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Christopher J. Schwarz
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Arkansas Nuclear One

2CAN011102

January 17, 2011

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Response to the Request for Additional Information Regarding License Amendment Request Technical Specification Change to Extend the Type A Test Frequency to 15 Years
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

REFERENCES:
1. Entergy letter dated June 17, 2010, "License Amendment Request Technical Specification Change to Extend the Type A Test Frequency to 15 Years" (2CAN061003)
2. NRC email dated November 23, 2010, "Request for Additional Information (RAI) on License Amendment Request dated June 17, 2010, Technical Specification Change to Extend the Type A Test Frequency to 15 years – REVISION 1" (TAC No. ME4090)

Dear Sir or Madam:

Entergy Operations, Inc. (Entergy) proposed a change to the Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specifications (TS) via Reference 1. Specifically, the change would allow for the extension of the ten-year frequency of the ANO-2 Type A or Integrated Leak Rate Test (ILRT) required by TS 6.5.16 to 15 years on a permanent basis. In Reference 2, the NRC requested additional information (RAI) with regard to the Entergy request. The NRC requested the additional information to be submitted within 60 days.

In Reference 1, Entergy provided the most recent Type B and Type C test results and their comparison with the allowable leakage rates. RAI 2.1 (b) requested a summary of the performance results of these tests that would support the maximum and minimum Pathway Leakage values. In developing the response to the RAI, it was determined that the information that was provided in Reference 1, while conservative, was not correct. The maximum and minimum leakage values from Reference 1 and the corrected values are presented below. The details are provided in the response to the RAI.

2R19
As-Found Minimum

From Reference 1	**Corrected**
8,168 standard cubic centimeters per minute (sccm)	7,847 sccm

As-Left Maximum

17,561 sccm	17,466 sccm

2R20
As-Found Minimum

9,373 sccm	9,372 sccm

As-Left

18,810 sccm	18,162 sccm

The combined Type B and Type C leakage acceptance criterion remains 103,894 sccm and did not change. This error has been discussed with the NRR Project Manager and is being addressed in the ANO corrective action program.

It should be noted that Reference 2 contained an RAI to discuss how the Type B and C test intervals were implemented in the current testing program and how they would be implemented using NEI 94-01, Revision 2-A (RAI 2.1(d)). Based on discussions with the NRC Project Manger, it was determined that Entergy was not required to respond to that particular RAI. Therefore that RAI is not listed in the attachment nor is a response provided.

The attachment to this letter provides the requested information.

There are no new commitments in this letter.

If you have any questions or require additional information, please contact Stephenie Pyle at 479-858-4704.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January 17, 2011.

Sincerely,

Original signed by Christopher J. Schwarz

CJS/rwc

Attachment: Request for Additional Information

cc: Mr. Elmo E. Collins
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Attachment to

2CAN011102

Request for Additional Information

REQUEST FOR ADDITIONAL INFORMATION

1.1 Since degradation of bellows is a source for potential leakage, the staff requests the licensee to please identify any bellows used on penetrations through containment pressure retaining boundaries, and if present, provide information on their location, inspection, testing and operating experience with regard to detection of leakage.

Arkansas Nuclear One, Unit 2 (ANO-2) does not employ bellows on penetrations through containment pressure retaining boundaries.

1.2 The staff notes that the licensee's stated intent, as indicated throughout the LAR (see sections 1.0, 2.0 and 4.0), is to implement a containment leakage rate testing program in accordance with the guidelines contained in *NEI 94-01, Revision 2-A*, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated October 2008.

However, in page 5 of the LAR the licensee states the following:

> **The proposed change replaces the reference to RG 1.163 with a reference to NEI 94-01; however, the proposed TS change is worded to indicate that the Appendix J Testing Program must be in accordance with NRC-reviewed and accepted guidelines (i.e., NEI 94-01), with the specific version of those guidelines specified in the Appendix J Testing Program Plan. These proposed TS changes are consistent with the regulatory requirement to include the implementation document used to develop the performance-based leakage testing program, by general reference, in the plant TS, and assures that only NRC-reviewed and accepted guidance is used to develop the program. *In addition, these changes will allow the use of later NRC-accepted versions of NEI 94-01 without the unnecessary burden of processing a license amendment."***

The above is not consistent with the intent of the LAR nor does it reflect that any changes to the containment Type A testing program that are not in accordance with the guidance provided with NEI-94-01, Rev 2-A would require NRC approval before implementation.. The staff requests that the licensee revise or clarify the statement made in page 5 of the LAR.

Upon further review, Entergy agrees that the paragraph in question is not consistent with the rest of the LAR nor its intent to implement a containment leakage rate testing program in accordance with the guidelines contained in NEI 94-01, Revision 2-A. This paragraph should be deleted and no further NRC consideration be given to it. The deletion of this paragraph does not alter the remaining portions of the LAR.

2.1. In order for the NRC staff to assess the proper and effective implementation of the Type B and Type C local leak rate testing program, the licensee is requested to provide:

(a) A table of all containment pressure boundary components at ANO-2 that are subject to the Type B and Type C testing, under the Containment Leakage Rate Testing Program, with the current test frequency and the approximate dates (or refueling outage) of the last test and the next scheduled test.

Table 2.1-1 of this attachment provides the requested information.

(b) Provide a summary of performance results for Type B and Type C testing that would support the maximum and minimum Pathway Leakage values detailed in section 4.2 of the LAR.

The Type B and Type C performance results from the last two ANO-2 refueling outages (2R19 and 2R20) are provided in Table 2.1-2. 2R19 occurred in the Spring of 2008 and 2R20 occurred in the Fall of 2009.

(c) A summary table of LLRT results of those containment penetrations (including their test schedule intervals) that have not demonstrated acceptable performance history in accordance with the Containment Leakage Rate Program and a discussion of the causes and corrective actions taken.

Table 2.1-3 of this attachment provides a summary of the containment penetrations that did not demonstrate acceptable performance during 2R19 and 2R20.

(d) A discussion of whether there have been any refueling outages since the last Type A test in which the combined leakage from Type B and Type C tests did not meet the acceptance criteria. Please provide a discussion of the results, cause(s), and corrective actions taken.

The as-found combined leakage from Type B and Type C tests are evaluated by summation of the limiting pathway leak rate measurement of each penetration. This pathway is the smaller of the inboard and outboard leak rate measurement. This summation determines the as-found Type B and Type C leak rate on a minimum path basis. There has been no outage since the last Type A test (conducted in November 2000) in which the combined as-found minimum path leak rate from Type B and Type C tests exceeded acceptance criteria specified in ANO-2 Technical Specifications (0.6 L_a).

2.2 Please provide a summarized Table containing the previous ANO-2 ILRT Type A tests data, including the completion dates of the last two tests, actual as-found results data as well as the allowable TS acceptance criterion values for those tests that confirm that the containment structure leakage is acceptable.

Table 2.2-1 provides the results of the ILRT Type A tests.

TABLE 2.2-1
ILRT Type A Test Results

	Calculated Leakage Rate	
Completion Date	**Mass Point Calculation**	**95% Upper Confidence Level**
May 31, 1981	0.028% / day	0.033% / day (Note 1)
May 1, 1985	0.022% / day	0.023% / day (Note 1)
April 22, 1988	0.028% / day	0.032% / day (Note 1)
April 9, 1991	0.0197% / day	0.0229% / day (Note 1)
March 17, 1994	0.0517% / day	0.0553% / day (Note 1)
November 30, 2000	0.049% /day	0.056% /day (Note 2)

Note 1: Percent of containment air weight per day at P_a (54 psig).
Note 2: Percent of containment air weight per day at Structural Integrity Test pressure (68 psig).

ILRT Acceptance Criteria is 0.075% /day (ANO-2 Technical Specification 6.5.16).

2.3 In regards to the ANO-2 Containment Inservice Inspection Plan (CISI), an extension to a 15-year ILRT interval would span at least four ISI inspection periods. Please provide a schedule, with approximate dates (or refueling outage) of the next general visual examinations to be performed in order to satisfy the requirements of NEI 94-01 Rev. 2-A, section 9.2.3.2.

The 30th Year Containment inspection for ANO-2 was conducted during June 2010. No recordable indications were observed during the general exterior inspection of the containment structure. Based on the data that was collected during the 2010 30th Year Containment IWL inspection, the conclusion was reached that no new abnormal degradation of the post tensioning system has occurred with regard to the ANO-2 containment structure.

The 35th Year inspection is currently scheduled to be performed in March 2014 and the 40th Year inspection is scheduled for the Fall of 2018.

A visual examination of the interior of the ANO-2 containment (i.e., the liner) is performed once each ISI period. This equates to three exams during the 10-year interval. No unacceptable indications have been identified to date.

2.4 Consistent with NRC Information Notice 2004-09, "Corrosion of Steel Containment and Containment Liner," discuss the operating experience and evaluation results, if any, of the potential for, or presence of corrosive conditions at the junction of the metal liner and interior concrete floor, including the potential for stagnant water behind a degraded floor seal area that may promote pitting corrosion.

The 1992 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, Table IWE-2500-1, Examination Category E-D, Item E5.30, requires that 100% of the moisture barrier be examined each interval. ANO-2 is committed to conducting this examination each inspection period.

In January 1999, the moisture barrier seal was removed, cleaned and inspected. Several areas at the junction of the metal liner and interior concrete floor were found to have rust with some localized pitting / degradation. The metal liner was found to have sufficient thickness and was recoated using approved Service Level I coating specification. A new moisture barrier was installed after the final acceptance of the Service Level I coating. Several areas outside of the metal liner interior concrete floor interface were also found to have rust. Based on these results, a random sampling was performed to ensure that the findings were not structurally significant.

It was noted during the walkdowns that some of the premolded material below the Primary Wall gap, normally found below the gap sealant, was missing in some cases. Boroscope probes revealed no structural degradation. Therefore, the sealant was replaced along with a suitable backup rod / material to prevent the sealant from moving out of position.

No significant liner plate pitting or degradation was noted as a result of this random sampling. It was determined that the liner plate degraded areas could be left as-found once the coating, gap sealant, etc. was re-applied. All the reported liner plate thicknesses were within a few thousandths of the required ¼" thickness.

During the Fall of 2000 (2R14) inspection of the moisture barrier, no degradation was found.

During 2R17 (Spring of 2005), a total of 87 areas were identified as defects during the IWE VT-3 examination. There were 79 tear areas, four damaged areas, three wear areas and one other area which was a piece of wire that was stuck into the caulk. All of these areas were repaired and reinspected. No corrosion was noted during the examination in any of the defect areas.

The moisture barrier was again inspected during 2R18 (Fall of 2006). Seven areas were identified as defects during this inspection. These defects were repaired and reinspected.

In the Spring of 2008 (2R19), the moisture barrier was inspected. During this inspection three damage areas were identified. These areas penetrated completely through the moisture barrier caulk membrane. There was no evidence of water in the vicinity or penetrating to the substrate below the damaged barrier.

In the last refueling outage in the fall of 2010 (2R20), no evidence of defects was identified in the moisture barrier.

2.5 In response to Condition 4 in Section 4.1 of the NRC SE for topical report NEI 94-01, Revision 2-A, the ANO-2 response in Item 4 of the Table on page 5 of 14 of the LAR states that, "The design change process will address any testing requirements for this potential and any future containment structure modifications."

(a) Describe how the above statement addresses the requirements of Condition 4 of Section 4.1 and as discussed in Section 3.1.4 of the NRC safety evaluation for NEI 94-01, Revision 2-A, with regard to major and minor containment repairs and modifications.

The design change process at Entergy is governed by an Entergy fleet procedure. The two purposes for this procedure are as follows:

1. This procedure is a part of the Entergy Nuclear standard process for Engineering Changes (ECs), from EC development through closure. This procedure shall be used in conjunction with other procedures governing the Plant Configuration Change Process.

2. This procedure is the single process governing an Engineering Change, including changes to plant related structures, systems, and components (SSCs).

The design change procedure requires that an Impact Screening be performed for engineering changes requiring modifications to plant SSCs. An Impact Screening is defined as a list of engineering considerations to determine engineering programs, engineering disciplines or departmental impact and required input. The Impact Screening provides a disciplined and consistent approach for determining the interfaces associated with an engineering change and/or other pertinent discipline design considerations. The Impact Screening is performed to determine program impact and to determine external department impact considerations during engineering change development. An attachment to the procedure is the Impact Screening Summary which contains questions on the subject of engineering disciplines, maintenance, process or programs, and programs and components that are to be reviewed for impacts based on the scope of the proposed modification. As part of this attachment

are specific questions pertaining to the ASME Containment In-Service Inspection (CISI) Program, ASME Appendix J (Primary Containment Leak Rate Testing) Program, and ASME Section XI Repair/Replacement Program. Therefore, when performing the Impact Screening, the screener is prompted for potential impacts to these programs based on the scope of the proposed modification and the applicable program owner is subsequently consulted for further required actions including testing requirements by that program.

The design change procedure also requires, as part of the process, that a Process Applicability Determination (PAD) in accordance with another Entergy fleet procedure be performed for engineering changes requiring modifications and/or evaluations where no installation is required, accept as-is configurations or optional alternative configurations. The purpose of the PAD is to determine:

1. Which plant licensing basis documents (LBDs) and processes are affected by a proposed activity and must be revised to reflect the activity,

2. The appropriate regulatory review (i.e., 10 CFR 50.59) or industry code review that is required for implementing a proposed activity, and

3. Whether an activity requires review in a 10 CFR 50.59 evaluation. Based on the results of the evaluation the proposed modification or activity may require prior NRC approval.

In summary, based on the above discussion, the design change process at Entergy, utilizing the Impact Screening, PAD, and 10 CFR 50.59 Evaluation as required by established company procedures, ensures that the requirements of Condition 4 of Section 4.1 and as discussed in Section 3.1.4 of the NRC safety evaluation for NEI 94-01, Revision 2-A with regard to major and minor containment repairs and modifications would be met.

(b) Address why it is appropriate to make reference to a "design change process," which is not subject to NRC review, in an application for a licensing action.

As described above, the design change process utilized by Entergy ensures that, if required, the NRC review of any proposed modifications is obtained prior to the installation of the modification.

(c) Clarify whether the repair/replacement program, which includes associated post modification testing for the ANO-2 containment structure, is performed as part of the CISI program in accordance with 10 CFR 50.55a(g)(4) or as part of the "station design change process."

The ANO-2 ASME Section XI Repair / Replacement Program provides the requirements for performing repair / replacement activities to Class MC components and component supports and Class CC concrete containments as required by 10 CFR 50.55a. The design change process is separate from this

program; however it is used to facilitate / implement the requirements of the Repair/Replacement Program.

TABLE 2.1-1
ANO-2 COMPONENT PRESSURE BOUNDARY COMPONENTS SUBJECT TO TYPE B AND TYPE C TESTING

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-6	Out	2SV-8231-2	RX Bldg HVAC Hydrogen (H2) Purge Inlet	9/6/2009	2R23 Spring 2014	3R (54 months)
	In	2CV-8233-1	RX Bldg HVAC H2 Purge Inlet	10/4/2006	2R21 Spring 2011	3R (54 months)
	Out	Blind Flange	RX Bldg HVAC H2 Purge & Containment Air Monitoring (CAM) Return	9/20/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8280	RX Bldg HVAC H2 Purge & CAM Return	9/20/2009	2R23 Spring 2014	3R (54 months)
	Out	2HPA-2	RX Bldg HVAC H2 Purge & CAM Return	9/20/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8271-2	RX Bldg HVAC H2 Purge Outlet	9/7/2009	2R23 Spring 2014	3R (54 months)
	In	2SV-8273-1	RX Bldg HVAC H2 Purge Outlet	9/7/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8278-1	RX Bldg HVAC H2 Purge & CAM Supply	9/7/2009	2R23 Spring 2014	3R (54 months)
	Out	Blind Flange	RX Bldg HVAC H2 Purge & CAM Supply	9/7/2009	2R23 Spring 2014	3R (54 months)
	Out	2HPA-1	RX Bldg HVAC H2 Purge & CAM Supply	9/7/2009	2R23 Spring 2014	3R (54 months)
	Out	Closed Loop 2C-128A	RX Bldg HVAC H2 Analyzer	1/31/2006	1/31/2011	60 Months

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-8	Out	2SV-5843-2	Pressurizer (Pzr) & Reactor Coolant System (RCS) Sample	9/4/2009	2R23 Spring 2014	3R (54 months)
	In	2SV-5833-1	Pzr & RCS Sample	9/4/2009	2R23 Spring 2014	3R (54 months)
2P-9	Out	2CV-6207-2	Nitrogen (N2) Supply to Safety Injection (SI) Tanks	9/29/2006	2R21 Spring 2011	3R (54 months)
	In	2N2-18	N2 Supply to SI Tanks	3/21/2008	2R22 Fall 2012	3R (54 months)
2P-14	Out	2CV-4823-2	Chemical & Volume Control (CVCS) Letdown	9/7/2009	2R23 Spring 2014	3R (54 months)
	In	2CV-4821-1	CVCS Letdown	9/18/2009	2R23 Spring 2014	3R (54 months)
2P-18	In	2CV-4846-1	CVCS Reactor Coolant Pump (RCP) Seal Water	9/6/2009	2R23 Spring 2014	3R (54 months)
	Out	2CV-4847-2	CVCS RCP Seal Water	3/29/2008	2R22 Fall 2012	3R (54 months)
	In	2PSV-1801	CVCS RCP Seal Water	3/29/2008	2R22 Fall 2012	3R (54 months)
2P-19	Out	2FP-34	Fuel Pool Refuel Canal Recirculation Line	9/8/2009	2R23 Spring 2014	3R (54 months)
2P-33	In	2CV-5082	SI Tank Drain	9/26/2006	2R21 Spring 2011	3R (54 months)
	Out	2SI-17	SI Tank Drain	9/26/2006	2R21 Spring 2011	3R (54 months)
	In	2PSV-5000	SI Tank Drain	9/26/2006	2R21 Spring 2011	3R (54 months)
	Out	2SI-5115A	SI Tank Drain	9/26/2006	2R21 Spring 2011	3R (54 months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-37	Out	2SV-5871-2	Sample Quench Tank Liquid Sample	9/7/2009	2R23 Spring 2014	3R (54 months)
	In	2SV-5878-1	Sample Quench Tank Liquid Sample	9/7/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-5876-2	Sample SI Tank Sample	9/29/2006	2R21 Spring 2011	3R (54 months)
	In	2SV-5872	Sample SI Tank Sample	9/29/2006	2R21 Spring 2011	3R (54 months)
	In	2SV-5873	Sample SI Tank Sample	9/29/2006	2R21 Spring 2011	3R (54 months)
	In	2SV-5874	Sample SI Tank Sample	9/29/2006	2R21 Spring 2011	3R (54 months)
	In	2SV-5875	Sample SI Tank Sample	9/29/2006	2R21 Spring 2011	3R (54 months)
2P-39	Out	2CV-4690-2	Quench Tank Make-Up	3/27/2008	2R22 Fall 2012	3R (54 months)
	In	2CVC-78	Quench Tank Make-Up	9/11/2009	2R23 Spring 2014	3R (54 months)
2P-40	In	2FS-37	Fire Water Supply To RX Building	3/26/2008	2R22 Fall 2012	3R (54 months)
	Out	2CV-3200-2	Fire Water Supply To RX Building	3/24/2008	2R22 Fall 2012	3R (54 months)
2P-41	Out	2CV-6213-2	N2 Addition Low Pressure (LP) N2 Supply	9/8/2009	2R23 Spring 2014	3R (54 months)
	In	2N2-1	N2 Addition LP N2 Supply	9/10/2009	2R21 Spring 2011	1R (18 months)
2P-42	Out	2PH-45	Plant Heating Rx Bldg Return	9/24/2006	2R21 Spring 2011	3R (54 months)
	In	2PH-44	Plant Heating Rx Bldg Return	9/24/2006	2R21 Spring 2011	3R (54 months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-43	Out	2SA-68	SA Rx Bldg Supply	10/16/2006	2R21 Spring 2011	3R (54 months)
	In	2SA-69	SA Rx Bldg Supply	10/16/2006	2R21 Spring 2011	3R (54 months)
2P-46	Out	2BA-217	Breathing Air Rx Bldg Supply	9/15/2009	2R23 Spring 2014	3R (54 months)
	In	2BA-216	Breathing Air Rx Bldg Supply	9/15/2009	2R23 Spring 2014	3R (54 months)
2P-48	Out	2PH-22	Plant Heating Rx Bldg Supply	9/24/2006	2R21 Spring 2011	3R (54 months)
	In	2PH-23	Plant Heating Rx Bldg Supply	3/21/2008	2R22 Fall 2012	3R (54 months)
2P-51	Out	2CV-3852-1	Chill Water Supply To Rx Bldg	10/19/2006	2R21 Spring 2011	3R (54 months)
	In	2AC-49	Chill Water Supply To Rx Bldg	10/20/2006	2R21 Spring 2011	3R (54 months)
2P-52	Out	2CV-5236-1	Component Cooling Water To RCP Coolers	9/12/2009	2R23 Spring 2014	3R (54 months)
	In	2PSV-5249	Component Cooling Water To RCP Coolers	9/12/2009	2R23 Spring 2014	3R (54 months)
	In	2CCW-38	Component Cooling Water To RCP Coolers	9/21/2009	2R21 Spring 2011	1R (18 months)
2P-53	In	Blind Flange	Outage Use	9/19/2009	2R23 Spring 2014	3R (54 months)
	Out	Blind Flange	Outage Use	9/19/2009	2R23 Spring 2014	3R (54 months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-58	Out	2SV-8261-2	Rx Bldg HVAC CAM Discharge	9/5/2009	2R23 Spring 2014	3R (54 months)
	In	2SV-8259-1	Rx Bldg HVAC CAM Discharge	9/3/2009	2R23 Spring 2014	3R (54 months)
	Out	2C-128B	Rx Bldg HVAC Hydrogen (H2) Analyzer Closed Loop	9/5/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8260-2	Rx Bldg HVAC CAM Supply & Return	9/3/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8262-2	Rx Bldg HVAC CAM Supply & Return	9/4/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-8263-2	Rx Bldg HVAC CAM Suction	9/4/2009	2R23 Spring 2014	3R (54 months)
	In	2SV-8265-1	Rx Bldg HVAC CAM Suction	9/4/2009	2R23 Spring 2014	3R (54 months)
2P-59	Out	2CV-3851-1	Chilled Water Rx Bldg Return	3/30/2008	2R22 Fall 2012	3R (54 months)
	In	2PSV-3805	Chilled Water Rx Bldg Return	3/30/2008	2R22 Fall 2012	3R (54 months)
	In	2CV-3850-2	Chilled Water Rx Bldg Return	3/30/2008	2R22 Fall 2012	3R (54 months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-60	Out	2CV-5255-1	Component Cooling Water From RCP Coolers	9/13/2009	2R23 Spring 2014	3R (54 months)
	In	2CV-5154-2	Component Cooling Water From RCP Coolers	9/13/2009	2R23 Spring 2014	3R (54 months)
	In	2PSV-5256	Component Cooling Water From RCP Coolers	9/13/2009	2R23 Spring 2014	3R (54 months)
2P-61	In	Blind Flange	Instrument Air (IA) Integrated Leak Rate Test (ILRT) Sensing Lines	9/14/2009	2R26 Fall 2018	6R (108 Months)
	Out	2IA-88	IA ILRT Sensing Lines	9/14/2009	2R23 Spring 2014	3R (54 months)
	In	Blind Flange	IA ILRT Sensing Lines	9/14/2009	2R26 Fall 2018	6R (108 Months)
	Out	2IA-89	IA ILRT Sensing Lines	9/14/2009	2R23 Spring 2014	3R (54 months)
2P-62	In	Blind Flange	IA ILRT Pressure	9/14/2009	2R26 Fall 2018	6R (108 Months)
	Out	Blind Flange	IA ILRT Pressure	9/14/2009	2R26 Fall 2018	6R (108 Months)
2P-66	Out	2SV-5633-1	Post Accident Sampling Sys Return & Rx Bldg Sump Suction	9/2/2009	2R23 Spring 2014	3R (54 months)
	Out	2SV-5633-2	Post Accident Sampling Sys Return & Rx Bldg Sump Suction	9/2/2009	2R23 Spring 2014	3R (54 months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2P-67	Out	2SV-5634-1	Post Accident Sampling Supply & Rx Bldg Sump Suction	9/3/2006	2R23 Spring 2014	3R (54 months)
	Out	2SV-5634-2	Post Accident Sampling Supply & Rx Bldg Sump Suction	9/3/2006	2R23 Spring 2014	3R (54 months)
2P-68	Out	2CV-2061-2	Containment Sump Drain	9/5/2009	2R21 Spring 2011	1R (18 months)
	Out	2PSV-2000	Containment Sump Drain	9/5/2009	2R21 Spring 2011	1R (18 months)
	In	2CV-2060-1	Containment Sump Drain	9/19/2009	2R21 Spring 2011	1R (18 months)
2P-69	Out	2CV-2201-2	Boron Mgmt Reactor Drain Tank (RDT) Discharge	3/31/2008	2R21 Spring 2011	3R (54 months)
	In	2PSV-2200	Boron Mgmt RDT Discharge	3/31/2008	2R22 Fall 2012	3R (54 months)
	In	2CV-2202-1	Boron Mgmt RDT Discharge	10/7/2006	2R23 Spring 2014	3R (54 months)
2V-1	Out	2CV-8284-2	HVAC Containment Bldg Purge Inlet	9/21/2009	2R21 Spring 2011	1R (18 Months)
	Out	2CV-8483-1	HVAC Containment Bldg Purge Inlet	9/21/2009	2R21 Spring 2011	1R (18 Months)
2V-2	Out	2CV-8286-2	HVAC Containment Bldg Purge Return	9/21/2009	2R21 Spring 2011	1R (18 Months)
	Out	2CV-8285-1	HVAC Containment Bldg Purge Return	9/21/2009	2R21 Spring 2011	1R (18 Months)
2C-1	In/Out	2C-1	RX Bldg Access Equipment Hatch	9/20/2009	2R21 Spring 2011	1R (18 Months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2C-2	Out	2C-2	RX Bldg Access Emergency Escape Hatch Barrel	9/18/2009	2R21 Spring 2011	1R (18 Months)
	In	2C-2	RX Bldg Access Emergency Escape Hatch Inner Door Seal	9/18/2009	2R21 Spring 2011	1R (18 Months)
	Out	2C-2	RX Bldg Access Emergency Escape Hatch Outer Door Seal	9/18/2009	2R21 Spring 2011	1R (18 Months)
2C-3	In/Out	2C-3	Fuel Transfer System Fuel Transfer Tube Blind Flange	9/19/2009	2R21 Spring 2011	1R (18 Months)
2C-4	Out	2C-4	RX Bldg Access Personnel Hatch Barrel	9/20/2009	2R21 Spring 2011	1R (18 Months)
	In	2C-4	RX Bldg Access Personnel Hatch Inner Door Seal	9/8/2010	2R21 Spring 2011	1R (18 Months)
	Out	2C-4	RX Bldg Access Personnel Hatch Outer Door Seal	9/8/2010	2R21 Spring 2011	1R (18 Months)
2E-1	In/Out	2E-1	Safeguard (SFGRD) (2WR-26-1) Electrical Penetration	7/27/2006	2R24 Fall 2015	6R (108 Months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2E-4	In/Out	2E-4	SFGRD (2WR-42-1) Electrical Penetration	7/25/2006	2R24 Fall 2015	6R (108 Months)
2E-5	In/Out	2E-5	SFGRD (2WR-43-3) Electrical Penetration	7/26/2006	2R24 Fall 2015	6R (108 Months)
2E-6	In/Out	2E-6	SFGRD (2WR-25-1) Electrical Penetration	7/25/2006	2R24 Fall 2015	6R (108 Months)
2E-7	In/Out	2E-7	SFGRD (2WR-25-3) Electrical Penetration	7/26/2006	2R24 Fall 2015	6R (108 Months)
2E-8	In/Out	2E-8	SFGRD (2WR-25-5) Electrical Penetration	7/26/2006	2R24 Fall 2015	6R (108 Months)
2E-9	In/Out	2E-9	SFGRD (2WR-27-1) Electrical Penetration	7/24/2006	2R24 Fall 2015	6R (108 Months)
2E-10	In/Out	2E-10	SFGRD (2WR-40-1) Electrical Penetration	7/25/2006	2R24 Fall 2015	6R (108 Months)
2E-11	In/Out	2E-11	SFGRD (2WR-41-1) Electrical Penetration	7/25/2006	2R24 Fall 2015	6R (108 Months)
2E-14	In/Out	2E-14	SFGRD (2WR-25-7) Electrical Penetration	7/25/2006	2R24 Fall 2015	6R (108 Months)
2E-22	In/Out	2E-22	NON-SFGRD (2WR-23-1) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-23	In/Out	2E-23	NON-SFGRD (2WR-24-1) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2E-24	In/Out	2E-24	NON-SFGRD (2WR-23-2) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-25	In/Out	2E-25	NON-SFGRD (2WR-26-3) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-27	In/Out	2E-27	NON-SFGRD (2WR-21-1) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-28	In/Out	2E-28	NON-SFGRD (2WR-28-1) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-32	In/Out	2E-32	NON-SFGRD (2WR-27-3) Electrical Penetration	5/18/2009	2R26 Fall 2018	6R (108 Months)
2E-33	In/Out	2E-33	SFGRD (2WR-42-3) Electrical Penetration	5/19/2009	2R26 Fall 2018	6R (108 Months)
2E-34	In/Out	2E-34	NON-SFGRD (2WR-43-1) Electrical Penetration	5/19/2009	2R26 Fall 2018	6R (108 Months)
2E-35	In/Out	2E-35	NON-SFGRD (2WR-43-5) Electrical Penetration	5/19/2009	2R26 Fall 2018	6R (108 Months)
2E-36	In/Out	2E-36	NON-SFGRD (2WR-21-3) Electrical Penetration	5/19/2009	2R26 Fall 2018	6R (108 Months)
2E-41	In/Out	2E-41	SFGRD (2WR-25-2) Electrical Penetration	1/8/2008	2R25 Spring 2017	6R (108 Months)
2E-42	In/Out	2E-42	SFGRD (2WR-43-2) Electrical Penetration	1/7/2008	2R25 Spring 2017	6R (108 Months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2E-43	In/Out	2E-43	SFGRD (2WR-42-2) Electrical Penetration	1/7/2008	2R25 Spring 2017	6R (108 Months)
2E-44	In/Out	2E-44	SFGRD (2WR-41-2) Electrical Penetration	1/7/2008	2R25 Spring 2017	6R (108 Months)
2E-45	In/Out	2E-45	SFGRD (2WR-26-2) Electrical Penetration	9/3/2009	2R21 Spring 2011	1R (18 Months)
2E-50	In/Out	2E-50	SFGRD (2WR-25-6) Electrical Penetration	1/8/2008	2R25 Spring 2017	6R (108 Months)
2E-51	In/Out	2E-51	SFGRD (2WR-25-4) Electrical Penetration	1/8/2008	2R25 Spring 2017	6R (108 Months)
2E-53	In/Out	2E-53	SFGRD (2WR-40-2) Electrical Penetration	1/7/2008	2R25 Spring 2017	6R (108 Months)
2E-54	In/Out	2E-54	SFGRD (2WR-27-2) Electrical Penetration	1/7/2008	2R25 Spring 2017	6R (108 Months)
2E-55	In/Out	2E-55	NON-SFGRD (2WR-21-4) Electrical Penetration	3/13/2005	2R23 Spring 2014	6R (108 Months)
2E-59	In/Out	2E-59	NON-SFGRD (2WR-22-2) Electrical Penetration	3/2/2005	2R23 Spring 2014	6R (108 Months)
2E-60	In/Out	2E-60	NON-SFGRD (2WR-22-1) Electrical Penetration	2/28/2005	2R23 Spring 2014	6R (108 Months)
2E-61	In/Out	2E-61	NON-SFGRD (2WR-26-4) Electrical Penetration	2/28/2005	2R23 Spring 2014	6R (108 Months)

Pen. No.	In / Out Board	Component No.	Component Description	Last Test Date	Next Test Due Date	Current Test Frequency
2E-63	In/Out	2E-63	NON-SFGRD (2WR-21-2) Electrical Penetration	3/13/2005	2R23 Spring 2014	6R (108 Months)
2E-66	In/Out	2E-66	NON-SFGRD (2WR-43-4) Electrical Penetration	8/18/2006	2R24 Fall 2015	6R (108 Months)
2E-67	In/Out	2E-67	NON-SFGRD (2WR-42-4) Electrical Penetration	8/17/2006	2R24 Fall 2015	6R (108 Months)
2E-71	In/Out	2E-71	NON-SFGRD (2WR-27-4) Electrical Penetration	2/28/2005	2R23 Spring 2014	6R (108 Months)

TABLE 2.1-2
TYPE B AND TYPE C PERFORMANCE RESULTS FROM LAST TWO ANO-2 REFUELING OUTAGES (2R19 AND 2R20)

	Pathway Leakage (sccm)			
	As-Found Minimum		As-Left Maximum	
Penetration	2R19	2R20	2R19	2R20
2P-6	457	117	2942	531
2P-8	52	13	108	108
2P-9	63	63	98	98
2P-14	27	11	361	360
2P-18	310	367	580	580
2P-19	39	30	39	30
2P-33	375	375	745	745
2P-37	117	72	169	118
2P-39	34	52	52	88
2P-40	69	310	610	610
2P-41	129	350	513	400
2P-42	10	10	1200	1200
2P-43	5	5	225	225
2P-46	10	0	28	6
2P-48	40	40	950	950
2P-51	8	8	82	82
2P-52	2440	1580	2720	2980
2P-53	36	6	71	11
2P-58	261	175	367	296

	Pathway Leakage (sccm)			
	As-Found Minimum		As-Left Maximum	
Penetration	**2R19**	**2R20**	**2R19**	**2R20**
2P-59	480	365	370	370
2P-60	175	715	460	920
2P-61A	3	44	6	87
2P-61B	21	9	42	17
2P-62	3	0	5	0
2P-66	18	0	151	63
2P-67	4	5	109	111
2P-68	1520	3500	1520	3500
2P-69	248	78	88	88
2V-1	195	3	195	1209
2V-2	2	3	2	2
2C-1	261	290	2020	1190
2C-2	110	3	220	1030
2C-3	4	28	4	28
2C-4	94	430	187	83
2E-1	0	0	0	0
2E-4	0	0	0	0
2E-5	0	0	0	0
2E-6	0	0	0	0
2E-7	0	0	0	0
2E-8	8	8	8	8

	Pathway Leakage (sccm)			
	As-Found Minimum		As-Found Maximum	
Penetration	**2R19**	**2R20**	**2R19**	**2R20**
2E-9	1	1	1	1
2E-10	1	1	1	1
2E-11	0	0	0	0
2E-14	1	1	1	1
2E-22	2	0	2	0
2E-23	0	0	0	0
2E-24	6	3	6	3
2E-25	2	2	2	2
2E-27	0	2	0	2
2E-28	5	2	5	2
2E-32	0	1	0	1
2E-33	1	0	1	0
2E-34	0	2	0	2
2E-35	0	3	0	3
2E-36	1	3	1	3
2E-41	0	0	0	0
2E-42	0	0	0	0
2E-43	0	0	0	0
2E-44	0	0	0	0
2E-45	183	272	183	1
2E-50	0	0	0	0

	Pathway Leakage (sccm)			
	As-Found Minimum		As-Found Maximum	
Penetration	**2R19**	**2R20**	**2R19**	**2R20**
2E-51	0	0	0	0
2E-53	0	0	0	0
2E-54	0	0	0	0
2E-55	1	1	1	1
2E-59	13	13	13	13
2E-60	0	0	0	0
2E-61	0	0	0	0
2E-63	1	1	1	1
2E-66	0	0	0	0
2E-67	1	1	1	1
2E-71	0	0	0	0
Totals	**7847**	**9372**	**17466**	**18162**

TABLE 2.1-3
SUMMARY OF CONTAINMENT PENETRATIONS THAT DID NOT DEMONSTRATE ACCEPTABLE PERFORMANCE

2R19

Component (Penetration)	Test Interval	Administrative Limit	As-Found Leakage	Cause / Corrective Action	As-Left Leakage
2CV-2061-2 / 2PSV-2000 (Penetration 68 Outboard)	18 months	2500 sccm	4700 sccm	Debris / Air Purge	370 sccm
2C-1 (Equipment Hatch)	18 months	600 sccm	261 sccm	Torqued Equipment Hatch Closure	2020 sccm

2R20

Component (Penetration)	Test Interval	Administrative Limit	As-Found Leakage	Cause / Corrective Action	As-Left Leakage
2CV-2061-2 / 2PSV-2000 (Penetration 68 Outboard)	18 months	2500 sccm	6000 sccm	Debris / Air Purge	2370 sccm
2CV-2060-1 (Penetration 68 Inboard)	60 months prior to 2R20. Test interval reduced to 18 months	3000 sccm	3500 sccm	Debris / Air Purge	3500 sccm
2N2-1 (Penetration 41 Inboard)	18 months	1500 sccm	Not measureable	Insufficient air flow to close check valve. Changed test procedure to use higher capacity pressurization source.	400 sccm

Component (Penetration)	Test Interval	Administrative Limit	As-Found Leakage	Cause / Corrective Action	As-Left Leakage
2CCW-38 (Penetration 52 Inboard)	60 months prior to 2R20. Test interval reduced to 18 months	7000 sccm	Not measureable	Insufficient air flow to close check valve. Changed test procedure to use higher capacity pressurization source.	2300 sccm
2E-45 (Electrical Penetration)	18 months	200 sccm	272 sccm	Module “D” repaired with new seals	1 sccm
2C-1 (Equipment Hatch)	18 months	600 sccm	290 sccm	Torqued Equipment Hatch Closure	1190 sccm

3.1 The discussion of PRA quality relies on a Peer Review of the ANO2 Probabilistic Risk Analysis (PRA). For the ANO2 PRA model used to support the application, please

(a) Provide a list of findings from the ANO2 PRA peer review relevant to this submittal

A full-scope Regulatory Guide (RG) 1.200 peer review for the ANO-2 PRA was performed by Westinghouse Owners Group in 2008 and the final report issued July 30, 2008.

The peer review findings that affect Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) values could be relevant to this submittal. Table 3.1-1 of this attachment provides a list of all findings from the ANO-2 PRA peer review and the column "ILRT Relevant" illustrates which finding is relevant to this submittal. The column "Reason for Not Relevant" describes the reason why screened findings and observations (F&Os) are not relevant to this submittal.

(b) Explain how these items were addressed for this application.

Table 3.1-1 also shows the list of findings from the ANO-2 PRA peer review which could be relevant to this submittal and column "Finding Disposition" shows how the relevant individual findings were evaluated and addressed. There are no open peer review comments that significantly affect the risk results provided in the ILRT analysis.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
IE-C3-01	IE-C3	Yes	Issue: ANO2 explicitly calculated the total reactor critical years as total reactor critical hours divided by 8766 hours per year and used this to calculate the Initiating Events Frequencies (IEFs). However, there is no evidence that ANO2 adjusted these IEFs to reflect average plant availability. This is, in essence, equivalent to assuming that the plant operates at full power all year. ANO2 needs to adjust their initiating event frequencies to account for average plant availability.		The Risk increase calculation for ILRT extension application used the initiating event frequencies based on reactor critical hours rather than calendar hours for conservative estimation of risk increase This makes conservatism for risk increase estimation about 10%
IE-C10-01	IE-C10	No	No comparison of results to generic data sources was provided with a discussion and explanation of the differences. This is a requirement to meet IE C-10 and is important to assessing the validity of the initiating event frequency results. The ISLOCA IEF needs to be reviewed, compared and understood. This IEF value is very low. Compare the results to the generic values in NUREG/CR-5750 and NUREG/CR-6928, and provide and explain any significant differences.	A comparison of IE frequencies to the generic frequencies is primarily a documentation issue. Performance of this review for other sites found only that the change was that the Instrument Air initiator needs to account for major system leaks and not just hardware failures. Since the instrument air system is not a major contributor to CDF, this change would not impact PSA applications. The ISLOCA frequencies mentioned in the finding have been addressed in another finding (IE-C12-01) and are corrected in the model.	
IE-C12-01	IE-C12	Yes	Some of the components in the ISLOCA fault tree model appear to have incorrect mission times. The Low Pressure Safety Injection (LPSI) Motor Operated Valve (MOV), e.g. 2CV5017 rupture, has a mission time of 36 hrs. However, the mission time should probably be 8760 hours because the MOV rupture is not likely to be annunciated in the control room as assumed. Therefore, it could potentially be in an undetected failed state for an extended period. The same comment may apply to the second check valve. It could be potentially in an undetected failed state for an extended period. Reconsider and change the mission times for the time the downstream valves can be in an undetected state.		The ISLOCA mission times were reviewed and this change has been incorporated in the model used for PSA Applications.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
IE-D1-01	IE-D1	No	Some of the documentation is not adequate to meet this requirement. The following items should be addressed: (1) What is the basis for the 80/20 split between reactor trip and turbine trip events? (Assumption 8, Section 2.2 and Section 5.1 page 19). (2) Where is the documentation for the small and medium break sizes that are used in the model? The lower limit for the large LOCA break size has a reference (see Table 2). (3) Appendix C contains calculations for loss of feedwater/condensate (T2). Page 48 contains the Bayesian update for this event. Recommend explaining how these are used in the PRA model and which is used in the base model. The value in Table 7 appears to be from the Bayesian update which is inconsistent with the discussion in Section 5.3.1. (4) Table 7: It's not clear where the frequencies for T500KV and TST3 come from. This should be explained. (5) The RR file with the quantification information contains frequencies for the following events that are not in the IE documentation: T3SD, T3SW, TSDCA, TSDCAML, TSDCB, TSDCBML, TSDCISO, V5+, and VS+ . (6) Loss of Lake Dardanelle IE - need to document the change from 2E-04/yr to 1E-05/yr - it should be explained how the IE frequency for this event was reduced to 1E-05/yr. Provide documentation for the above six items.	These issues identified for this SR are primarily documentation issues and do not impact the results of the analysis. Entergy will be revising the documentation, at a future date to address these issues. However, it is not expected that any new information will be forthcoming that will significantly change the frequencies of initiators. The information below presents some preliminary discussions relating to each individual item identified for this SR. 1) The 80/20 split for Reactor trip vs. turbine trip is based on the data from table D-4 of NUREG/CR-5750 and ANO2 trip history. 2) The LOCA break sizes are determined in the Accident Sequence calculation and are not expected to change significantly 3) The Feedwater/Condensate initiator tree is used strictly for (a)(4) evaluations with feedwater components out of service. The Bayesian data is used for the PRA. 4) T500KV is partial LOSP and is developed based on actual LOSP data. TST3 is a transformer failure and is based on the hardware failure of the transformer during a year. 5) The V* and VS* initiators are ISLOCA events that are discussed in the ISLOCA calculation. The remaining events are used for a LPSD model that is not part of the Initiating Event calculation. 6) The Loss of Lake initiator is reduced based on the conservatisms in the design calculation performed.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
AS-A4-01	AS-A4	No	Even though some operator actions required to achieve the identified success criteria are mentioned in portions of the initiating event analyses, these operator actions are not consistently identified and documented. Entergy should explicitly identify all operator actions needed to achieve the success criteria for each of the key safety functions defined for the modeled initiating events.	This is a documentation issue. The operator actions are included in the fault tree and are consistent with the plant design and procedures. The actions are primarily discussed in the system notebooks rather than the accident sequence.	
AS-A5-01	AS-A5	No	There is no reference to the System design, Emergency Operating Procedures (EOPs), or abnormal procedures in the accident sequence notebook. It would be helpful if the EOP or abnormal procedure used for each accident sequence was noted. Add a table showing the EOPs or abnormal procedures used for each accident sequence.	The ANO-2 event trees and fault trees are consistent with the EOPs and AOPs (and consistent with industry events). Therefore, the incorporation of this finding is not expected to change any accident progression as addressed in the PSA.	
AS-A10-01	AS-A10	No	The operation actions are not specified in either the accident sequence detailed description or the event tree. An example would be a detailed discussion of the once through cooling and the operator actions required. Specify the operator actions in either the accident sequence detailed description	This is a documentation issue. The operator actions are included in the fault tree and are consistent with the plant design and procedures. The actions are primarily discussed in the system notebooks rather than the accident sequence.	
AS-B1-01	AS-B1	No	The special initiators do not address the impact of these initiators on the mitigating systems.	ANO-2 uses a linked fault tree approach where the initiating events are placed in the tree with the appropriate system model. A table will be added to the accident sequence report to show how the IE fails both the front line and support systems. This finding will not impact any applications.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
AS-B2-01	AS-B2	No	The dependencies are not addressed in the Accident Sequence notebook. This is especially true of operator actions and how the failure of an operator action would affect subsequent operator actions.	Dependencies between operator actions are addressed in the HRA report and are not discussed explicitly in the Accident Sequence. Other dependencies are modeled directly in the fault tree. Therefore, this finding will have no impact on any applications.	
AS-B3-01	AS-B3	No	No assumption or statement is made that plant equipment will perform in the environment for which it was designed. There also was no evidence that equipment not specified in the Safety Analysis Report (SAR) for accident mitigation but still credited in the PRA were reviewed for environmental affects. This could be an assumption that the equipment meets the environmental qualification. Equipment that is not environmentally qualified need to be analyzed on the impact they have on the applicable accident sequence.	Thus far Entergy's review of the systems credited for ANO-2 identified no cases where equipment was assumed to operate in harsh environments beyond design bases conditions without justification. However, it is noted that additional effort is required to ensure that this issue is properly considered and documented . In relation to this application, it can be concluded that any effect of failing equipment inside containment due to a harsh environment will only serve to increase the risk of LERF. Since the delta risk for the ILRT application is related to the delta between CDF and LERF (CDF-LERF), any issues that might be identified during additional review of this issue would only serve to remove conservatism from the current analysis (i.e. increase LERF resulting in a smaller delta risk for the ILRT extension). Therefore, the conclusion of the current ANO-2 ILRT interval extension analysis, will not be affected by any issues relating to this finding.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
AS-B6-01	AS-B6	Yes	This SR was not met because there was no discussion of the following: changes in environmental conditions, shifting of the Condensate Storage Tanks (CSTs), and operator actions. Questions were raised in that ANO2 uses 40 minutes as the time that the Reactor Coolant Pump (RCP) can run without Component Cooling Water (CCW) cooling. The industry practice (WCAP-16175) uses 20 minutes. This difference should be analyzed and resolved. Discuss the following: changes in environmental conditions, shifting of the CSTs, and operator actions.		ANO-2 will change the mission time for the RCPs without cooling to 20 minutes to be consistent with the WCAP. However, previous CE reports showed that the RCPs could operate for 40 minutes to an hour without cooling. The WCAP change is based on concerns with the Westinghouse RCP seals and a regulatory desire to have a consistent time to restore cooling to the RCPs. Therefore, the current analysis is believed to be more realistic (although it is not consistent with current WCAP guidance.)
AS-C2-01	AS-C2	No	The documentation does not show that the items in this SR have been addressed. Address all the items in this SR in the assumption section.	This is a documentation finding concerning the issues addressed above. Therefore, this finding will not impact any applications.	
SY-A4-01	SY-A4	No	ANO2 has a System Notebook Database as part of their overall PSA documentation system. The System Notebook entries for EFW, SW and the AC Power System were reviewed against the list of information provided in the SR. There was no specific entry in the reviewed notebooks that address performing plant walkdowns and interviews with system engineers and plant operators to confirm that the systems analysis correctly reflects the as-built, asoperated plant Walkdowns will need to be performed in order to support National Fire Protection Association (NFPA) 805 Fire PRA and Flooding initiator. This SR can be accomplished during this process.	Numerous walkdowns have been performed in past updates, but have not been documented. Walkdowns have been performed for Internal Flooding and Fire PRA. The model will not change as a result of walkdowns. In addition, the documentation of the system notebooks will be changed to better accommodate documentation of the walkdowns.	
SY-A8-01	SY-A8	Yes	The EDG air start system is included in the component boundary of the EDG for failure rate and common cause but is still modeled in the fault tree with non-zero probabilities.		This SR has been addressed in the current model. The diesel air start components were set to 0 to address the diesel boundary issue.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
SY-B8-01	SY-B8	No	No documentation of spatial and environmental hazards assessment was found.	As stated in the response to SY-A4-01, walkdowns have been performed. Therefore, this is only documentation issue. Spatial and environmental hazards information was considered in the system model development. In addition, the internal flooding evaluation addressed failures do to spray and flooding of components in the vicinity of the failure.	
HR-C2-01	HR-C2	No	CC-I was assessed to be met, but there is no direct evidence that ANO2 evaluated plant-specific or generic operating experience to check for other pre-initiators. Documentation of a review of plant specific information or industry Licensee Event Reports (LERs) from other similar plants and incorporating this information into the HRA assessment is required to receive a CC-II/III rating. Incorporate an assessment of the plant-specific or generic operating experience information into the HRA assessment.	Thus far, a preliminary review of LERs has not identified any additional pre-initiator human errors that are not currently included in the current model. A detailed review will be performed as part of the next model update, however, it is not expected that this issue has any impact on this application.	
HR-D3-01	HR-D3	No	Not assessed consistent with CC II since the evaluation does not provide an assessment of the quality of the procedures or the quality of the human-machine interface. Provide an assessment of the quality of the procedures and the human-machine interaction. If this has been done, provide the documentation.	A review of the HRA spreadsheet indicates that the analyst has reviewed the referenced procedures and subsequent processes (man-machine interface), and has demonstrated an understanding of both to prepared the "Failure Context" section for each HFE. Thus, while the level of "quality" is not explicitly called out, the review and extraction of information is sufficient to imply that the procedures and interfaces are at an acceptable "quality" level. Therefore, this issue has no impact on this application.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
HR-D6-01	HR-D6	Yes	ANO2 uses the HRA Toolbox for quantifying their pre-initiator HEPs. For the pre-initiator HEPs, ANO2 basically uses the ASEP approach and treats the ASEP Basic HEPs as means with the associated error factors. However, as defined on page xv of NUREG/CR-4772, the ASEP BHEP values are medians for a log-normal distribution. Thus, the treatment of the BHEP values for the pre-initiators is mathematically incorrect.		The pre-initiator HRA values have been converted from medians to means in the updated analysis. This change made little difference in the core damage frequency since the pre-initiator HRAs are not a major contributor to risk. This change is included for all model applications.
HR-G6-01	HR-G6	No	This SR requires a check of consistency of the post-initiator HEP quantification. This requires a review of the HFEs and their final HEPs relative to each other to check their reasonableness. There is no evidence that this consistency check has been done. If done this should be documented, if not done this should be completed. This can be addressed by adding an explicit process for reviewing the HEPs for internal consistency with respect to scenario, context, procedures and timing. Specifically this can evaluate the HEPs with respect to certain expected patterns such as increasing HEPs with decreasing time available, increasing HEPs with increasing stress levels, and increasing HEPs with increasing complexity of the procedures for accomplishing the desired successful outcome. A statement that such an evaluation was performed and, where there were deviations from the expected patterns and either provides a basis for the deviation or what was done to correct it.	The post-initiator human actions were reviewed to verify that the values are reasonable and consistent based on the time available, the complexity of the decision-making process, and the complexity of the task. If the probability was questionable, the spreadsheets were reviewed to determine which element dominated the risk and changes were made to either correct or explain the discrepancies	
HR-G9-01	HR-G9	Yes	This requires the use of means values. NUREG-1278 contains median values that do not appear to be converted to means before being used in the ANO2 PRA. For example, spread sheet used for HRA at ANO2.		The post-initiator execution errors were converted from medians to means. However, the changes made a very minor impact on the HEPs. This change is included for all model applications.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
DA-A1a-01	DA-A1a	Yes	Boundary developed for EDG starting air was outlined in PRA-ES-01-003 included the start air system inside the component boundary. The CAFTA model had the starting air modeled with Basic Events (BEs) set greater than zero, effectively placing the starting air outside the component boundary. See F&O SY-A8-04 for details. See F&O SY-A8-04		This SR has been addressed in the current model. The diesel air start components were set to 0 to address the diesel boundary issue. Therefore, this finding has been addressed for applications.
DA-C10-01	DA-C10	Yes	CAT I given based on information listed in Procedure PRA-A2-01-003S05 does not address decomposing the component failure mode into sub-elements (or causes) that are fully tested, then using tests that exercise specific sub-elements in their evaluation. May be over-counting demands and run-hours for component boundaries that are not tested during evolution. Need to review component boundaries and tests counted in data collection to ensure that one sub-element does not have many more successes than another. Update procedure CE-P-05.07 with process details that ensure the requirements described in CAT II/III are met.		The data collection is consistent with the Maintenance Rule process. The MR process does not count these demands and run-hours. Therefore, while there may be some discrepancies in the data counting, these discrepancies are not expected to significantly impact any risk quantifications. Note that Bayesian analysis will compensate for these discrepancies by averaging the risk closer to the generic failure rates.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
DA-C12-01	DA-C12	No	Procedure PRA-A2-01-003S05 addresses evaluating maintenance outage as a function of plant status. CAT I given since there is no evidence of INTERVIEW the plant maintenance and operations staff to generate estimates of ranges in the unavailable time per maintenance act for components, trains, or systems for which the unavailabilities are significant basis events. As a suggestion, need to include interviews and shared equipment between ANO1 and ANO2 (i.e., air compressors) in procedure PRA-A2-01-003S05 Need to document interviews in order to meet Category II/III. Update procedure CE-P-05.07 with process to perform interviews with plant maintenance and operations staff to generate estimates of ranges in the unavailable time per maintenance act for components, trains, or systems for which the unavailabilities are significant basis events. Document interviews.	System engineers and other plant personnel discussions were performed throughout the data update process. Therefore, although a formal interview with plant operations and maintenance was not documented, the information has been gathered and used in the data update process.	
IF-A1-01	IF-A1	No	At the time of the peer review, the ANO2 IF analyses had not been completed to the point that it could be reviewed. Entergy intends to use the same IF methodology for all three of their PWRs with the Waterford-3 plant being the lead plant. The Waterford-3 IF analysis had been completed. Entergy requested that the peer review team review the IF methodology for Waterford to confirm that the methodology met the standard. Entergy needs to complete the ANO2 IF analyses using the Waterford-3 methodology. Entergy will need to specifically address dual unit issues for ANO1 and ANO2.	The ANO-2 Internal Flooding Analysis has been completed. The insights gained from the Waterford Peer Review were used to develop the ANO-2 internal flooding analysis. In addition, the process used for the ANO-2 internal flooding analysis was also used to develop the ANO-1 internal flooding analysis which has also been peer reviewed. The ANO-2 analysis has been developed to meet the standard requirements. The analysis incorporates updated walkdowns and quantifies scenarios that were screened out in previous revisions.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
IF-C2c-01	IF-C2c	No	Equipment height off floor appears to be not recorded for most of the equipment on the walk down sheets. For example, flood area TB-15-250 walkdown sheet on page 460 only 3 of 26 items listed include a height. Spatial location in the area (for example height off floor) and any flooding mitigative features (e.g., shielding, flood or spray capability ratings) is not recorded for most of the PRA components listed on the walkdown sheets. Therefore, for a particular flood height in a room, it is not clear whether or not a component is affected. Complete the walkdown sheets.	Since the time that the Peer Review was performed, the walkdown sheets have updated to document the spatial information relating to the components within the flood zones. These spatial impacts have been included in the flooding walkdown reports and documented for the ANO-2 analysis.	
IF-C3-01	IF-C3	No	The walk down sheets identify the components located inside the flood area. This SR requires that components in a flood area be identified and include whether the component is susceptible to failure by submergence or spray. The walkdown sheets are formatted to allow recording whether or not the component is vulnerable to spray. Only several walkdown sheets have the column filled out for vulnerability to spray. It is not clear whether blanks indicate not susceptible to spray or not.	The walkdown sheets for the ANO-2 analysis have been updated to be more comprehensive in the identification of those components vulnerable to spray. While most forms are complete in depicting the components susceptibility to spray, some entry's remain blank and are in need of updating. This lack of completeness in the documentation does not affect the ILRT extension application.	
IF-D6-01	IF-D6	No	Operator error contributions to flooding are discussed at a very high level. However, basically the only floods considered were catastrophic failures. The flood scenario frequencies were quantified using generic pipe rupture data and plant-specific pipe length. The generic flood frequency sources do not include floods cause by human actions during maintenance. While the operator induced floods may be less severe than the catastrophic pipe failure floods, the frequencies will be higher so should be considered explicitly.	While the need to assess human induced floods in relation to the application of the generic data is important for ensuring that the flood frequency is inclusive, the inclusion of these human induced floods has no bearing on the analysis in support of the ILRT extension request.	

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
QU-F4-01	QU-F4	No	Selection process for determining important assumptions and sources of uncertainty was not delineated.	ANO-2 did a full scope sensitivity and uncertainty analysis on the current model. At the time of the peer review, no process for determining important assumptions existed for the industry. Since the latest EPRI report on sources of uncertainty was published, the ANO-2 sensitivity analyses compare favorably with the issues identified by EPRI.	
LE-D1b-01	LE-D1b	No	There is no evidence of an evaluation of the impact of the accident progression conditions on containment seals, penetrations, etc. The model this is based on is related to NUREG/CR-6595 so consistency with NUREG/CR-6595 meets CC-I, but there is no discussion of the accident progression conditions on these elements. Provide a discussion or assessment of the accident progression conditions on the containment conditions noted in the SR.	The LERF analysis meets the requirements of NUREG/CR-6595. This methodology is considered acceptable for model applications.	
LE-D6-01	LE-D6	Yes	Containment isolation is addressed by top event (question) 3. This is based on a calc that is noted not to have been maintained up to date. Since it has not been maintained up-to-date, there is no confidence that the analysis represents a realistic assessment; therefore, this does not meet CC II. The containment isolation calc needs to be updated or demonstrated (confirmed) to be up to date. This should include an assessment of the containment penetrations to provide an assessment of the total number of penetrations required to provide a realistic evaluation of containment isolation reliability.		The containment isolation analysis is typically not expected to change significantly during the periods between model updates. Additional containment penetrations have not been added. Therefore, the model update is not expected to increase the failure probability of containment isolation.

Finding No	Review Element	ILRT Relevant	Finding	Reason for Not Relevant	Finding Disposition
LE-E4-01	LE-E4	No	Although the majority of the SR requirements in these three top high level requirements are met, there is no indication that dependencies between multiple HFEs have been addressed. The Level 1 assessment completed an evaluation of the dependencies between human actions in the model. A similar analysis should be completed for the human actions in the Level 2 analyses and between the Level 2 and Level 1 analyses to ensure all HEP dependencies are identified and addressed appropriately.	The Level 2 PRA only adds a small number of human actions, primarily associated with containment isolation. Therefore, any new HRA combinations that may have dependencies that are not accounted for are not expected to have a significant impact on raising the LERF.	
LE-F1b-01	LE-F1b	No	There is no documented evidence that ANO2 compared their LERF results to the results of other similar plants to confirm the reasonableness of the results with respect to relative contribution and frequency and ranking of contributors.	Upon review of the Waterford-3 LERF analysis, the comparison to a similar plant is not expected to identify additional sources of LERF than have previously been identified.	
MU-B4-01	MU-B4	No	There is no reference to a peer review for upgrades. Procedure EN-DC-151, PSA Maintenance and Update, could be revised to include the requirement for a peer review when the PSA is upgraded. It should be noted that a PSA update does not require a peer review. An upgrade could include the following: change in methodology, change in software, or any other change that could be defined as an upgrade.	Procedure EN-DC-151 has been updated to require a peer review for changes in PRA methodology as discussed in the AMSE/ANS PRA Standard.	