheet 1

- P&ID LRA-M-213, "Laundry Waste and Containment & Aux Building Sump Drainage," Sheet 2

- P&ID LRA-M-214, "Clean Liquid Radioactive Waste," Sheet 3

To better understand the equipment construction and function, the team also examined the following plant drawings:

- 7-DH-17, "Large Pipe Isometric Decay Heat Pump Suction From Reactor Building Sump," Sheet 1

- C-97, "Reactor Building Sump Screen," Sheet 1

From this drawing review and from discussion with applicant engineers the team observed that only certain portions of the auxiliary building sump and reactor building drain system components were determined by the applicant to be within

the scope of license renewal. The check valves in auxiliary building penetration room floor drains were in scope, because they allow the ventilation system to maintain a slight vacuum in the rooms. The team questioned why drain piping was not in the scope of license renewal, and the applicant's representatives stated that the plugging or leaking of any single drain will not prevent a safety function. The team agreed.

The team found that the applicant identified the appropriate set of components from these systems to support safety functions and correctly determined which of these should be in the scope of license renewal.

c. Conclusion

The team concluded that the applicant had performed license renewal scoping and screening of this system in accordance with the methodology described in their license renewal application.

10. Instrument Air

a. Description

The instrument air system is designed to provide a reliable supply of dry, oil-free, compressed air for pneumatic instrument and valve operation. Although the majority of the instrument air system is not safety related, some safety-related components utilize instrument air for operation of their pneumatic actuators.

The applicant reviewed the components of the instrument air system and components in other systems that utilize instrument air and determined that many components that utilize instrument air are designed to fail to the desired postaccident condition upon loss of air supply; therefore, the integrity of the instrument air pressure boundary is not required. As an exception, the applicant determined that pressure boundary integrity is required for the following components, which were also determined by the applicant to be subject to an aging management review.

- The portions of the instrument air system that are part of the reactor building penetration for the instrument air supply to the reactor building. Pressure boundary integrity of these components is required for the penetration to perform its intended function.

- The portions of the instrument air system between the air accumulator and the actuator for the intermediate cooling water supply valve for the reactor coolant pump motor air and lube oil coolers. This valve provides reactor building isolation and requires air pressure to reposition. An accumulator is provided in the event of a loss of instrument air. Pressure boundary

integrity of the accumulators and components between the accumulators and the valve actuators is required.

- The portions of the instrument air system between the air accumulator and the actuator for the intermediate cooling water supply and return valves for the letdown coolers and reactor coolant pump seal coolers. These valves provide reactor building isolation and require air pressure to reposition. Accumulators are provided in the event of a loss of instrument air.

- Carbon dioxide bottles and the portion of the system from the carbon dioxide bottles to the valve actuators for the outside air dampers for the two emergency fan filter units in the control room ventilation system. These dampers have a function to reposition.

b. Review

The team reviewed the license renewal boundary drawings, relevant FSAR sections, and supporting documentation. In addition, the team walked down portions of the instrument air system to verify correctness of the associated drawings provided in the license renewal application. The team found that the applicant had appropriately identified the components and their functions that were subject to aging management with the exception of two instrument air valves: Valves IA 823, and IA 824 (the outboard and inboard isolation check valves for the air supply to Reactor Building Purge Valves CV-7403 and CV-7404). These instrument air valves were identified in the applicant's ASME Section XI inservice testing program as having a passive closed safety function to provide containment isolation. The applicant stated that these valves were inadvertently omitted from the aging management review and would be included in the next revision to Engineering Report 93-R-1016-25, "Aging Management Review of the Instrument Air Components."

c. Conclusion

The team concluded that, with the exception noted below, the applicant had performed scoping and screening for this system in accordance with the methodology described in their license renewal application.

Instrument Air Valves not Subject to Aging Management Review: The team found that instrument air valves IA-823 and IA-824, which have a passive closed safety function to provide containment isolation, were inadvertently omitted from the aging management review. The applicant agreed, and committed to including them in the next revision to Engineering Report 93-R-1016-25.

11. Plant Computer

a. Description

The applicant determined that the plant computer did not provide or perform any intended function as described in the Rule, therefore, was excluded from the scope of license renewal.

b. Review

The team reviewed the Unit 1 System Training Manual STM 1-61, “Plant Computer and Plant Monitoring System,” and electrical Drawing E-481, “Connection Schedule Computer Analog Inputs,” Revision 2, and interviewed personnel concerning the plant computer system.

c. Conclusion

The team concluded that the applicant’s determination of excluding the plant computer from the scope of license renewal was appropriate, and in accordance with the scoping methodology described in the license renewal application.

12. Chilled Water System

a. Description

The chilled water systems provides chilled water to cooling coils of several room and area ventilation units. The auxiliary building electrical room emergency chillers are the only safety-related chillers within the scope of license renewal. These two emergency chillers have the safety function to supply chilled water for emergency cooling of the safety-related electrical equipment located in the auxiliary building electrical equipment rooms.

The two auxiliary building electrical room emergency chillers, the internal surfaces of the six cooling coils supplied by the chillers, and the associated valves and piping were determined by the applicant to be subject to an aging management review. In addition, the main chilled water system reactor building penetrations, piping, and valves were included in the scope of the license renewal since they provide the safety function to maintain reactor building integrity under accident conditions.

b. Review

The team reviewed license renewal boundary drawing LRA-M-221, “Emergency Chilled Water System Auxiliary Building Electrical Rooms.” relevant FSAR sections, the applicant's design basis documents, known as ULDs, plant P&IDs, and license renewal engineering reports. The team compared the plant P&IDs for the chilled water system with license renewal boundary drawing LRA-M-221. In addition, the team walked down portions of the chilled water system, which included the

auxiliary building electrical room emergency chillers, to verify that the as-built configuration was accurately reflected in the license renewal boundary drawing.

The team found that the sensing line to temperature control Valve CV-6062 for the auxiliary building electrical switchgear room emergency chiller VCH-4B was shown on license renewal boundary drawing LRA -M-221 as being outside the license renewal boundary. The applicant stated that this line should have been included in the scope of the license renewal, because it supports a safety-related function in accordance with 10 CFR 54.4(a)(1). The applicant agreed to correct this error in the next revision to the drawing.

c. Conclusion

The team found that with the exception noted below, the applicant had appropriately identified the components and their functions that were subject to aging management and had performed scoping and screening for this system in accordance with the methodology described in the license renewal application.

License Renewal Boundary Drawing Discrepancy: The team found that the sensing line to Valve CV-6062 was incorrectly shown on license renewal boundary drawing LRA -M-221 as being outside the license renewal boundary. The applicant agreed to correct this error in the next revision to the drawing.

B. Evaluation of Scoping and Screening of Electrical Systems

1. The applicant treated all electrical systems together as one system for the purposes of performing license renewal scoping and screening activities. The team selected several electrical systems to review to verify if the applicant performed license renewal scoping and screening activities in accordance with their license renewal application.

a. Description

The applicant used a combination of the plant spaces and commodity grouping approaches listed in the Sandia National Laboratory Report, “Aging Management Guideline for Commercial Nuclear Power Plants - Electrical Cable and Terminations.” Commodity grouping was used so that component types not in the scope of license renewal could be eliminated from consideration. The plant spaces method involved identifying areas in the plant exposed to significant aging stressors, and then analyzing the passive electrical components in those areas.

The Sandia report concluded that careful consideration was only required for those passive electrical components which are: (1) located near heat and/or radiation sources (including hot spots), (2) subject to continuous or near continuous loading at a significant percentage of the cable ampacity limits, (3) exposed to wetting (medium voltage only) or adverse chemical environments, or (4) subject to repeated or damaging mechanical stress. Low voltage instrument cables that are sensitive to small variations in impedance were also determined to be adversely affected by oxidation of connector or termination contacts. The Sandia report also recommended special consideration be given to the possibility of installation damage of cables and electrical equipment. Heat stress/thermal aging can cause accelerated aging for some passive electrical components and is primarily a concern for cable insulation. The Sandia report recommended the identification of a service limiting temperature threshold that does not exceed the 60-year service limiting temperature applicable to the materials of concern. For ANO-1, temperature thresholds of 105°F outside of the reactor building and 120°F inside the reactor building were chosen to be consistent with the ambient temperature assumptions of the ANO-1 equipment qualification program.

b. Review

The team reviewed the applicant's license renewal application for the scoping and screening criteria used by the applicant for 4.16 KV switchgear, 120 VAC instrument, 120 VAC, 125 VDC, 480V load centers, emergency diesel generator system, and the alternate ac diesel generator system.

Passive Electrical Components: The applicant documented their review of passive electrical components in the scope of license renewal in the following engineering reports:

- ER 93-R-1017-01 Aging Management Review of the Passive Electrical Components
- ER 93-R-1017-02 ANO-1 License Renewal Screening of Ohmic Heating in Power Cables
- ER 93-R-1017-03 ANO-1 License Renewal Screening of Power Cables Potentially Subject to Wetting
- ER 93-R-1017-04 ANO-1 License Renewal Screening of Frequently Manipulated Cables & Terminations
- ER 93-R-1017-05 ANO-1 License Renewal Screening of Cables and Terminations Exposed to Potentially Hazardous Chemicals

- ER 93-R-1017-06 ANO-1 License Renewal Screening of Impedance Sensitive Circuits
- ER 93-R-1017-07 ANO-1 License Renewal Screening of Cables Exposed to High Radiation
- ER 93-R-1017-08 ANO-1 License Renewal Screening of Cables Outside Containment Exposed to Elevated Temperatures
- ER 93-R-1017-09 ANO-1 License Renewal Screening of Cables Inside Containment Exposed to Elevated Temperatures
- ER 93-R-1017-10 ANO-1 License Renewal Screening of Electrical Connections

In these reports, the applicant identified the component types considered in the scope of license renewal using the Sandia plant spaces and commodity grouping approaches. These reports also identified the passive electrical components in the scope of license renewal that were exposed to the significant stressors identified in the Sandia report. Finally, the applicant performed plant walkdowns to identify localized hot spots.

The applicant evaluated passive electrical components in the portions of the reactor building where the ambient temperature is above the 120°F license renewal threshold or the high radiation threshold value. The auxiliary building and intake structure are controlled environments that are mostly benign spaces for the passive electrical equipment in the scope of license renewal. For the few areas in the auxiliary building that have equipment temperatures above the 105°F threshold value, the applicant evaluated the passive electrical components in these areas. Therefore, using the plant spaces approach and the Sandia selection of significant stressors, the applicant determined that only the following subsets of passive electrical components within the scope of license renewal required component specific evaluation:

- Passive electrical equipment in elevated temperature locations in the auxiliary building, turbine building, intake structure, and the reactor building (including hot spots)
- Passive electrical equipment in areas of the reactor building that are above the threshold radiation level
- Wetted medium voltage power cables and any cables exposed to potentially hazardous chemicals
- Power cables loaded to a significant fraction of their ampacity rating

- Cables and connectors subject to frequent manipulation

- Low voltage instrument cables that operate at low currents or are otherwise sensitive to small variations in impedance

In addition, conduit supports, cable trays and their supports, and cabinets, electrical panels and their supports, were determined by the applicant to be bulk commodities and subject to an aging management review.

AC Diesel Generator and Emergency Diesel Generator: The applicant also included in the scope of license renewal the alternate ac diesel generator and the emergency diesel generator systems and their components. The description of the applicant's scoping and screening criteria is provided in Engineering Reports 93-R-1016-07, "Aging Management Review of the Emergency Diesel Generator System," and 93-R-1016-18, "Aging Management Review of the Alternate AC Generator System." In reviewing the alternate ac diesel generator license renewal boundary drawing LRA-M-2241, "AAC Generator System Lube Oil System," Sheet 5, the team found that Valve 2PSV7132 was not shown on LRA-M-2241; however, it was included in Engineering Report 93-R-1016-18, "Aging Management Review of the Alternate AC Generator System," as being within the scope of license renewal for the lube oil system. The applicant subsequently determined that Valve 2PSV7132 was a lube oil system relief valve that had been removed as part of a recent modification. As a result of this modification, LRA-M-2241 had been revised but Engineering Report 93-R-1016-18 had not been. The applicant agreed to revise Engineering Report 93-R-1016-18 to reflect the recent modification.

c. Conclusion

The team determined that the applicant had performed scoping and screening in accordance with their license renewal application, with the following exception:

Engineering Report 93-R-1016-18 Discrepancy: The team found that lube oil relief Valve 2PSV7132 was not shown on license renewal boundary drawing LRA-M-2241; however, it was included in Engineering Report 93-R-1016-18 as being within the scope of license renewal for the lube oil system. The applicant determined that the valve was a lube oil system relief valve that had been removed as part of a recent modification, but Engineering Report 93-R-1016-18 had not been revised. The applicant agreed to revise Engineering Report 93-R-1016-18 to reflect the recent modification.

C. Evaluation of Scoping and Screening of Structural Components

1. Reactor Building

a. Description

The reactor building is a composite structure consisting of a posttensioned reinforced concrete structure with cylindrical wall, a shallow dome roof, and a flat conventional reinforced foundation mat. The reactor building completely encloses the reactor and the associated reactor coolant system along with other electrical, mechanical, and structural components. The entire structure is internally lined with a carbon steel liner plate to assure a high degree of leak tightness. The applicant determined that the reactor building and its structural components perform the following functions:

- Provide essentially leak tight barriers to prevent uncontrolled release of radioactivity
- Provide structural support or functional support to safety-related systems, structures, and components. Specifically, for the posttensioning systems, this function means to impose compressive force on the concrete reactor building structure to resist, with no loss of structural integrity, the internal pressure resulting from a design basis accident
- Provide shelter or protection to safety-related equipment (including radiation shielding)
- Provide rated fire barriers to confine or retard a fire from spreading to or from adjacent areas
- Serve as external missile barriers
- Provide structural or functional support to nonsafety-related equipment, failure of which could directly prevent satisfactory accomplishment of required safety-related functions
- Provide a heat sink during design basis accidents or station blackout conditions

The applicant determined that the entire reactor building, including the concrete dome, walls, floor, foundation slab, liner plate, steel attachments to the liner plate, fuel transfer tube, posttensioning system, and the hatches and penetrations are within the license renewal scope.

b. Review

The team reviewed the following engineering reports:

- 93-R-1015-01, “Aging Management Review of the Reactor Building”

- 93-R-1010-01, “ANO-1 License Renewal Integrated Plant Assessment System and Structures Screening”

Engineering Report 93-R-1010-01 describes the applicant’s process for performing the integrated plant assessment required by 10 CFR 54.21(a). Section 5.0 of Engineering Report 93-R-1010-01, “Scope of ANO-1 Structures,” states that the license renewal scope for structures includes components such as walls and floor slabs and commodities such as pipe hangers, control cabinets and panels, cable trays, and conduits, among other similar types of structural items. Attachment 2 of the same engineering report indicates that the reactor building not only performs several intended functions, it also performs a function that demonstrates compliance with the NRC regulations listed in 10 CFR 54.4(a)(3).

Engineering Report 93-R-1015-01 provides the detailed aging management review of the reactor building. In addition, for the reactor building, this report discusses the aging management reviews, intended functions, and the aging effects of all structural components. The team found an internal inconsistency in Engineering Report 93-R-1015-01, in that Table 2-1 indicates that both the leak chase channels and the tendon conduits do not perform or support any of the license renewal intended functions described in 10 CFR Part 54. Section 3.1.1.4 of the report states that “the leak chase channels do not support an intended function for the containment and are not within the scope of license renewal.” However, Section 3.3 indicates that the containment posttensioning system components, including the tendon conduit, are within the scope of license renewal. The team questioned why those two items, both of which do not have a license renewal intended functions, are treated differently. The applicant stated that both the leak chase channels and the tendon conduits are in the scope of license renewal; however, because neither are required to support an intended function, they are not subject to aging management review. The team agreed. The applicant committed to revising Engineering Report 93-R-1015-01 to correct this discrepancy.

c. Conclusion

The team found that, with the exception noted below, the applicant had performed scoping and screening of the reactor containment in accordance with the methodology described in the license renewal application.

> Engineering Report 93-R-1015-01 Discrepancy: The team found that the reactor building leak chase channels and the tendon conduits are not treated consistently, with respect to license renewal scope. The applicant committed to revising Engineering Report 93-R-1015-01 to correct this discrepancy.

2. Intake Structure

a. Description

The intake structure is a conventionally designed reinforced concrete structure and houses safety-related and nonsafety-related equipment, and performs the following functions:

- Provides structural or functional support to safety-related equipment
- Provides shelter or protection to safety-related equipment
- Serves as a missile (internal or external) barrier
- Provides structural or functional support to nonsafety-related equipment, failure of which could directly prevent satisfactory accomplishment of required safety-related functions
- Provides protective barriers against an external flood event

b. Review

The team reviewed Engineering Report 93-R-1015-04, "Aging Management Review of the Intake Structure," Drawing C-82, "Intake Structure, Plans and Sections," Drawing C-31, "Yard Underground Utilities," and pertinent sections of the FSAR. The team also walked down the intake structure and the intake canal. The applicant determined that the portion of the intake structure that is designed as Seismic Category 1, which are the structural components that provide support to the service water system, are within the scope of license renewal. The applicant also determined that the portions of the intake structure that is designed as Seismic Category 2 are not within the scope of license renewal. In response to RAI 2.2-1, the applicant stated in a letter dated August 30, 2000, that Lake Dardanelle, traveling screens, and bar grates are in their license renewal scope. However, the applicant screened out the traveling screens in accordance with 10 CFR 54.21 because they are active components. The team agreed.

The applicant also screened out the bar grates, because they do not perform a license renewal intended function, and their failure would not prevent the performance of a safety function. The applicant further stated that, in the event of a failure of the bar grates, operators would secure circulating water pumps, isolate the intake canal as the source of water, and realign service water pump suction to the emergency cooling pond. The team walked down the intake structure to confirm that the safety-related service water pumps could be easily isolated from the intake canal by closing sluice gates, and realigning service water to the emergency cooling pond. In addition, the team verified that the emergency cooling pond, which is in the scope of license renewal, has adequate inventory. This issue will remain open pending NRR review of the applicant's position concerning their screening out of the bar grates.

The team also noted some inconsistencies concerning the source of water for the service water system. Specifically, Table 3.1-1 of Engineering Report 93-R-1015-04 states, "Although the ultimate heat sink complex for ANO-1 consists of both the Emergency Cooling Pond and Lake Dardanelle, the Emergency Cooling Pond, rather than the lake, is the primary source of coolant." However, in Revision 16 of the FSAR, Table 9-15 "Service Water Summary," indicates that the water source for the service water pumps during normal operation is Lake Dardanelle and the emergency cooling pond is the source of water only for shutdown during design basis accidents. Section 2.3.3.10 of the applicant's license renewal application states that "If the source of water from Lake Dardanelle is lost, the emergency cooling pond can supply the water...." which implies that the lake water is the primary source for the service water pumps. Furthermore, Section 3.0 of Proc/Work Plan No. 1306.019, "Annual Emergency Cooling Pond Sounding," Revision 7, Change 01-0 states, "The Emergency Cooling Pond is used as a backup water supply in the event of the concurrent failure of the Dardanelle Reservoir." The applicant agreed to revise the Engineering Report 93-R-1015-04 to ensure consistency.

c. Conclusion

The team's assessment of the applicant's scoping and screening of the intake structure remains open pending NRR review of the applicant's justification for excluding the bar grates from their license renewal scope, as discussed above in this report. In addition, the applicant agreed to revise Engineering Report 93-R-1015-04 to correct inconsistencies concerning the preferred source of water for the service water system.

3. Emergency Diesel Fuel Oil Storage Tank Vault

a. Description

The emergency diesel fuel oil storage tank vault is a rigid reinforced concrete box structure and is a Seismic Category 1 structure. The vault houses four diesel fuel oil storage tanks. The applicant determined that the entire emergency diesel fuel oil storage tank vault is within the scope of license renewal.

b. Review and Conclusion

The team reviewed the applicant's license renewal application, plant drawings, and pertinent sections of the FSAR. The team concluded that the applicant had performed scoping and screening for the emergency diesel fuel oil storage tank vault in accordance with the methodology described in their license renewal application.

4. Turbine Building

a. Description

The turbine building is a Seismic Category 2 structure which houses the turbine generator and other Seismic Category 2 equipment, piping, and systems. The superstructure consists of structural steel, reinforced concrete slab, and steel grating floors. The building is enclosed with metal siding. The reinforced concrete turbine generator pedestal is designed for both dynamic and static load conditions. The applicant determined that except for some limited areas containing fire barrier components and commodities, the turbine building is not within the scope of license renewal.

b. Review

The team reviewed the applicant's license renewal application, turbine building plant drawings, and pertinent sections of the FSAR. In addition, the team performed a walkdown of portions of the turbine building and held discussions with applicant staff. In Section 2.4.6.2, "Bulk Commodities," of their license renewal application, the applicant stated that although some of the turbine building fire doors, fire walls, and slabs are within the scope of license renewal, the turbine building itself is not. The team found that the turbine building contains cables associated with the reactor protection system and the station blackout system, as well as fire protection. The applicant agreed that, in addition to the fire protection components, the turbine building contained cables for systems and components which performed or supported license renewal intended functions, and are in the scope of license renewal in accordance with 10 CFR 54.4(a)(3). The applicant agreed to revise Engineering Report 93-R-1010-01 to include these systems in the discussion of the turbine building.

c. Conclusion

The team concluded that, with the exception of the item discussed below, the applicant had performed scoping and screening for the turbine building in accordance with the methodology described in their license renewal application.

> Turbine Building Inscope Cables: The team found that the applicant had omitted station blackout and reactor protection system cables from their discussion, in Engineering Report 93-R-1010-01, of inscope components contained in the turbine building. The applicant agreed to revise this engineering report to specify the additional inscope components.

5. Startup Boiler Building

a. Description

The startup boiler building is a steel beamed building with sheet metal siding, and houses the startup boiler which is used to supply steam to various systems when

the main steam system is not available. The startup boiler building is not seismically designed and it does not provide or support a license renewal intended function as described in the Rule. Therefore, the applicant determined that this building is not in the scope of license renewal.

b. Review and Conclusion

The team walked down the building to verify if any of the systems, structures, or components contained in the building performed or supported an intended function. The team concluded that the applicant had performed scoping and screening of the startup boiler building in accordance with the methodology described in their license renewal application.

6. Radwaste Building

a. Description

The radwaste building is designed to temporarily store packaged low level radioactive waste material prior to its being shipped to an offsite processing or disposal facility. Section 11.1.3.3.8 of the FSAR states that this building design includes storage capacity for five years of waste generation. The one story concrete block wall building with metal siding is not safety related and does not contain any safety-related equipment and does not perform any safety-related functions. The building is not designed for seismic loading. The applicant determined that this building was not in the scope of license renewal, because it does not perform or support a license renewal intended function as described in the Rule.

b. Review and Conclusion

The team reviewed Architectural Drawing A-2302, “Solid Radwaste Storage Building (Pre-Engineered Metal Building),” Revision 6, and pertinent sections of the FSAR and agreed with the applicant’s assessment. The team concluded that the applicant had performed scoping and screening of the radwaste building in accordance with the methodology described in their license renewal application.

7. Bulk Commodities

a. Description

In their license renewal application, the applicant defined bulk commodities as structural members or items that support or protect various inscope systems, and are common to two or more structures. Bulk commodities fulfill the following intended functions:

- Provide structural support and functional support to safety-related equipment
- Provide structural support and functional support to nonsafety-related equipment whose failure could prevent the performance of a safety function
- Provide shelter or protection to safety-related equipment
- Provide rated fire barriers to confine or retard a fire
- Serve as missile barriers
- Provide protective barriers for internal and external flood events

In Table 3.6-8 of their license renewal application, the applicant listed their passive bulk commodities and the intended functions, grouped by material of construction. In Engineering Report 93-R-1015-07, the applicant states that the intended function of bulk commodities is determined by how the commodities relate to the inscope systems that they support.

b. Review

The NRC selected three bulk commodity groups for review that the applicant had determined were in their scope of license renewal: (1) piping and tubing supports, (2) threaded fasteners for fire damper mountings, and
(3) 10 CFR 50.48 required fire wraps. The team evaluated the applicant's scoping and screening methodology and results for each of these commodity groups, by reviewing the applicant's license renewal application and relevant license renewal boundary drawings, engineering reports, and FSAR sections. In addition, the team interviewed knowledgeable applicant staff members.

Piping and Tubing Supports: The applicant determined that piping and tubing supports associated with safety-related systems and nonsafety-related systems whose failure could prevent the accomplishment of a safety-related function were in the scope of license renewal.

Fasteners for Fire Damper Mountings: The applicant determined that these fasteners were long-lived commodities and were in the scope of license renewal, because they support an intended function described in 10 CFR 54.4.

10 CFR 50.48 Required Fire Wraps: The applicant determined that fire wraps were in the scope of license renewal, because they support an intended function described in 10 CFR 54.4. In reviewing Table 3.6-8 of the applicant's license renewal application, the team noted that flammastic was not included as a material used in fire barriers and fire wraps. The applicant informed the team that flammastic was indeed used in fire protection barriers and wraps, and agreed to

correct the table by issuing a clarification letter to the NRC. In addition, the applicant agreed to include flammastic in Engineering Report 93-R-1015-07, "Aging Management Review of Bulk Commodities."

c. Conclusion

The team determined that the applicant had performed scoping and screening in accordance with their license renewal application, with the following exception.

License Renewal Application Table 3.6-8 Discrepancy: Flammastic, which is used in 10 CFR 50.48-required fire protection barriers and wraps, was incorrectly omitted from Table 3.6-8 of the applicant's license renewal application. The applicant agreed to correct the table by issuing a clarification letter to the NRC. In addition, Engineering Report 93-R-1015-07, "Aging Management Review of Bulk Commodities," will be revised to include flammastic.

IV. Exit Meeting Summary

The NRC discussed the results of this inspection on December 20, 2000, with members of the applicant's management and staff, in an exit meeting open for public observation at the Arkansas Nuclear One site. The applicant acknowledged the findings presented and presented no dissenting comments. The team asked the applicant whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified. Slides used by the NRC during the exit meeting are attached to this report (Attachment 3). Subsequent to the public exit meeting, the applicant provided additional information that was considered in the final conclusions documented in this report.

ATTACHMENT 1
SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Applicant

R. Aharabli, Structural Design Engineer
M. Cooper, Licensing Specialist
A. Cox, Supervisor, Design Engineering
N. Mosher, Licensing Specialist
T. Ott, Design Engineer, Electrical, Instrumentation and Control
R. Rispoli, Supervisor, Fire Protection Engineering
G. Young, Manager, Business Development

NRC

R. Bywater, Senior Resident Inspector, Arkansas Nuclear One

LIST OF DOCUMENTS REVIEWED

The following documents were selected and reviewed by the team to accomplish the objectives and scope of this inspection:

CALCULATIONS

Number	Description	Revision
89-E-0047-07	ANO-1 Emergency Feedwater System	1
89-E-0047-08	ANO-1 Power Conversion System	0
89-E-0047-12	ANO-1 Intermediate Cooling Water System	1
89-E-0047-13	ANO-1 Service Water System	1

DRAWINGS

Number	Title	Revision
7-DH-17	Large Pipe Isometric Decay Heat Pump Suction from Reactor Building Sump, Sheet 1	8
A-2302	Solid Radwaste Storage BLDG (Pre-engineered Metal Building)	6
C-31	Yard Underground Utilities	23
C-82	Intake Structure Plans & Sections	21
C-97	Reactor Building Sump Screen, Sheet 1	4
C-383	Startup Boiler Paving & Drainage	0

Number	Title	Revision
C-384 SH 1 of 12	Startup Boiler Structural Steel Roof Plans	0

ELECTRICAL ONE LINE DRAWINGS

Number	Title	Revision
E-1	Station Single Line Diagram, Sheet 1	45
E-4	Single Line Meter & Relay Diagram 4160 Volt System, Main Supply, Sheet 1	26
E-5	Single Line Meter & Relay Diagram 4160 Volt System, Eng'd. Safeg'd., Sheet 1	25
E-7	Single Line Meter & Relay Diagram 480 Volt Load Centers, Main Supply, Sheet 1	28
E-8	Single Line Meter & Relay Diagram 480 Volt Load Centers Engineered Safeguard & Main Supply, Sheet 1	22
E-17	Vital AC and 125V DC Single Line and Distribution, Sheet 1	40
E-17	Vital AC and 125V DC Single Line and Distribution, Sheet 1A	6
E-481	Connection Schedule Computer Analog Inputs, Sheet 84	2

ENGINEERING REPORTS

Number	Description	Revision
93-R-1009-01	ANO-1 License Renewal Project Methodology and Management Plan	0
93-R-1010-01	ANO-1 License Renewal Integrated Plant Assessment System and Structures Screening	0
93-R-1011-01	Review of the Programs Credited in the License Renewal Evaluations	0 (Draft)
93-R-1013-03	Demonstration of the Management of the Aging Effects for the ANO-1 RCS Piping	0
93-R-1015-01	Aging Management Review of the Reactor Building	1
93-R-1015-02	Aging Management Review of the Reactor Building Internals	1
93-R-1015-04	Aging Management Review of the Intake Structure	1

Number	Description	Revision
93-R-1015-05	Aging Management Review of the Emergency Cooling Pond and the Intake/Discharge Canals	2 (Draft)
93-R-1015-06	Aging Management Review of Aboveground/Underground Yard Structures and Associated pipe Trenches	1
93-R-1015-07	Aging Management Review of Bulk Commodities	1
93-R-1016-03	Aging Management Review of the Main Feedwater System	1
93-R-1016-06	Aging Management Review of the Service Water System	1 (Draft)
93-R-1016-07	Aging Management Review of the Emergency Diesel Generator System	1 (Draft)
93-R-1016-08	Aging Management Review of the Makeup and Purification/High Pressure Injection System	1 (Draft)
93-R-1016-10	Aging Management Review of the Decay Heat / Low Pressure Injection System	1 (Draft)
93-R-1016-11	Aging Management Review of the Auxiliary Building and Reactor Building Drains	1 (Draft)
93-R-1016-16	Aging Management Review of the Emergency Feedwater System	1 (Draft)
93-R-1016-18	Aging Management Review of the Alternate AC Generator System	1 (Draft)
93-R-1016-22	Aging Management Review of the Fuel Oil System	1 (Draft)
93-R-1016-24	Aging Management Review of the Chilled Water System	1 (Draft)
94-R-1016-25	Aging Management Review of the Instrument Air Components	1 (Draft)
93-R-1017-01	Aging Management Review of the Passive Electrical Components	1
93-R-1017-02	ANO-1 License Renewal Screening of Ohmic Heating in Power Cables	1
93-R-1017-03	ANO-1 License Renewal Screening of Power Cables Potentially Subject to Wetting	1
93-R-1017-04	ANO-1 License Renewal Screening of Frequently Manipulated Cables & Terminations	1

Number	Description	Revision
93-R-1017-05	ANO-1 License Renewal Screening of Cables and Terminations Exposed to Potentially Hazardous Chemicals	1
93-R-1017-06	ANO-1 License Renewal Screening of Impedance Sensitive Circuits	1
93-R-1017-07	ANO-1 License Renewal Screening of Cables Exposed to High Radiation	1
93-R-1017-08	ANO-1 License Renewal Screening of Cables Outside Containment Exposed to Elevated Temperatures	1
93-R-1017-09	ANO-1 License Renewal Screening of Cables Inside Containment Exposed to Elevated Temperatures	1
93-R-1017-10	ANO-1 License Renewal Screening of Electrical Connections	1

PIPING & INSTRUMENT DIAGRAMS

Number	Title	Revision
LRA-M-204	Emergency Feedwater, Sheet 3	0
LRA-M-204	Emergency Feedwater Storage, Sheet 5	1
LRA-M-204	EFW Pump Turbine, Sheet 6	1
LRA-M-206	Steam Generator Secondary System, Sheet 1	1
LRA-M-206	MSIV Operator Controls, Sheet 2	1
LRA-M-209	Cir. Water, Service Water & Fire Water Intake Structure Equipment , Sheet 1	1
LRA-M-210	Service Water, Sheet 1	0
LRA-M-213	Dirty Radioactive Waste Drainage & Filtration, Sheet 1	0
LRA-M-213	Laundry Waste and Containment & Aux Bldg Sump Drainage, Sheet 2	0
LRA-M-214	Clean Liquid Radioactive Waste, Sheet 3	0
LRA-M-217	Emergency Diesel Generators - Fuel Oil Storage, Sheet 1	0
LRA-M-217	Emergency Diesel Generator K-4A/K-4B - Starting Air System, Sheet 4	0
LRA-M-218	Instrument and Service Air, Sheet 4	1

Number	Title	Revision
LRA-M-218	Breathing Air System Reactor Building, Sheet 5	0
LRA-M-221	Emergency Chilled Water System, Sheet 2	0
LRA-M-222	Chilled Water System Reactor and Auxiliary Buildings, Sheet 1	1
LRA-M-222	Reactor Coolant System, Sheet 2	1
LRA-M-230	Reactor Coolant System, Sheet 1	0
LRA-M-231	Makeup and Purification System, Sheets 1, 2, & 3	0
LRA-M-232	Decay Heat Removal System, Sheet 1	0
LRA-M-233	Chemical Addition System, Sheet 1	1
LRA-M-234	Intermediate Cooling System, Sheet 1&2	1
LRA-M-236	Reactor Building Spray and Core Flooding System, Sheet 1	0
LRA-M-237	Sampling System, Sheet 1	1
LRA-M-261	Reactor Building H.V.A.C., Sheet 1	1
LRA-M-262	H.V.A.C. Auxiliary Building Radwaste Area, Sheet 1	0
LRA-M-262	Auxiliary Building - Radioactive Waste Areas H.V.A.C., Sheet 2, 3 & 4	0
LRA-M-263	Units 1&2 Control & Computer Rooms H.V.A.C., Sheet 1	1
LRA-M-263	Auxiliary Building H.V.A.C. Elevation 372' and 386', Sheet 2 & 3	0
LRA-M-264	Ventilation System Air Flow Containment Penetration Room, Sheet 1	0
LRA-M-2221	Control & Computer Room Emergency H.V.A.C. Freon System, Sheet 2	0
LRA-M-2241	AAC Generator System - Engine Cooling Water Subsystem, Sheet 1	0
LRA-M-2241	AAC Generator System - Air Intake & Exhaust Subsystem, Sheet 2	0
LRA-M-2241	AAC Generator System - Fuel Oil System, Sheet 3	0

Number	Title	Revision
LRA-M-2241	AAC Generator System - Starting Air & Service Air Subsystems, Sheet 4	0
LRA-M-2241	AAC Generator System - Lube Oil System, Sheet 5	0
M-209	Condenser Vacuum, Circ. Water & Discharge Structure Equipment, Sheet 2	37
M-212	Demineralization Distribution, Sheet 2	57
M-221	Chilled Water System Control Room Electrical Areas, Sheet 1	44
M-221	Emergency Chilled Water System Auxiliary Building Electrical Rooms, Sheet 2	25
M-221	Administration Building, Sheet 3	11
M-222	Chilled Water System Reactor and Auxiliary Buildings, Sheet 1	63
M-222	Chilled Water Auxiliary Building Office and Lab Area, Sheet 2	19
M-222	Chilled Water System Main Chiller Refrigerant Lubrication & Control, Sheet 3	1
M-222	Main Chiller Cooling Water, Sheet 4	3
M-2212	Makeup Water Demineralization System, Sheet 4	21

PROCEDURES

Procedure Number	Title	Change
1106.006	Emergency Feedwater Pump Operation	050-00-0
1202.012	Repetitive Tasks	004-01-0
1203.012K	Annunciator K12 Corrective Action	031-02-0
HES-09	Inservice Inspection Program	2
HES-17	ANO-1 Inservice Test Program Bases Document	3

UPPER LEVEL DOCUMENTS

Number	Description	Revision
ULD 1-SYS-01	ANO Unit 1 Emergency Diesel Generator (EDG) System	3

Number	Description	Revision
ULD-1-SYS-02	Makeup and Purification/High Pressure Injection System Upper Level Document	1
ULD-1-SYS-03	Unit 1 125 Volt DC System	4
ULD-1-SYS-04	Decay Heat Removal/Low Pressure Injection System	2
ULD-1-SYS-05	Reactor Building Spray System	2
ULD-1-SYS-10	Service Water System	6
ULD-1-SYS-11	Instrument Air	0
ULD-1-SYS-12	Emergencey Feedwater System	3
ULD-1-SYS-13	Main Feedwater System	2 with DCP 95-1010 change request
ULD-1-SYS-16	ANO Unit 1 4.16 KV System	2
ULD-1-SYS-17	ANO-1 480 VAC Distribution System	0
ULD-1-SYS-19	ANO Unit 1 and Unit 2 Alternate AC Generator System (AAC)	0
ULD-1-SYS-020	ANO Unit 1 120 Volt AC System	3
ULD-1-SYS-26	Intermediate Cooling Water	2
ULD-1-SYS-48	Condensate, Condensate Storage and Transfer and Condensate Demineralizer Systems	1
ULD-1-TOP-07	ANO Unit One Emergency Feedwater System Sizing Analysis	0
ULD-2-SYS-48	Condensate, Condensate Storage and Transfer and Condensate Demineralizer Systems	3

MISCELLANEOUS DOCUMENTS

Sandia report, Aging Management Guideline for Commercial Nuclear Power Plants-Electrical Cable and Terminations, September 1996

LIST OF ACRONYMS AND ABBREVIATIONS USED

aac alternate alternating current

ac	alternating current
AMSAC	ATWS Mitigation System Actuation Circuitry
ANO	Arkansas Nuclear One
ANO-1	Arkansas Nuclear One, Unit 1
ANO-2	Arkansas Nuclear One, Unit 2
ATWS	anticipated transients without SCRAM
AV	atmospheric vents
BWST	Borated Water Storage Tank
CCW	Condenser Circulating Water
CST	Condensate Storage Tank
DBA	Design Basis Accident
dc	direct current
DH	decay heat
DHR	decay heat removal
ECP	emergency cooling pond
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
EQ	Environmental Qualification
FSAR	Final Safety Analysis Report
HPI	High Pressure Injection
HVAC	Heating, Ventilation, and Air Conditioning
ICW	Intermediate Cooling Water
KV	Kilovolt
LOCA	Loss of Coolant Accident
LPI	Low Pressure Injection
LRA	License Renewal Application
MFW	Main Feedwater
MUP	Makeup and Purification
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NRR	NRC Office of Nuclear Reactor Regulations
P&ID	Piping and Instrumentation Diagram
RB	Reactor Building
RBS	Reactor Building Spray
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
Rule	10CFR50.54
SSC	System, Structure, Component
SW	Service Water
ULD	Upper Level Document
V	Volt

ATTACHMENT 2
SYSTEMS AND STRUCTURES INCLUDED IN SCOPE

Listing of ANO-1 Mechanical, Electrical Systems and Structures

SYSTEM		IN SCOPE	LRA SECTION(S)
4.16 KV Switchgear		X	2.5
120 V Instrument AC		X	2.5
120 VAC		X	2.5
125 V DC		X	2.5
480V Load Centers		X	2.5
Alternate AC Diesel Generator		X	2.3.3.5, 2.5
Atmospheric Vents		Not in scope of LRA	
Auxiliary Building Drains		Not in scope of LRA	
Chilled Water		X	2.3.3.9, 2.5
Control Room Ventilation		X	2.3.3.13, 2.5
Emergency Diesel Generator	X		2.3.3.3, 2.5
Emergency Feedwater		X	2.3.4.3, 2.5
Emergency Feedwater Initiation and Control		X	2.5
High Pressure Injection		X	2.3.2.3,
Instrument Air	X 1		2.3.3.8, 2.5
Intermediate Cooling		X 1	2.3.2.7, 2.3.2.8, 2.5
Low Pressure Injection		X	2.3.2.2, 2.5
Main Feedwater		X	2.3.4.2, 2.5
Makeup and Purification		X	2.3.2.3, 2.5
Plant Computer		Not in scope of LRA	
Reactor Building Purge		X 1	2.3.2.5
Reactor Protection		X	2.5
Service Water	X		2.3.3.10, 2.5
Emergency Diesel Fuel Oil Storage Tank Vault		X	2.4.6.1
Intake Structure		X 2,3	2.4.4
Radioactive Waste Building		Not in scope of LRA	
Reactor Building		X 2	2.4.1 and 2.4.2
Startup Boiler Building		Not in scope of LRA	
Turbine Building		X 4	2.4.3 and 2.4.6.2

NOTES:

'X' – Denotes system is within the scope of license renewal

1. A small portion of the system is in scope
2. Includes associated structural components and commodities (i.e., supports, spent fuel pool) within the scope of license renewal.
3. Category 1 portions.
4. Limited areas containing 10CFR50.48-required fire barriers are inscope.

ATTACHMENT 3
NRC PUBLIC EXIT MEETING PRESENTATION

ANO Unit 1
License Renewal
Scoping/Screening Inspection

Rebecca Nease
Inspection Team Leader

Inspection Team Members
Caudle Julian
Bill McNeill
Ray Mullikin
Hai-Boh Wang
Kathy Weaver

License Renewal Regulations

10 CFR Part 54 License Renewal Application

- 10 CFR 54.4 Defines the Scope
- 10 CFR 54.21 Describes the Structures, Systems and Components whose aging effects must be managed
  - Requires the aging effects to be identified
  - Requires a program that manages the effects of aging

10 CFR Part 51 Environmental Impacts

Renewal Application

- Integrated Plant Assessment
  - Identify structures and components in the Scope of License Renewal
  - Describe how scope / screening was performed
  - Demonstrate aging effects will be managed
  - Evaluate time-limited aging analyses and exemptions
- FSAR supplement
- Technical specification changes
- Environmental report supplement

License Renewal Scope

- **Safety** - related systems, structures and components needed during certain postulated events

- **Non-Safety** - related systems, structures and components whose failures could prevent the safety related systems, structures and components from performing their functions

- Systems, structures and components that are necessary to mitigate the following regulated events:
  - *Fire Protection (10 CFR 50.48)*
  - *Environmental Qualification (10 CFR 50.49)*
  - *Pressurized Thermal Shock (10 CFR 50.61)*
  - *Anticipated Transients without Scram (10 CFR 50.62)*
  - *Station Blackout (10 CFR 50.63)*

Inspection Activities

- Scoping / Screening Inspection
  - One-Week Team Inspection
    - Dec 11-15, 2000
- Aging Management Review Inspection
  - Two-Week Team Inspection
    - January 22-26, 2001
    - February 5-9, 2001
- Open Items Inspection (Optional)
    - Generated in the first two inspections or as a result of HQ review
    - Date to be determined

Scoping /Screening Inspection

- MC 2516, “Policy and Guidance for the License Renewal Inspection Programs”
- Inspection Procedure 71002, “License Renewal Inspection”
  - Supports the review process
  - Independently verifies thru sampling that the Applicant has performed the scoping and screening portions of their license renewal effort IAW Part 54 and the methods described in their LR application
- Results of this inspection will be documented in Inspection Report 00-17

Inspection Report

- Report will not be written using the MC 0610* format
- Open Items
  - Will not be numbered in the report
  - Will be closed as follows
    - In a future inspection report
    - By inclusion in the NRC's Safety Evaluation Report
- No Enforcement Items

Inspection Scope

- 20% of the systems and structures that were determined by the Applicant to be in scope
  - Selection was risk-based

- 7 systems and structures that were determined by the Applicant to be outside the scope of LR to confirm that their methodology for exclusion met the Rule

Inspection Results

- Service Water
  - Open Item
    - Trash Racks, Bar Grates and Screens in SW are not in Scope
  - Commitments
    - SW discharge flume was not discussed in the AMR as being in scope
  - Resolution
    - Referred to NRR for resolution
  - Resolutions
    - Flume is in the scope and the AMR will be revised to include it.

Inspection Results

- Service Water (continued)
  - Commitments (continued)
    - AMR 93-R1015-04 discussion was confusing with respect to normal and assured water supply (Minor Discrepancy)
    - M210, SH1 at grid A4 has a “Y” within a circle symbol that is not described or defined (Minor Discrepancy)
  - Resolutions
    - AMR will be revised
    - Drawing will be corrected to show a “V”

Inspection Results

- Service Water (continued)
  - Commitments (continued)
    - LR Dwg 210 SH 1 refers to Dwg 209 for the continuation of CW discharge Flume line. Dwg 209 does not show the CW discharge Flume line (JBD-15-18)
  - Resolutions
    - Drawings will be corrected.

Inspection Results

- Emergency Feed Water
  - Open Items
    - LRA, ULD and PRA describe U2 SR'd CST as a source for U1 EFW. Boundary drawings do not include U2 SR'd CST
    - U1 Non-Q CST is described in LRA as potential source of EFW. CH 14 analysis references FSAR 10.4.8 which also includes U1 Non-Q CST as a source. Boundary drawings do not include U1 Non-Q CST in scope.
  - Resolutions
    - Referred to NRR for resolution
    - Referred to NRR for resolution

Inspection Results

- Emergency Feed Water
  - Commitment
    - Is EFW Terry Turbine steam exhaust drain line rubber boot in scope of LR?
    - Inconsistency in treatment of drain lines from steam traps ST-79, 129, and 130.
  - Resolution
    - Rubber boot is part of Appendix R, is a commodity and AMR will be revised. Applicant will search for others.
    - Drawings will be revised to show drain lines from steam traps as screened out.

Inspection Results

- Intermediate Cooling Water
  - Commitment
    - Table 2.2-1 of the LRA incorrectly refers to Sect 2.3.2.8. Corrected reference is Sect 2.3.2.7. (Minor Discrepancy)
  - Resolution
    - LRA will be corrected via a clarification letter.

Inspection Results

- Main Feed Water
  - Open Item
    - MFW Block and Control valves are backup for FWIV's. Flow/Temp instrumentation and assoc'd piping are used in AMSAC. These are not shown within the LR boundary.
  - Resolution
    - Referred to NRR for resolution
- Instrument Air
  - Commitment
    - Numerous discrepancies between AMR 93-R-1016-25 and IA Boundary drawings
  - Resolution
    - Applicant will revise drawings and AMR.

Inspection Results

- Chilled Water
  - Commitment
    - On M221, SH 2 Boundary drawing for CW, all of Train A is in scope where part of Train B is not in scope. (Minor Discrepancy)
  - Resolution
    - Applicant will revise the drawing to show all of Train B in scope.
- Electrical I & C
  - Commitment
    - Discrepancy between the AMR and the EDG Lube Oil drawing with respect to valve 2PSV7132.
  - Resolution
    - Applicant will revise the AMR to remove the valve from scope.

Inspection Results

- Fire Protection
  - Commitment
    - In table 3.6-8 of the LRA, Flamastic penetration sealant (P.3-132) was not included.
  - Resolution
    - Applicant will revise AMR to include & will send a clarification letter to correct the LRA.

Inspection Results

- Reactor Building
  - Commitments
    - Discrepancy between sect 2 and 3 of the RB AMR regarding whether tendon conduit is in scope. (Minor Discrepancy)
    - What function does the leak chase perform? Should it be in scope?
  - Resolutions
    - Applicant will revise Sect 3.3 of AMR.
    - Installed during construction for testing leak tightness of welds and should be in scope. Applicant will revise AMR.

Inspection Results

- Turbine Building
  - Open Item
    - FSAR used Turbine / Auxiliary building nomenclature.
    - Is Turbine Building in scope only for fire protection? What other SSC's contained in TB that would perform a LR function?
  - Resolution
    - Open pending further team review and discussion with Applicant.
    - TB contains SBO, RPS and ARTS cables. Applicant will revise Engr Rpt 1010 to include above.

Inspection Results

- Administrative
  - Open Items
    - Will all Engineering Reports are completed and signed off by the beginning of the next inspection? The inspection begins on 1/22/2001.
    - Very recently asked for a list high risk maintenance items that were also “S” class
  - Resolutions
    - Awaiting Information
    - Awaiting Information