PROGRAM SECTION
FOR
ASME SECTION XI, DIVISION 1
ANO 2 INSERVICE INSPECTION PROGRAM

ENTERGY NUCLEAR ENGINEERING PROGRAMS

APPLICABLE SITES

ALL SITES: ☐

Specific Sites:	☐ AN1	☐ IP2	☐ GGN	☐ WF3	☐ PNPS	☐ JAF	☐ VY
	☒ AN2	☐ IP3	☐ HQN	☐ RBS	☐ PLP	☐ RBS	

Safety Related: ☒ Yes ☐ No

REVIEW AND CONCURRENCE SHEET

Program Section Title: ASME SECTION XI, DIVISION 1, ANO 2 INSERVICE INSPECTION PROGRAM

Prepared By: _____ **Date:** _____

Checked By: _____ **Date:** _____

ANII: _____ **Date:** _____

Concurred: _____ **Date:** _____
Responsible Supervisor

REVISION STATUS SHEET

REVISION SUMMARY

REVISION	ISSUE DATE	DESCRIPTION
0		Initial Revision Issued For Use. SEP-ISI-105 replaces CEP-ISI-004.

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1.0 ASME SECTION XI INSERVICE INSPECTION PROGRAM

1.1 Purpose

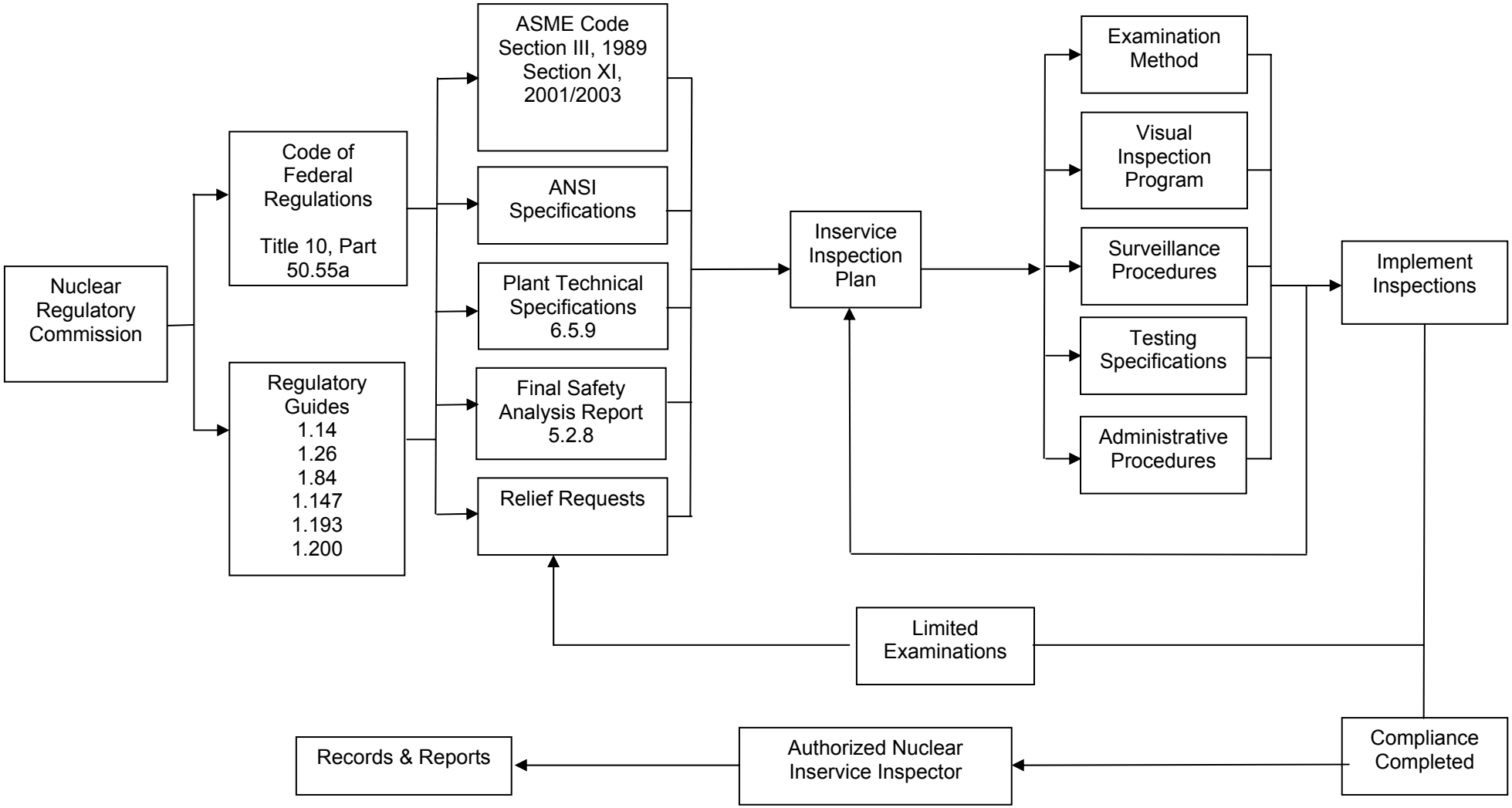
This plan's objective is to provide a traceable link between the governing code requirements and the implementing procedures in order to ensure that Regulatory rules and ASME Section XI Code requirements for the inservice inspection of safety related systems, components and structures are being fulfilled.

These instructions provide the necessary guidance for the Corporate & Station Engineering Programs personnel at Entergy's Arkansas Nuclear One Unit 2 (ANO 2) to ensure the following:

1) Conformance to Title 10, Section 50.55a of the Code of Federal Regulations (10 CFR 50.55a).
2) Conformance to the 2001 Edition through the 2003 Addenda of Section XI of the American Society of Mechanical Engineers (AMSE) Boiler and Pressure Vessel Code.
3) Conformance to Entergy Corporation and Station policies, practices and procedures.
4) The necessary technical content is included in ANO 2 Inservice Inspection Program and implementing procedures.
5) The proper ASME Section XI Code required examinations, tests and administrative procedures are implemented.
6) The proper ASME Code request for alternatives and relief requests are submitted to and approved by the regulatory authority.
7) Component repair and replacement activities are performed in accordance with ASME Section XI Code requirements.
8) The proper examination, test and repair and replacement records and reports are maintained and submitted.

Figure 1 shows how this program plan effectively functions as a central source to help ensure all regulatory rules and Entergy requirements are incorporated into the Inservice Inspection Program. This program plan provides a useful aid in program self assessments, procedure preparation and/or revision, management quick reference, and program familiarization.

Figure 1


Nuclear Regulatory Commission
Code of Federal Regulations
Title 10, Part 50.55a
Regulatory Guides
1.14
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1.84
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1.193
1.200
ASME Code Section III, 1989 Section XI, 2001/2003
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Relief Requests
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1.2 General

The Arkansas Nuclear One Unit 2 (ANO 2) Fourth Interval Inservice Inspection Program is established in accordance with Title 10 Code of Federal Regulations Part 50.55a (10 CFR 50.55a). This program has been developed to comply with the American Society of Mechanical Engineers (ASME) Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components and implements the requirements of Final Safety Analysis Report (FSAR) 5.2.8, Inservice Inspection Program.

ANO 2 received its Construction Permit December 6, 1972. ANO 2 was designed, fabricated and erected in accordance with ASME Section III, 1971 Edition through Winter 1972 Addenda for nuclear piping, and USAS B31.1.0b - 1967 Edition through 1971 Addenda for non-nuclear piping. The Nuclear Steam Supply System (NSSS) was furnished by Combustion Engineering. The Architect Engineer for ANO 2 during construction was Bechtel Corporation. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.26 and 10 CFR 50.2 were used to determine the ASME Code classification for Class 1, 2 and 3 Systems, Structures, and Components.

1.3 Inspection Intervals

The Operating License for ANO 2, Docket No. 50-368 was issued on September 1, 1978. The commercial operation date for ANO 2 was March 26, 1980. The First Ten-Year inspection interval ended March 31, 1990. The Second Ten-Year Inspection Interval concluded on March 26, 2000. The Third Inspection Interval for ANO 2 was completed March 25, 2010. The Fourth Inspection Interval is divided into inspection periods consistent with Table IWB-2412-1. The inspection periods are scheduled as follows:

1st Period: From March 26, 2010 to March 25, 2013	(3 Years)
2nd Period: From March 26, 2013 to March 25, 2017	(4 Years)
3rd Period: From March 26, 2017 to March 25, 2020	(3 Years)

In accordance with ASME Section XI, IWB-2412(b) and IWA-2430, that portion of an inspection interval described as an inspection period may be decreased or extended by as much as 1 year to enable inspections to coincide with a plant refueling outage. However, the adjustments must not cause successive intervals to be altered by more than 1 year. Outages during the fourth inservice inspection interval are scheduled as follows:

ANO Unit 2						
1st Period Refueling Outages		2nd Period Refueling Outages			3rd Period Refueling Outages	
2R21	2R22	2R23	2R24	2R25	2R26	2R27

1.4 ASME Section XI Code of Record for the Fourth Inservice Inspection Interval

The regulations in 10 CFR 50.55a(g)(4) establish the effective ASME Code edition and addenda to be used by licensees for performing inservice inspections of components (including supports). Paragraph 50.55a(g)(4)(ii) requires the use of the latest edition and addenda that has been incorporated by 10 CFR 50.55a(b), one year prior to the beginning of each 120-month ISI interval. This is considered the Code of Record. The Code of Federal Regulation in effect one year prior to the beginning of the fourth interval was CFR73FR52749 published in September 2008. This CFR incorporated, by reference, the ASME Section XI, 2004 Edition in paragraph (b)(2) with limits and conditions and expedited implementation of Code Cases N-729-1 and N-722. In October 2008 CRF73FR57235 was published correcting errors in CFR73FR52749.

Based on the three referenced CFRs in 1.4, the ANO2 Fourth Ten-Year Interval ISI Program Plan is based on the requirements of the 2004 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI. However, Entergy has submitted Request for Alternative ANO2-ISI-0003 requesting to update to the 2001 Edition through the 2003 Addenda to standardize the ISI Program and procedures for the Entergy Southern Fleet plants. Therefore, ANO2 Fourth Ten-Year Interval ISI Program Plan will meet the requirements contained in the 2001 Edition with through the 2003 Addenda with the limits and conditions contained in 10 CFR 50.55a(b)(2) as defined below.

10 CFR 50.55a(b)(2)(xviii)(A), the Level I and II nondestructive examination personnel shall be shall be recertified on a 3 year interval in lieu of the 5 year interval in IWA-2314(a) and IWA-2314(b).

10 CFR 50.55a(b)(2)(xviii)(C), when qualifying visual examination personnel for VT-3 visual examinations under paragraph IWA-2317, the proficiency of training must be demonstrated by administering an initial qualification examination and administering re-examinations on a 3-year interval.

10 CFR 50.55a(b)(2)(xix), the provisions for substitution of alternative examination methods, a combination of methods, or newly developed techniques in the ASME Section XI 1997 Addenda of IWA-2240 must be applied. The provisions in IWA-2240 of the ASME Section XI 2004 Edition are not approved for use.

10 CFR 50.55a(b)(2)(xxi)(A), the provisions of Table IWB-2500-1, Examination Category B-D, Full Penetration Welded Nozzles in Vessels, Items B3.120 and B3.140 in the 1998 Edition of ASME Section XI must be applied. A visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length in Table IWB-3512-1, ASME Section XI, 2004 Edition with a limiting assumption on the flaw aspect ratio (i.e., a/l=0.5) may be performed instead of an ultrasonic examination.

10 CFR 50.55a(b)(2)(xxi)(B), the requirements of Table IWB-2500-1, Examination Category B-G-2, Item B7.80 of the ASME Section XI 1995 Edition is applicable to reused CRD bolting.

10 CFR 50.55a(b)(2)(xxii), the provisions contained in IWA-2220 that allow use the ultrasonic examination method as a surface examination is prohibited.

10 CFR 50.55a(b)(2)(xxiv), the use of Appendix VIII and the supplements to Appendix VIII, and Appendix 1 Article I-3000 of ASME Section XI 2001 Edition will be used. In addition, paragraphs 10 CFR 50.55a(b)(2)(xiv, xv and xvi) are required.

Note: The limitations of 10 CFR 50.55a(b)(2)(xxiv) do not apply when implementing Code Case N-729-1.

ASME Code Cases N-729-1 and N-722 with the applicable limitations and modifications as identified in 10 CFR 50.55a(g)(6)(ii)(D) and (E).

1.5 ASME Section XI Inservice Inspection Program Description

The ASME Section XI Inservice Inspection Program for the Fourth Inspection Interval is comprised of the following individual programs:

- The ASME Section XI and Augmented ISI Program for pressure retaining components and their supports,
- The ASME Section XI System Pressure Test Program,
- The ASME Section XI Containment Inspection Program, and
- The ASME Section XI Repair and Replacement Program

These programs are separate documents or procedures, each bearing the title of the program. The ISI Programs are administered through EN-DC-174, “Engineering Program Sections”.

For the purpose of clarification, the following definitions for terms used in the ASME Section XI Inservice Inspection program are:

PROGRAM The term "*program"* is used to provide the structure and methods for accomplishment of the object and is to be considered synonymous with the term "*plan*" as used in ASME Section XI, 2001 Edition through the 2003 Addenda, Article IWA-2400.

SCHEDULE The term "*schedule*" is used to define the detailed scheme of performing the required inspections over the ten-year interval.

1.5.1 Ten-Year Inservice Inspection (ISI) Program Description

The Ten-Year Inservice Inspection Program details ANO compliance with ASME Code, Section XI 2001, Edition through 2003 Addenda, Articles IWA, IWB, IWC, IWD, and IWF for examination of Class 1, 2, and 3 pressure retaining items and their supports. This document defines the Class 1, 2, and 3, components and the Code required examinations for each ASME Section XI examination category, and the augmented inspection scope.

The purpose of the Ten-Year ISI Program is to periodically perform nondestructive examination of ASME Class 1, 2, or 3 safety related components and supports in order to identify the presence of service related degradation.

The administrative procedures and Inspection Schedule described in the Ten-Year ISI Program, combined with applicable ANO, Entergy, and approved vendor procedures, constitute the ISI portion of the Ten-Year ISI Program required by SAR 5.2.8.

For convenience, the Ten-Year ISI Program also contains augmented examinations that are outside the scope of 10 CFR 50.55a. These examinations may result from activities including, but not limited to, commitments made to the NRC outside the scope of 10 CFR 50.55a, internal commitments, License Renewal commitments, or industry initiatives. These examinations may use ASME Section XI techniques and procedures as defined in the commitment, however, the requirements of ASME Section XI, including reporting, do not apply. These augmented examinations are not required by the ASME Code and are not included in the summary totals for the specific examination category.

The Ten-Year ISI Program schedule is contained in the IDDEAL Software Suite® ScheduleWorks® computer database. This information is retained at the plant site and is available for review.

1.5.2 Repair and Replacement Program Description

ASME Section XI requirements for repairs and replacements are not contained in this plan. OP-5000.009, Repair/Replacement Program Administration is the

implementing procedure which describes the implementation process for the repair and replacement provisions of ASME Code, Section XI, Articles IWA-4000, and IWL-4000.

1.5.3 Snubber Program Description

The Snubber Program requirements are not contained in this plan. The ANO2 Snubber Program satisfies the requirements of ISTD of the OM Code in lieu of IWF-5000 as permitted by 10 CFR 50.55a(b)(3)(v) except that preservice and inservice examinations must be performed using the VT-3 visual examination method described in IWA-2213. Snubber support hardware such as lugs, bolting, pins, clamps, and structural steel between the snubber pin and the pressure retaining item and between the snubber pin and the building steel are included in the support population and examined in accordance with Subsection IWF per this Program Section.

1.5.4 Pressure Test Program Description

ASME Section XI requirements for pressure testing are not contained in this plan. OP-5120.245, Unit 2 – Inservice Inspection (ISI) Period Pressure Test, satisfies the requirements established in ASME, Section XI, Articles IWA-5000, IWB-5000, IWC-5000, and IWD-5000.

1.5.5 Containment Inspection Program Description

ASME Section XI requirements for CC and MC components are not contained in this plan. CEP-CISI-105, ANO-2 Containment Inservice Inspection Program, implements the requirements of the ASME Code, Section XI Articles IWE and IWL (Class MC and CC components).

1.5.6 Pump and Valve Program Description

The Inservice Testing (IST) Program requirements are not contained in this plan. *The ANO2 Inservice Testing Program* implements the requirements of the ASME OM Code.

1.5.7 Steam Generator Tube Surveillance Program Description

In accordance with 10 CFR 50 55(a)(b)(2)(iii), the Steam Generator Tube Inspection Program is in accordance with Technical Specification 6.5.9 in lieu of ASME Section XI. The Steam Generator Program is managed under procedures: OP-5120.500, SG Implementing Procedure, OP-5120.509, SG ISI Implementing Procedure, and OP-5120.518 Testing and Repair.

1.6 Records, Reports, and Submittals

The requirements of Code Case N-532-4 shall be met in lieu of the requirements of IWA-6210(c), (d), (e), and (f), IWA-6220, IWA-6230(b), (c), and (d), IWA-6240(b) and IWA-6350. All other requirements of IWA-6000 and the other requirements of Section XI applicable to records and reporting shall be met as described below.

1.6.1 Records

Records of examinations, tests, and repair replacement activities shall be prepared in accordance with the governing procedure or program document.

Records and reports required by Section XI and this program are safety related and shall be maintained as a permanent plant record. They shall be filed in a manner to ensure accessibility by the Authorized Nuclear Inservice Inspector (ANII). The storage and maintenance of these records are under the auspices of the Quality Assurance Program.

Records and reports shall be either the original or a reproduced legible copy. Alternatively, they may be maintained in an electronic format provided the requirements of IWA-6320(a) are met. Radiographs may be microfilmed or digitally reproduced. Digital reproduction shall be in accordance with IWA-6320(b).

Inservice Inspection Records, as a minimum shall include:

a. Record Index

b. Inservice inspection plans and schedules

c. Inservice examination/inspection reports

d. Records and reports of repair/replacement activities

e. Records of flaw acceptance by analytical evaluation

f. Records of regions in ferritic class 1 components with modified acceptance criteria

g. Nondestructive examination procedures

1.6.2 Reports and Submittals

Reports and submittals comprise those documents or records that are required to be submitted to the NRC either on a recurring basis or as a result of activities described by Section XI. Reports shall be as described below. Reports and submittals are provided to the NRC for **"Information Only"** to meet a specific Section XI requirement. NRC approval is **not** required.

In accordance with IWA-1400(c), the initial ISI Program and its revisions shall be provided to the NRC. Program Change Notices (PCN) are not required to be submitted.

The Summary Reports required by IWA-6000 are replaced by the Owner's Activity Report described by Code Case N-532-4. The Owner's Activity Report shall be prepared to meet the requirements of the Code Case and submitted to the NRC within 90 calendar days of completing each refueling outage. The report shall include all applicable activities of the operating cycle not included in the previous report.

Analytical evaluations that accept items for continued service in accordance with IWB-3132.3, IWB-3142.4, IWC-3122.3, IWC-3132.3, and IWD-3600 shall be submitted to the NRC. If the evaluation is performed during a refueling outage, the submittal may be included with the Owner's Activity Report provided the cover letter makes specific reference to the contained analytical evaluation. Evaluations performed during the operating cycle between refuel outages shall be submitted independent of the Owner's Activity Report. As a guide, these submittals should be timely and within 30 calendar days of completing the analytical evaluation.

Evaluation procedures used in analytical evaluations of flaws in austenitic and ferritic piping shall be provided to the NRC in accordance with IWB-3640, IWC-3640, and IWD-3640. A onetime submittal is acceptable provided subsequent revisions are provided and the scope and application of the procedure does not change. The cover letter should indicate that the procedure is only submitted once (not for each use) and what criteria will be used to determine when additional submittals will be made.

When acceptance standards have been modified as a result of using smaller flaw sizes in developing the Pressure/Temperature Limit Curves in accordance with IWB-3410.2, the modified acceptance standards shall be filed with the NRC.

1.7 Administrative Controls

This program is written and implemented as a Program Section meeting the requirements of EN-DC-174, “Program Sections”. This Program Section will be maintained through revisions and Program Change Notices in accordance with EN-DC-174.

This program will be maintained current to reflect applicable changes to plant configuration through the review process defined by EN-DC-115, Engineering Change Process”.

Additions of items to the program resulting from changes to the plant configuration will be incorporated and scheduled for inspection or examination in accordance with IWB/IWC/IWD/IWE-2412 and IWF-2410.

Organizational and divisions of responsibilities for the management and implementation of the ISI Program are defined in EN-DC-120, “Engineering Code Programs”.

Several elements required by Section XI to be contained in the ISI Program are maintained in the Iddeal Concepts Software Suite®. This software and its contents are part of the formal ISI program and are controlled in accordance with Program Section CEP-COS-0100, “Control and Use of Iddeal Concepts Software”.

The initial ISI Program Plan, revisions, and PCNs are subject to review by the Authorized Nuclear Inservice Inspector (ANII).

2.0 ASME CODE CASE APPLICABILITY

This section contains ASME Code Cases applicable to the ANO 2 Fourth Inspection Interval.

2.1 Adoption of Code Cases

ASME Section XI Code Cases adopted for ISI and related NDE activities for the Fourth Interval are listed in Tables 2.2-1, 2.3-1, and 2.4-1. The use of Code Cases is in accordance with ASME Section XI, IWA-2440, 10 CFR 50.55a, and Regulatory Guide 1.147. As permitted by ASME Section XI and Regulatory Guide 1.147 or 10 CFR 50.55a, ASME Section XI Code Cases may be adopted and used as described below:

2.1.1 Adoption of Code Cases Listed for Generic Use in Regulatory Guide 1.147

Code Cases that are listed for generic use in the latest revision of Regulatory Guide 1.147 may be included in the ISI program provided any additional provisions specified in the Regulatory Guide are also incorporated. Table 2.2-1 identifies the Code Cases approved for generic use and adopted for the fourth interval.

2.1.2 Adoption of Code Cases Not Approved in Regulatory Guide 1.147

Certain Code Cases that have been approved by the ASME Board of Nuclear Codes and Standards may not have been reviewed and approved by the NRC Staff for generic use and listed in Regulatory Guide 1.147. Use of such Code Cases may be requested in the form of a “Request for Alternative” in accordance with 10 CFR 50.55a(a)(3). Once approved, these Requests for Alternatives will be available for use until such time that the Code Cases are adopted into Regulatory Guide 1.147, at which time compliance with the provisions contained in the Regulatory Guide is required.

Table 2.3-1 identifies those Code Cases that have been requested through Requests for Alternatives. For convenience to the user of this ISI Program, the appropriate internal correspondence number is provided to assist in their retrieval from Document Control. All other Requests for Alternatives and Relief Requests (those not associated with NRC approval of Code Cases) are addressed in Section 3.

2.1.3 Adoption of Code Cases Mandated by 10 CFR 50.55a

Code Cases required by rule in 10 CFR 50.55a are incorporated into the ISI Program and implemented at the specified schedule. Code Cases currently required by 10 CFR 50.55a are identified in Table 2.4-1.

2.1.4 Use of Annulled Code Cases

As permitted by Regulatory Guide 1.147, Code Cases that have been adopted for use in the current interval that are subsequently annulled by ASME, may be used for the remainder of the interval.

2.1.5 Code Case Revisions

Initial adoption of a Code Case requires use of the latest revision of that Code Case listed in Regulatory Guide 1.147. However, if an adopted Code Case is later revised and approved by the NRC, then either the earlier or later revision may be used. An exception to this provision would be the inclusion of a limitation or condition on the later revision necessary to enhance safety. In this situation, the limitation imposed on the later revision must be incorporated into the program.

2.1.6 Adoption of Code Cases Issued Subsequent to Filing the Inservice Inspection Plan

Code Cases issued by ASME subsequent to filing the Inservice Inspection Plan with the NRC may be incorporated within the provisions of paragraphs 2.1.1 or 2.1.2 by revision to this ISI Plan. Any subsequent Code Cases shall be incorporated into the program and identified in either Table 2.2-1 or 2.3-1, as applicable, prior to their use.

2.1.7 Non Inservice Inspection Code Cases

Only Code Cases applicable to ISI and related nondestructive examination requirements for Class 1, 2, and 3 components and component supports are included in Table 2.2-1 and 2.3-1. Code Cases applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in their respective programs.

2.1.8 Code Cases not approved for use by the NRC

Certain Code Cases that have been approved by the ASME Board of Nuclear Codes and Standards have been reviewed and are not approved by the NRC Staff for generic use. These Code Cases are listed in Regulatory Guide 1.193, ASME Code Cases Not Approved for Use. However, the NRC may approve their use in specific cases. Code Cases listed in the Regulatory Guide will not be used at ANO 2 without an approved Request for Alternative in accordance with 10 CFR 50.55a(a)(3).

2.2 Regulatory Guide 1.147, Revision 15 Approved Code Cases

Table 2.2-1 - Code Cases Adopted from Regulatory Guide 1.147		
Code Case Number	Title	NRC Limitations
N-460	Alternative Examination Coverage for Class 1 and 2 Welds	None
N-526	Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels	None
N-532-4	Repair/Replacement Activity Documentation Requirements and Inservice Summary Report Preparation and Submission	None
N-545	Alternative Requirements for Conduct of Performance Demonstration Detection Test of Reactor Vessel	None
N-552	Alternative Methods - Qualification for Nozzle Inside Radius Section from the Outside Surface	To achieve consistency with the 10 CFR 50.55a rule change published September 22, 1999 (64 FR 51370), incorporating Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," to Section XI, add the following to the specimen requirements: "At least 50 percent of the flaws in the demonstration test set must be cracks and the maximum misorientation must be demonstrated with cracks. Flaws in nozzles with bore diameters equal to or less than 4 inches may be notches." Add to detection criteria, "The number of false calls must not exceed three."

Table 2.2-1 - Code Cases Adopted from Regulatory Guide 1.147		
Code Case Number	Title	NRC Limitations
N-586-1	Alternative Additional Examination Requirements for Classes 1, 2, and 3 Piping, Components, and Supports	None
N-593	Alternative Examination Requirements for Steam Generator Nozzle to Vessel Welds	Essentially 100 percent (not less than 90%) of the examination volume A-B-C-D-E-F-G-H must be inspected.
N-613-1	Ultrasonic Examination of Penetration Nozzles in Vessels, Examination Category B-D, Item Nos. B3.10 and B3.90, Reactor Nozzle-to-Vessel Welds, Figs. IWB-2500-7(a), (b), and (c)	None
N-624	Successive Inspections	None
N-639	Alternative Calibration Block Material	Chemical ranges of the calibration block may vary from the materials specification if (1) it is within the chemical range of the component specification to be inspected, and (2) the phase and grain shape are maintained in the same ranges produced by the thermal process required by the material specification.

Table 2.2-1 - Code Cases Adopted from Regulatory Guide 1.147		
Code Case Number	Title	NRC Limitations
N-648-1	Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles	In place of an UT examination, licensees may perform a visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria of Table IWB-3512-1 with limiting assumptions on the flaw aspect ratio. The provisions of Table IWB-2500-1, Examination Category B-D, continue to apply except that, in place of examination volumes, the surfaces to be examined are the external surfaces shown in the figures applicable to this table (the external surface is from point M to point N in the figure).
N-664	Performance Demonstration Requirements for Examination of Unclad Reactor Pressure Vessel Welds, Excluding Flange Welds	None
N-685	Lighting Requirements for Surface Examination	None
N-695	Qualification Requirements for Dissimilar Metal Piping Welds	None
N-696	Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface	None
N-700	Alternative Rules for Selection of Classes 1, 2, and 3 Vessel Welded Attachments for Examination	None

2.3 Code Cases Approved Through Request for Alternatives

The following ASME Code Cases are not contained in Regulatory Guide 1.147, Revision 15 and require a request for alternative prior to implementation. See Section 3.0 of this plan for the applicable requests.

Table 2.3-1 - Code Cases Adopted Via NRC Approved Requests		
Code Case Number	Title	Request for Alternative No.
N-716	Alternative Piping Classification and Examination Requirements	ANO2-ISI-006

2.4 Code Cases Required by 10 CFR 50.55a

The following ASME Code Cases are not contained in Regulatory Guide 1.147, Revision 15, but are mandated in 10 CFR 50.55a.

Table 2.4-1 - Code Cases Required by 10 CFR 50.55a		
Code Case Number	Title	Notes
N-722	Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials	Conditions specified in paragraphs (g)(6)(ii)(E)(*2*) through (*4*) of 10 CFR 50.55a
N-729-1	Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds	Conditions specified in paragraphs (g)(6)(ii)(D)(*2*) through (*6*) of 10 CFR 50.55a

3.0 RELIEF REQUESTS

Throughout this program, the term “relief request” is used interchangeably referring to submittals to the NRC requesting permission to deviate from either an ASME Section XI requirement, a 10 CFR 50.55a rule, or to use provisions from Editions or Addenda of Section XI not approved by the NRC as referenced in 10 CFR 50.55a(b). However, when communicating with the NRC and in written requests to deviate, the terms as defined below must be used for clarity and to satisfy 10 CFR 50.55a. Submittals to the NRC must clearly identify which of the below rules are being used to request the deviation.

Table 3.0-1 contains an index of Relief Requests written in accordance with 10 CFR 50.55a(a)(3) and (g)(5). The applicable Entergy submittal and NRC Safety Evaluation Report (SER) correspondence numbers are also included for each request.

Only requests associated with the ISI program and the supporting nondestructive examination requirements are listed in Table 3.0-1. Requests applicable to System Pressure Testing and Repair/Replacement Activities are identified in their respective program documents.

3.1 Request for Alternatives

When seeking an alternative to the rules contained in 10 CFR 50.55a(c), (d), (e), (f), (g), or (h) the request is submitted under the provision of 10 CFR 50.55a(3). Once approved by the Director, Office of Nuclear Reactor Regulation, the alternative may be incorporated into the ISI program. These types of requests are typically used to request use of Code Cases, Code Edition, or Addenda not yet approved by the NRC. Request for Alternatives must be approved by the NRC prior to their implementation or use. Within the provisions of 10 CFR 50.55a(3) there are two specific methods of submittal:

3.1.1 10 CFR 50.55a(a)(3)(i) allows alternatives when authorized by the NRC, if the proposed alternatives would provide an acceptable level of quality and safety. Requests submitted under these provisions are not required to demonstrate hardship or burden.

3.1.2 10 CFR 50.55a(a)(3)(ii) also allows alternatives when authorized by the NRC, if compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. When submitted under this provision, there must be evidence of unusual hardship or difficulty. Typically this hardship will be dose or excessive disassembly.

3.2 Relief Request Required due to Impracticality or Limited Examinations

10 CFR 50.55(a)(g)(5)(iii) and (iv) allows relief to be requested in instances when a Code requirement is deemed impractical with (iv) being specific to examination requirements that are determined to be impractical. The provisions of these two paragraphs are typically used to address impracticalities like limited examination coverage. Under 10 CFR 50.55(a)(g)(5)(iv), relief requests for examination impracticalities must be provided to the NRC no later than 12 months after the end of the active 120-month interval

In cases where the ASME Section XI requirements for inservice inspection are considered impractical, Entergy will notify the NRC and submit information to support the determination, as required by 10 CFR 50.55a(g)(5). The submittal of this information will be referred to as a Request for Relief.

In the event that the entire examination volume or surface (as defined in the ASME Code) cannot be examined due to interference by another component or part geometry, then in accordance with Code Case N-460, a reduction in examination volume or area is acceptable if the reduction is less than 10%. In the event that the reduction in examination volume or area is 10% or greater, a request for relief will be submitted. NRC Information Notice 98-42 provides additional guidance that all ASME Section XI examinations should meet the examination coverage criteria established in Code Case N-460. Therefore, the guidance included in NRC Information Notice 98-42 will be followed by Entergy when determining whether to prepare a relief request or apply the criteria of Code Case N-460 for examinations where less than 100% coverage of any Section XI examination is obtained. This does not apply to the bare metal visual examination required by Code Case N-729-1. When performing visual examinations to meet N-729-1, the requirements of N-729-1 shall be used for determining allowance for partial examination of the required surface.

3.3 Requests to use Later Edition and Addenda of ASME Section XI

On July 28, 2004, the NRC published Regulatory Issue Summary (RIS) 2004-12, “Clarification on Use of Later Editions and Addenda to ASME OM Code and Section XI”.

This RIS clarifies the NRC position on using Editions and Addenda of Section XI, in whole or in part, later than those specified in the ISI program. If the desired Edition or Addenda are referenced in 10 CFR 50.55a(b)(2), the request is submitted following the guidance of the RIS. These types of request are not required to demonstrate hardship, difficulty, or provide evidence of quality and safety. They do need to ensure that all related requirements are also used. Requests to use edition and/or addenda of ASME Section XI that are referenced in 10 CFR 50.55a(b)(2) that are later than the initial Code of Record established for the ISI program shall be submitted under the provisions of 10 CFR 50.55a(g)(4)(iv).

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Table 3.0-1 Arkansas Nuclear One Unit 2 Fourth Interval Relief Requests			
Relief Request	Relief Request Description	Entergy Correspondence	NRC Ser Correspondence
ANO2-ISI-0003	Request to Use the 2001 Edition through the 2003 Addenda	2CAN060902	2CNA041001
ANO2-ISI-004	Proposed Alternative to Extend the Third 10-Year Inservice Inspection Interval for Reactor Vessel Weld Examinations	2CAN100902	2CNA091002
ANO2-ISI-005	Request to Extend the Inservice Inspection Interval for the Visual Examination of Accessible Interior to Reactor Vessel Attachment Weld	2CAN110905	2CNA091003
ANO2-ISI-006	Request to Use Code Case N-716, Alternative Piping Classification and Examination Requirements	2CAN011005	2CNA011101
ANO2-R&R-005	Request for Alternative to ASME Code Requirements for Weld Overlay Repairs	2CAN020801	2CNA030805

4.0 Developmental References

4.0.1 Title 10, Code of Federal Regulations, Part 50.

4.0.2 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 2001 Edition through the 2003 Addenda.

4.0.3 Regulatory Guide 1.14, Reactor Coolant Pump Flywheel Integrity.

4.0.4 Regulatory Guide 1.147, Code Case Applicability.

4.0.5 Regulatory Guide 1.26, Quality Group Classifications.

4.0.6 Arkansas Nuclear One Unit 2 Technical Specifications

4.0.7 CEP-NDE-0214, Inservice Inspection Implementation

4.0.8 CEP-COS-100, Control and Use of Iddeal Concepts Software

4.0.9 CEP-COS-110, Control and Use of the of ScheduleWorks® Module of IDDEAL Software

4.0.10 EN-DC-174, Engineering Program Sections

4.0.11 EN-DC-120, Entergy Code Programs

5.0 Augmented Inservice Inspection Requirements

The Ten-Year ISI Program also contains augmented examinations that are outside the scope of 10 CFR 50.55a. These examinations may result from activities including, but not limited to, commitments made to the NRC outside the scope of 10 CFR 50.55a, internal commitments, License Renewal commitments, or industry initiatives. These examinations may use ASME Section XI techniques and procedures as defined in the commitment, however, the requirements of ASME Section XI, including reporting, do not apply. These examinations are not required by the ASME Code and are not included in the summary totals for the specific examination category. Changes to these examination requirements and schedules are outside of 10 CFR 50.55a and are required to be evaluated using the 10 CFR 50.59 screening/review process.

5.1 Augmented Examination Programs

Augmented Examination Programs are those that have been developed to address NRC or industry concerns in which ANO has committed to perform. The augmented examinations addressed by the ANO 2 ISI Program during the fourth inspection interval are as follows:

5.1.1 **RG 1.14 RCP FLYWHEEL**: Reactor Coolant Pump Flywheel Integrity

Source Document: NRC Commitment 17503, NRC Regulatory Guide 1.14, Revision 1
Associated Document: Technical Specification 6.5.7

Purpose: The reactor coolant pump (RCP) motor flywheels are examined due to a concern about high-energy missiles inside containment that could potentially damage, and cause the simultaneous failure of, multiple trains of redundant safety-related systems.

Scope: The scope includes the examination of all four RCP flywheels.

Method: Surface and volumetric examinations of all four RCP flywheels shall be conducted in accordance with ANO Technical Specification 6.5.7. These examinations are to be performed to the extent possible through the access ports in the motor housings without disassembly of the motors.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through the 2003 Addenda

Frequency: All areas of high stress concentration (i.e., keyway and bore) in all 4 RCP flywheels shall be volumetrically examined once every 10-Year ISI Interval.

Acceptance Criteria or Standard: Any flaws detected during examination shall be forwarded to Design Engineering for resolution.

Regulatory Basis: The regulatory basis for this augmented examination program is NRC Regulatory Guide 1.14, Revision 1.

5.1.2 **MRP-139**: Primary System Piping Butt Weld Inspection and Evaluation Guideline

Source Document: Materials Reliability Project MRP-139

Associated Document: NEI 03-08 letter

Purpose: Components in the primary coolant system containing Alloy 600 material and 82/182 dissimilar metal butt welds may be susceptible to degradation cause by primary water stress corrosion cracking (PWSCC). MRP-139 is the industry standard for examination of primary system components which may be susceptible to PWSCC corrosion.

Scope: The scope includes those primary coolant system components containing Alloy 600 material and 82/182 dissimilar metal butt welds.

Method: Surface and volumetric examination methods are required and are based on the component material, its operating temperature, stress reduction methods utilized, (if applicable) and the component repair history and are assigned by Tables 6.1 and 6.2 of MRP-139.

Industry Code or Standards: Materials Reliability Project MRP-139.

Frequency: Examination frequencies are based on the component material, its operating temperature, stress reduction methods utilized, (if applicable) and the component repair history and are assigned by Tables 6.1 and 6.2 of MRP-139.

Acceptance Criteria or Standard: ASME Section XI, IWB-3500.

Regulatory Basis: Nuclear Energy Institute (NEI) 03-08 Initiative.

Note: The visual examinations recommended by MRP-139 are replaced with the visual examinations contained in Code Case N-722 required by 10 CFR 50.55a.

5.1.3 **MRP-192**: RHR Mixing Tee Thermal Fatigue

Source Document: Materials Reliability Project MRP-192

Associated Document: NEI 03-08 letter

Purpose: In 1998, a leak occurred in the Civaux 1 reactor residual heat removal system (RHRS). The leak was from the extrados of an elbow immediately downstream of where the bypass line and the main flow line of one of the parallel RHR heat exchangers joined together due to thermal fatigue. There were many other part-wall cracks in other regions of the piping immediately downstream of the mixing tee.

An assessment performed on a group of US Plants indicated that all U.S. PWR reactor residual heat removal systems are designed to allow bypass around the system heat exchanger to control the temperature of the flow back to the reactor. Thus, mixing of hot and cold fluids can occur at the mixing tee downstream of the heat exchanger. This guideline is provided as good practice under the Nuclear Energy Institute (NEI) 03-08 implementation protocol.

Scope: A system evaluation was conducted to determine where mixing conditions will occur or have occurred during plant heatup and cooldown operations. Results of the ANO2 evaluation recommended that welds 55-041, 55-042, and 55-053 need inspection.

Method: Volumetric examination methods are required and require the examiner to complete Computer Based NDE Training for Thermal Fatigue Cracking MRP-36.

Industry Code or Standards: Materials Reliability Project MRP-192.

Frequency: Every 10 Years.

Acceptance Criteria or Standard: ASME Section XI, IWC-3500.

Regulatory Basis: Nuclear Energy Institute (NEI) 03-08 Initiative.

5.1.4 **NUREG-0612 HEAVY LOADS**: Control of Heavy Loads at Nuclear Power Plants

Source Document: NUREG-0612

Commitment No.: P-9234

Associated Documents: Procedure 1402.091, NRC Generic Letter 85-11

Purpose: The purpose of this augmented examination is to perform surface examinations of critical welds on special lifting devices in accordance with NUREG-0612. Visual examinations of the components shall be performed per Maintenance procedure OP-1402.091 and are not included in the ANO2 ISI program.

Scope: As defined in Procedure 1402.091, Attachment 1, the special lifting devices addressed by this augmented examination are the Tripod, Upper Guide Structure Lift Rig, Reactor Head Maintenance Structure Lift Beam, and Core Support Barrel Lift Rig. These augmented examinations do not address the fuel handling crane or polar crane, which are addressed by separate Maintenance Department programs independent of the ISI Program.

Method: Critical welds on the subject components shall be subject to a surface examination.

Industry Code or Standards: ANSI N14.6-1978 and ANSI B30.9-1971 were used to develop this program.

Frequency: The surface examination shall be performed once every ten years.

Acceptance Criteria or Standard: Acceptance criteria are stated in N14.6-1978, Section 5.5.

Regulatory Basis: The regulatory basis for this augmented examination program is NRC NUREG-0612.

5.1.5 Dry Spent Fuel Storage Casks: Dry Spent Fuel Storage Casks Integrity

Source Document: 10 CFR Part 72

Commitment No.: P-16458

Associated Document: 1CNA049906, Sections 1.3.2 and 1.3.3 of the storage cask's "Certificate of Compliance"

Purpose: Visual inspections shall be performed on dry spent fuel storage casks in accordance with Sections 1.3.2 and 1.3.3 of the storage cask's "Certificate of Compliance" which was issued in accordance with 10 CFR Part 72. These dry storage casks perform the same function as the Spent Fuel Storage Pool, which is a Class 3 system.

Scope: Dry Spent Fuel Storage Casks.

Method: Visual Inspection.

Industry Code or Standards: None.

Frequency: An external visual examination of all loaded casks shall be performed once per year. In addition, a visual inspection of the internal space of the first-loaded cask shall be performed once every 5 years beginning from the date it was loaded.

Acceptance Criteria or Standard: Sections 1.3.2 and 1.3.3 of the storage cask's "Certificate of Compliance"

Regulatory Basis: 10 CFR Part 72.

5.2 OWNER ELECTED EXAMINATIONS FOR INTERNAL COMMITMENTS

There are no Owner Elected examination commitments for ANO 2 at this time in the ISI Plan.

5.3 LICENSE RENEWAL EXAMINATIONS FOR AGING MANAGEMENT COMMITMENTS

ANO License Renewal Application credits the ISI Program for aging management in the following sections: Reactor Vessel Internals, Reactor Coolant System, Reactor Pressure Vessel and Component Supports.

6.0 ASME SYSTEMS & EXAMINATION BOUNDARIES

6.1 This section defines those systems that are designated as ASME Class 1, 2, or 3 and provides justification for their inclusion or exclusion within the Fourth Ten-Year Inspection Interval NDE Program. Several of ANO Unit 2 systems or portions of systems are excluded from system and component NDE as allowed by Articles IWB-1200, IWC-1200, and IWD-1200. However, these portions of systems are not excluded from the pressure testing requirements of ASME Code, Section XI, except as allowed by Articles IWA-5000, IWB-5000, IWC-5000, and IWD-5000. System information for the NDE Program is provided in Table 6.1, ANO 2 ASME Code Class Systems. The 2001 Edition through the 2003 Addenda of the ASME Code, Section XI defines the inspection requirements for each of the ASME Code Classes within the fourth inspection interval, which began on March 26, 2010.

6.2 Per IWA-1400(a) of the 2001 Edition through the 2003 Addenda of Section XI, it is the owner's responsibility to determine the appropriate Code Classes for each component and to identify the system boundaries subject to inspection. IWA-1400(a), footnote 1, states that classification criteria are specified in 10 CFR 50. This reference is to footnote 9 of 10 CFR 50.55a which references Regulatory Guide 1.26 and Section 3.2.2 of NUREG-0800.

6.3 The component classifications of the ASME Code (Class 1, 2, or 3) determine the rules and requirements for inspection and define the Section XI examination boundaries. Because early vintage nuclear plants were designed and constructed before Section III of the ASME Boiler and Pressure Vessel Code was incorporated into 10 CFR 50.55a, the ASME Section XI Code classifications for ISI may differ from the original design classifications. Therefore, while the ASME Code classifications determine the rules for repairs and replacements and the component inspection requirements, repairs and replacements are generally performed to meet the specifications of the original design code.

6.4 The 2008 Code of Federal Regulations provides criteria for the classification of Quality Group A components. In previous issues of 10 CFR, this criterion was provided in section 50.2(v). Regulatory Guide 1.26, Quality Group Classifications and Standards for Water, Steam, and Radioactive Waste Containing Components of Nuclear Power Plants, provides criteria for the classification of Quality Group B, C, and D components. Regulatory Guide 1.26 was used for ASME Code, Section XI component classification at ANO 2.

6.5 The ASME Code Class 1, 2, and 3 systems required to be examined in accordance with ASME Code, Section XI, 2001 Edition through the 2003 Addenda, are identified on boundary drawings. These are Plant Controlled drawings.

TABLE 6.1
ARKANSAS NUCLEAR ONE UNIT 2
ASME CODE CLASS SYSTEMS

SYSTEM (SYSTEM DESIGNATOR)	Boundary Drawing (P Drawing) #	ASME CODE CLASS	INSPECTION REQUIREMENTS
Emergency Feedwater Storage	P-204, Sheet 4	3	IWD-2000 IWD-5000
Lube Oil, Lube Oil Cooling, EHC & Main Steam	P-2202, Sheet 4	3	IWD-2000, 5000
Emergency Feedwater	P-2202, Sheet 4	2, 3	IWC-2000, 5000 IWD-2000, 5000
Steam Generator Secondary System	P-2206, Sheet 1	2, 3	IWC-2000, 5000 IWD-2000, 5000
Steam Generator Secondary System	P-2206, Sheet 2	2	IWC-2000, 5000 NDE Exempt - IWC-1222(a)(1)
Service Water System	P-2210, Sheet 1	3	IWD-2000, 5000
Service Water System	P-2210, Sheet 2	3	IWD-2000, 5000
Service Water System	P-2210, Sheet 3	3	IWD-2000, 5000
Liquid Radioactive Waste System	P-2213, Sheet 1	2	NDE Exempt - IWC-1221(a)(1) SPT Exempt – IWC-5222(b)
Liquid Radioactive Waste System	P-2213, Sheet 2	2	NDE/SPT Exempt IWA-1320(e)

TABLE 6.1
ARKANSAS NUCLEAR ONE UNIT 2
ASME CODE CLASS SYSTEMS

SYSTEM (SYSTEM DESIGNATOR)	Boundary Drawing (P Drawing) #	ASME CODE CLASS	INSPECTION REQUIREMENTS
Liquid Radioactive Waste System – Reactor Bldg	P-2213, Sheet 8	3	NDE/SPT Exempt - IWD-1210
Boron Management System	P-2214, Sheet 1	3	NDE/SPT Exempt - IWD-1210
Gaseous Radioactive Waste	P-2215, Sheet 1	2, 3	NDE Exempt - IWC-1222(a) SPT Exempt – IWC-5222(b) NDE/SPT Exempt IWD-1210
Emergency Diesel Generator Auxiliary Systems	P-2217, Sheet 3	3	IWD-2000, 5000
Service Air System	P-2218, Sheet 1	2	NDE Exempt - IWC-1222(a)(1) SPT Exempt - IWA-5110(c)
Instrument Air System	P-2218, Sheet 2	2	NDE Exempt - IWC-1222(a) SPT Exempt - IWA-5110(c)
Instrument Air System	P-2218, Sheet 3	2	NDE Exempt - IWC-1222(c) SPT Exempt - IWA-5110(c)
Breathing Air System	P-2218, Sheet 5	2	NDE Exempt - IWC-1222(a) SPT Exempt - IWA-5110(c)
Instrument Air System	P-2218, Sheet 6	2	NDE Exempt - IWC-1222(c) SPT Exempt - IWA-5110(c)
Fire Water	P-2219, Sheet 2	2	NDE Exempt - IWC-1222(a) SPT Exempt - IWA-5110(c)
Plant Heating System	P-2220, Sheet 1	2	NDE Exempt - IWC-1222(a) SPT Exempt - IWA-5110(c)

TABLE 6.1
ARKANSAS NUCLEAR ONE UNIT 2
ASME CODE CLASS SYSTEMS

SYSTEM (SYSTEM DESIGNATOR)	Boundary Drawing (P Drawing) #	ASME CODE CLASS	INSPECTION REQUIREMENTS
Chilled Water System – Containment, Turbine & Auxiliary Bldg	P-2222, Sheet 1	2	NDE Exempt - IWC-1222(c) SPT Exempt - IWA-5110(c)
Reactor Coolant System	P-2230, Sheet 1	1	IWB-2000, 5000 IWC-2000, 5000
Reactor Coolant System	P-2230, Sheet 2	1, 2, 3	IWB-2000, 5000 IWC-2000, 5000 IWD-2000, 5000
Chemical & Volume Control System	P-2231, Sheet 1	1, 2, 3	IWB-2000, 5000 IWC-2000, 5000 IWD-2000, 5000
Chemical & Volume Control System	P-2231, Sheet 2	2, 3	NDE Exempt – IWC-1222(d) SPT Exempt – IWC-5222(b) NDE / SPT Exempt – IWA-1320(e)
Safety Injection System	P-2232, Sheet 1	1, 2, 3	IWB-2000, 5000 IWC-2000, 5000 IWD-2000, 5000
Component Cooling System	P-2234, Sheet 1	2	NDE Exempt - IWC-1222(c) SPT Exempt – IWA-5110(c)
Fuel Pool Cooling System	P-2235, Sheet 1	2, 3	IWC- 5000 NDE Exempt - IWC-1222(c) IWD-2000, 5000
Containment Spray System	P-2236, Sheet 1	2	IWC-2000, 5000
Containment Spray System	P-2236, Sheet 2	2	NDE / SPT Exempt - IWA-1320(e)

TABLE 6.1
ARKANSAS NUCLEAR ONE UNIT 2
ASME CODE CLASS SYSTEMS

SYSTEM (SYSTEM DESIGNATOR)	Boundary Drawing (P Drawing) #	ASME CODE CLASS	INSPECTION REQUIREMENTS
Sampling System	P-2237 Sheet 1	2	NDE Exempt - IWC-1222(a) IWC-5000
Reactor Coolant Pump Connections	P-2238 Sheet 1	2, 3	NDE Exempt - IWC-1222(a) IWC-5000 NDE/SPT Exempt - IWD-1210
Nitrogen Addition System	P-2239 Sheet 1	2	NDE Exempt - IWC-1222(c) SPT Exempt – IWA-5110(c)
Air Flow & Control For HVAC – Containment Building	P-2261 Sheet 1	2, 3	IWC-2000, 5000 IWD-1320(e)
Air Flow & Control For HVAC – Containment Building	P-2261 Sheet 2	3	IWD-1320(e)
Air Flow & Control For HVAC – Post Accident Hydrogen Analysis System	P-2261 Sheet 3	2, 3	IWD-1320(e)
Air Flow & Control For HVAC – Containment Building	P-2261 Sheet 4	3	IWD-1320(e)
Air Flow & Control For HVAC – Auxiliary Building Radwaste Area	P-2262 Sheet 2	3	IWD-1320(e)
Air Flow Diagram Containment Penetration Room Ventilation System	P-2264 Sheet 1	3	IWD-1320(e)

7.0 APPLICATION CRITERIA AND CODE COMPLIANCE

7.1 ASME Section XI

The following provides a summary of the application of ASME Code, Section XI, 2001 Edition through the 2003 Addenda to the Arkansas Nuclear One Nuclear Plant, Unit 2, Ten-Year Program for the Fourth Inspection Interval. The application and distribution of examinations for this interval is based upon utilizing Inspection Program B as defined by Articles IWB-2412, IWC-2412, and IWD-2412 of Section XI. Section 7.1 and Table 7.1 is provided as a snapshot at the beginning of the interval and is to be used as For Information Only. The controlled information is contained in the Iddeal ScheduleWorks Database.

The results of this application are summarized by ASME Category and Item number and are contained within Table 7.1. **These tables only contain those ASME Item numbers that are relevant to ANO 2.**

7.1.1 EXAMINATION CATEGORY B-A - PRESSURE RETAINING WELDS IN REACTOR VESSEL

Reactor vessel examinations were scheduled on the reactor pressure vessels to meet the 2001 Edition through the 2003 Addenda of the ASME Code, Section XI as required by 10 CFR 50.55a. Article IWB-2420 in the 2001 Edition through the 2003 Addenda of ASME Code, Section XI requires that the sequence of component examinations be repeated during each successive inspection interval, to the extent practical. Request for Alternative ANO2-ISI-004 was submitted in the third interval to extend the inspection interval to 20 years for all reactor vessel welds. The welds were last examined in the spring of 1999 and are scheduled in 2018.

This meets the Examination Category B-A examination requirements in the 2001 Edition through the 2003 Addenda of Section XI as modified by Request for Alternative ANO2-ISI-004.

7.1.2 EXAMINATION CATEGORY B-B - PRESSURE RETAINING WELDS IN VESSELS OTHER THAN REACTOR VESSELS

The 2001 Edition through the 2003 Addenda of the ASME Code Section XI, Examination Category B-B requires that pressurizer and primary side of steam generators be examined during the inspection interval. The examinations may be limited to one of a group of vessels with similar function.

STEAM GENERATORS

There is one Class 1 Examination Category B-B, weld on both steam generators. Table IWB-2500-1, Category B-B, Note (1) allows the examination be limited to one vessel among a group of vessels performing a similar function or 50%. There is one tube sheet to head weld on each S/G. One of two tube sheet to head welds is selected for examination, thus meeting the one vessel among a group of vessels performing a similar function or 50% requirement.

PRESSURIZER

Section XI requires examination of both shell to head welds and one foot of one intersecting longitudinal weld per head. The ANO2 pressurizer does not contain any longitudinal welds. Both of the shell to head welds are selected meeting the 100% requirement.

This meets the Examination Category B-B examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.3 EXAMINATION CATEGORY B-D - FULL PENETRATION WELDS OF NOZZLES IN VESSELS

This category applies to the reactor vessel, pressurizer, and steam generators. ASME Code, Section XI does not allow the deferral of these examinations, except for nozzle to reactor vessel welds. Table IWB-2500-1, Category B-D, Note 3, allows partial deferral if the examinations are conducted from inside the component and the nozzle weld is examined by straight beam UT from the nozzle bore, the examinations required to be conducted from the shell inside diameter may be performed at or near the end of the interval. Request for Alternative ANO2-ISI-004 was submitted in the third interval to extend the inspection interval to 20 years for all reactor vessel welds. The welds were last examined in the spring of 1999 and are scheduled in 2018.

10 CFR 50.55a(b)(2)(xxi)(A) requires that the provisions of Table IWB–2500–1, Examination Category B–D, Full Penetration Welded Nozzles in Vessels, Code Items B3.120 and B3.140 in the 1998 Edition must be applied when using the 2001 Edition through the 2003 Addenda. A visual examination with magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria in Table IWB–3512–1 with a limiting assumption on the flaw aspect ratio (i.e., a/l=0.5), may be performed instead of an ultrasonic examination. All of the pressurizer and steam generator nozzle to vessel welds and nozzle inner radii are selected for examination meeting the 100% examination requirement.

This meets the Examination Category B-D examination requirements in the 2001 Edition through the 2003 Addenda of Section XI as modified by Request for Alternative ANO2-ISI-004 and 10 CFR 50.55a(b)(2)(xxi)(A).

7.1.4 EXAMINATION CATEGORY B-F - PRESSURE RETAINING DISSIMILAR METAL WELDS IN VESSEL NOZZLES

This category addresses Nozzle-to-Safe End Welds and Piping Welds. ANO 2 has developed a Code Case N-716 RI-ISI program. All Examination Category B-F Welds have been re-categorized as R-A welds in accordance with Code Case N-716. Code Case N-716 has been submitted to the NRC via Request for Alternative ANO2-ISI-006. Therefore no examinations will be performed per Examination Category B-F.

7.1.5 EXAMINATION CATEGORY B-G-1 - PRESSURE RETAINING BOLTING, GREATER THAN 2" IN DIAMETER

The examination of the Reactor Vessel Bolting will be deferred to the end of the interval and performed in the third period. For volumetric examination of Pump Studs, one of four sets of reactor coolant pump studs is selected for volumetric examination. For the visual examination of pump bolting, one of the reactor coolant pumps will be examined only if disassembled. This is the same requirement as for Examination Category B-L-2 and will be met during the repair replacement process. All other B-G-1 components are scheduled for examination.

This meets the Examination Category B-G-1 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.6 EXAMINATION CATEGORY B-G-2 - PRESSURE RETAINING BOLTING, 2" AND LESS IN DIAMETER

This category includes PZR relief valve bolting, reactor coolant pump seal bolting, valve bolting in the safety injection and shutdown cooling systems, steam generator manways and RPV closure head instrument nozzles. Examinations will be conducted as required in Table IWB-2500-1 in the 2001 Edition through the 2003 Addenda of Section XI. This bolting will only be examined if associated connections are disassembled.

For components other than piping, bolting examinations will be required only when the component is examined under Examination Category B-B, B-L-2, or B-M-2. ANO2 has grouped B-G-2 bolting in accordance with components examined under Examination Category B-B, B-L-2, or B-M-2. This grouping is identified in the Program Type field in ScheduleWorks.

This meets the Examination Category B-G-2 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.7 EXAMINATION CATEGORY B-J - PRESSURE RETAINING WELDS IN PIPING

This category addresses piping welds. ANO 2 has developed a Code Case N-716 RI-ISI program. All Examination Category B-J Welds have been re-categorized as R-A welds in accordance with Code Case N-716. Code Case N-716 has been submitted to the NRC via Request for Alternative ANO2-ISI-006. Therefore no examinations will be performed per Examination Category B-J.

7.1.8 EXAMINATION CATEGORY B-K – WELDED ATTACHMENTS FOR VESSELS, PIPING, PUMPS, AND VALVES

Examination Category B-K of the ASME Code Section XI, 2001 Edition through the 2003 Addenda requires examination of Integral Attachments. For vessel attachments Note 4 allows for multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. For single vessels, only one welded attachment shall be selected for examination. ANO Unit 2 has one attachment weld on each Steam Generator and one PZR attachment weld. One of the two S/G attachment welds, and the one PZR attachment weld are selected for examination or 66% of all vessel attachment welds.

For piping pumps and valves, inspection of 10% of the total population of integral welded attachments is required. 10% of all piping welded attachments and 10% of all pump welded attachments are selected for examination.

This meets the Examination Category B-K examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.9 EXAMINATION CATEGORIES B-L-1 AND B-L-2 - PRESSURE RETAINING WELDS IN PUMP CASINGS, AND PUMP CASINGS

This category involves reactor coolant pumps and requires visual examination on pump casing welds and pump internal pressure retaining surfaces when disassembled. The reactor coolant pumps are the only Code Class 1 pumps.

B-L-1 requires examination of one pump in each group of pumps performing similar functions in the system. Each Reactor Coolant Pump has three scroll welds. All the welds on one of the four Reactor Coolant Pumps are selected for examination meeting the 25% requirement.

B-L-2 requires examination of one pump in each group of pumps performing similar functions in the system. However, this examination is only required when a pump is dissembled for maintenance, repair, or volumetric examination. No Reactor Coolant Pumps have been selected. This requirement will be met during the repair/replacement process.

This meets the Examination Categories B-L-1 and B-L-2 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.10 EXAMINATION CATEGORIES B-M-1 AND B-M-2 - PRESSURE RETAINING WELDS IN VALVE BODIES, AND VALVE BODIES

This category only involves pressurizer safety, shutdown cooling, and safety injection valves. Examinations will be conducted as required in Table IWB-2500-1. There are twenty-one valves in Unit 2 within this examination category. The twenty-one valves are placed into seven groups and the groups are identified in the Program Type field in the IDDEAL Software Suite®, ScheduleWorks® computer program.

B-M-1 requires examination of one valve in each group of valves that are of the same size, constructural design, and manufacturing method, and that performs similar functions in the system. ANO 2 does not have Class 1 valves that contain a valve body weld.

B-M-2 requires examination of one valve in each group of valves that are of the same size, constructural design, and manufacturing method, and that performs similar functions in the system. ANO Unit 2 Class 1 valves have been separated into 7 valve groups. However, this examination is only required when a valve is dissembled for maintenance, repair, or volumetric examination. No valve body internal surfaces have been selected. This requirement will be met during the repair/replacement process.

This meets the Examination Categories B-M-1 and B-M-2 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.11 EXAMINATION CATEGORY B-N-1 - INTERIOR OF REACTOR VESSEL

These examinations will be conducted each inspection period.

This meets the Examination Category B-N-1 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.12 EXAMINATION CATEGORY B-N-2 - WELDED CORE SUPPORT STRUCTURES AND INTERIOR ATTACHMENTS TO REACTOR VESSEL

These examinations will be deferred until the third period as allowed in Table IWB-2500-1. The reactor vessel core support structures and interior attachments are discussed in Request for Alternative ANO2-ISI-005, which was submitted to extend the inspection interval to twenty years for these welds. This inspection is scheduled to coincide with the Reactor Vessel examinations. However, it cannot be deferred later than 2020.

This meets the Examination Category B-N-2 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI as modified by Request for Alternative ANO2-ISI-005.

7.1.13 EXAMINATION CATEGORY B-N-3 - REMOVABLE CORE SUPPORT STRUCTURES

These examinations will be conducted during the third period to coincide with the 10 year inspection of the reactor vessel. The reactor vessel core removable core support structures are discussed in Request for Alternative ANO2-ISI-005, which was submitted to extend the inspection interval to twenty years for these surfaces. However, it cannot be deferred later than 2020.

This meets the Examination Category B-N-2 examination requirements in the 2001 Edition through the 2003 Addenda of Section XI as modified by Request for Alternative ANO2-ISI-005.

7.1.14 EXAMINATION CATEGORY B-O - PRESSURE RETAINING WELDS IN CONTROL ROD HOUSING AND INSTRUMENT NOZZLE HOUSINGS

The ASME Code, Section XI, 2001 Edition through the 2003 Addenda, requires volumetric or surface examination of 10% of peripheral control rod drive housings during the inspection interval. There are 28 peripheral Control Rod Element Drives (CEDMs) on the reactor vessel head. To meet the Code requirements the four welds on three of the CEDMS have been selected for examination.

This meets the Examination Category B-O examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.15 EXAMINATION CATEGORY B-P - ALL PRESSURE RETAINING COMPONENTS

The pressure testing program at ANO 2 meets the requirements of ASME Code, Section XI, 2001 Edition through the 2003 Addenda for Class 1 systems. Details of the component listing are contained in the Pressure Test Program Plan.

7.1.16 EXAMINATION CATEGORY B-Q - STEAM GENERATOR TUBING

The Steam Generator Tube inspection program at ANO 2 is governed by ANO 2 Improved Technical Specification 6.5.9.

7.1.17 EXAMINATION CATEGORY C-A - PRESSURE RETAINING WELDS IN PRESSURE VESSELS

This category applies to the steam generators and shutdown cooling heat exchangers. Note (2) in Table IWC-2500-1, Examination Category C-A only requires examination of welds at gross structural discontinuities, such as, junctions between different thickness, shell to flange welds, cylindrical shell to conical shell, and head to shell welds. Note (3) states that "In the case of multiple vessels of similar design, size, and service, the required examinations may be limited to one vessel or distributed among the vessels or 50%." All the vessel welds on one S/G and one tubesheet-to-shell and one shell circumferential weld on a SCHE are selected for examination.

This meets the Examination Category C-A examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.18 EXAMINATION CATEGORY C-B - PRESSURE RETAINING NOZZLE WELDS IN VESSELS

This category applies to steam generators and shutdown cooling heat exchangers. Note (1) in Table IWC-2500-1, Category C-B, excludes manways and handholes. Note (3) requires that nozzles selected initially for examination shall be reexamined over the service life of the component. Note (5) allows that in the case of multiple vessels of similar design, size, and service the required examinations may be limited to one vessel or distributed among the vessels. The FW nozzle to vessel weld and inner radius on one S/G and all four nozzle pad to shell welds on a SCHE are selected for examination. Two nozzle to shell weld weep holes on one SCHE are selected for examination each period.

This meets the Examination Category C-B examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.19 EXAMINATION CATEGORY C-C - WELDED ATTACHMENTS FOR VESSELS, PIPING, PUMPS, AND VALVES

Examination Category C-C of the ASME Code Section XI, 2001 Edition through the 2003 Addenda requires examination of Integral Attachments. For vessel attachments Note 4 allows for multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. For single vessels, only one welded attachment shall be selected for examination. There are two steam generators with six attachment welds each (12 welds total). One of the twelve S/G attachment welds is selected for examination or 8.3% of all vessel attachment welds.

For piping pumps and valves, inspection of 10% of the total population of integral welded attachments is required. Ten percent of all piping welded attachments are selected for examination.

This meets the Examination Category C-C examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.20 EXAMINATION CATEGORY C-F-1- PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL OR HIGH ALLOY PIPING

This category addresses Class 2 piping welds. ANO Unit 2 has developed a Code Case N-716 RI-ISI program. All Examination Category C-F-1 welds have been re-categorized as R-A welds in accordance with Code Case N-716. Code Case N-716 has been submitted to the NRC via Request for Alternative ANO2-ISI-006. Therefore no examinations will be performed per Examination Category C-F-1.

7.1.21 EXAMINATION CATEGORY C-F-2 - PRESSURE RETAINING WELDS IN CARBON OR LOW ALLOY STEEL PIPING

This category addresses Class 2 piping welds. ANO Unit 2 has developed a Code Case N-716 RI-ISI program. All Examination Category C-F-2 Welds have been re-categorized as R-A welds in accordance with Code Case N-716. Code Case N-716 has been submitted to the NRC via Request for Alternative ANO2-ISI-006. Therefore no examinations will be performed per Examination Category C-F-2.

7.1.22 EXAMINATION CATEGORY C-G - PRESSURE RETAINING WELDS IN PUMPS AND VALVES

ANO Unit 2 does not contain any class 2 pumps or valves that have pressure retaining welds.

7.1.23 EXAMINATION CATEGORY C-H - ALL PRESSURE RETAINING COMPONENTS

The pressure testing program at ANO 2 meets the requirements of ASME Code, Section XI, 2001 Edition through the 2003 Addenda for Class 2 systems. Details of the component testing are contained in the Pressure Test Program Plan.

7.1.24 EXAMINATION CATEGORY D-A – WELDED ATTACHMENTS FOR VESSELS, PIPING, PUMPS, AND VALVES

Examination Category D-A of the ASME Code Section XI, 2001 Edition through the 2003 Addenda requires examination of Integral Attachments. ANO Unit 2 has no vessels attachment welds.

For piping, pumps and valves, inspection of 10% of the total population of integral welded attachments is required. Ten percent of all piping welded attachments are selected for examination. The selections are proportional to the total number of nonexempt welded attachments in each system.

This meets the Examination Category D-A examination requirements in the 2001 Edition through the 2003 Addenda of Section XI.

7.1.25 EXAMINATION CATEGORY D-B – ALL PRESSURE RETAINING COMPONENTS

The pressure testing program at ANO 2 meets the requirements of ASME Code, Section XI, 2001 Edition through the 2003 Addenda for Class 3 systems. Details of the component listing are contained in the Pressure Test Program Plan.

7.1.26 EXAMINATION CATEGORY F-A - SUPPORTS

Examination Category F-A of the ASME Code Section XI, 2001 Edition through the 2003 Addenda requires 25% of Class 1 Piping Supports, 15% of Class 2 Piping Supports, and 10% of Class 3 Piping Supports to be examined during the inspection interval. For multiple components other than piping, within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined. The supports have been separated by type as defined in Note (1) to Examination Category F-A. This type has been added to the Item Number to clearly identify each support by type. Twenty-five percent (25%) of the Class 1 supports have been selected and are prorated by type and system. Fifteen percent (15%) of the Class 2 supports have been selected and are prorated by type and system. Ten percent (10%) of the Class 3 supports have been selected and are prorated by type and system.

For supports, other than piping supports, the components have been scheduled as follows:

Note (3) requires only one component of multiple components of similar design, function, and service, to be scheduled for inspection. ANO2 scheduled the following supports:

- one Pressurizer Support;
- three Reactor Vessel Supports;
- one of two Steam Generator Supports
- four of sixteen Reactor Coolant Pump Supports;
- one of two LPSI Pump Supports;
- one of two Shutdown Cooling Heat Exchanger Supports;
- one of two Containment Spray Pumps Supports;
- one of three HPSI Pump Supports;

Thirteen of the thirty-one non piping supports are selected for examination or 42% of all non piping supports.

The selection of these component supports for examination meets the requirements of Examination Category F-A Examination Requirements in the ASME Code Section XI, 2001 Edition through the 2003 Addenda.

7.1.27 EXAMINATION CATEGORY R-A

The alternative Code Case N-716, RIS-B Program for piping as described in Request for Alternative ANO2-ISI-006. The RIS-B Program has been substituted for the current program for Class 1 and 2 piping (Examination Categories B-F, B-J, C-F-1 and C-F-2) in accordance with 10 CFR 50.55a(a)(3)(i) by alternatively providing an acceptable level of quality and safety. These welds are selected as provided in Structural Integrity Associates, Inc. (SI) Calculation 0800567.302, ANO-2 N-716 Application. The Calculation requires 81 welds be examined to meet Code Case N-716. However, the ScheduleWorks Database has 87 selected for examination. Six R-A welds (13-008, 15-008, 36-001, 37-001, 38-001, and 39-001) have been selected for Code Case N-722 only. These six weld appear in the database count but are not required for Code Case N-716.

7.1.28 CODE CASE N-722 - PWR CLASS 1 COMPONENTS FABRICATED WITH ALLOY 600/82/182 MATERALS

Code Case N-722 has been mandated by 10 CFR 50.55a. This Code Case requires examination of components containing Alloy 600/82/182 material. ANO2 has twelve Cold Leg Instrument Connections and eighteen Cold Leg Full Penetration Welds that require examination once per interval. The twelve Cold Leg Instrument Connections and six of the eighteen Cold Leg Full Penetration Welds will have a VT-2 visual examination in accordance with the Code Case. Twelve of the eighteen Cold Leg Full Penetration Welds will have an ultrasonic examination in accordance with the RI-ISI Program in accordance with Request for Alternative ANO2-ISI-006. These examinations are scheduled in the interval in accordance with Table IWB-2412-1.

The selection of these welds for examination meets the requirements of Code Case N-722 examination requirements as mandated in 10 CFR 50.55a.

7.1.29 CODE CASE N-729-1 - PRESSURE RETAINING PARTIAL PENETRATION WELDS IN VESSELS

Code Case N-729-1 has been mandated by 10 CFR 50.55a. This Code Case requires examination of Reactor Vessel Upper Heads. Based on the susceptibility of materials, the Reactor Vessel Head will be visually examined every refueling outage and the Nozzles and Partial-Penetration Welds in the head will be volumetrically examined every refueling outage. Additionally, ANO2 has made a commitment (R-18870) in letter number 2CAN020901 to perform the volumetric examination of the head every refueling outage.

The selection of these welds for examination meets the requirements of Code Case N-729-1 examination requirements as mandated in 10 CFR 50.55a.

7.2 Augmented Program

7.2.1 RG 1.14 Reactor Coolant Pump Flywheel Inspections

The Reactor Coolant Pump Motor flywheels will be inspected as required by ANO2 Technical Specification 6.5.7. Inservice inspection of each reactor coolant pump flywheel shall be performed at least once every ten years in accordance with Regulatory Guide 1.14, Revision 1, August 1975, section C.4.B.1. The RCP Flywheels are scheduled to meet these augmented requirements.

7.2.2 MRP- 139 Category A Welds

Welds of Resistant Material have a MRP-139 requirement to be examined per the existing Code Program or approved alternative. ANO Unit 2 has 5 welds that are Category A welds and included in the ANO2 N-716 Risk Informed Program.

This meets the Augmented Program MRP Category A examination requirements.

7.2.3 MRP- 139 Category E Welds

Cold Leg Welds >4 inches of Non-Resistant Material that have not been Mitigated by SI have a MRP-139 requirement of 100% examination each 6 years. ANO Unit 2 has twelve welds that are Category E welds that are either Code Item Number R1.11 or R1.20. These welds are selected for examination under the MRP Category E Augmented Program.

This meets the Augmented Program MRP Category E examination requirements.

7.2.4 MRP- 139 Category F Welds

Welds of Non-Resistant Material that are cracked and have been reinforced by full structural weld overlay have a MRP-139 requirement of once in the next 5 years; if no additional indications/growth, continue with existing Code examination program for unflawed condition or approved alternative. ANO Unit 2 has three welds that are Category F welds, two are Code Item Number R1.15 and one is Code Item Number R1.11/15. All of these welds are selected for examination under the MRP Category F Augmented Program.

This meets the Augmented Program MRP Category F examination requirements.

7.2.5 MRP- 192 Welds

RHR Mixing Tee Thermal fatigue was noted in a French Plant in 1998. A review of US Plants by EPRI determined that each plant should perform an evaluation to identify which welds may be susceptible. ANO 2 has completed this evaluation see LO-HQNLO-2007-0009. The results determined that three welds should be examined for Thermal Fatigue. These welds are in low safety significant piping per ANO2's Code Case N-716 RI-ISI Program. All of these welds are selected for examination under the MRP- 192 Augmented Program. The examiners must complete the MRP-36 Web Based Training Module.

This meets the Augmented Program MRP-192 examination requirements.

7.2.6 NUREG -0612 Heavy Loads

The special lifting devices addressed by this augmented examination are the RPV Head and Internals Lift Rigs, including the tripod with cables and turnbuckles, the internals handling adaptor, the internals handling extension and the stainless steel lifting cables and adapters. The subject components shall be subject to a surface examination and /or VT-3 visual examination to be performed once every ten years. Fifty (50) welds have been scheduled during this interval to meet this augmented requirement.

7.2.7 Dry Spent Fuel Storage Cask

Visual inspections shall be performed on dry spent fuel storage casks in accordance with Sections 1.3.2 and 1.3.3 of the storage cask's "Certificate of Compliance" which was issued in accordance with 10 CFR Part 72. An external visual examination of all loaded casks shall be performed once per year. In addition, a visual inspection of the internal space of the first-loaded cask shall be performed once every 5 years beginning from the date it was loaded. Examinations have been scheduled to meet these augmented requirements.

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
B-A(1)	**Pressure Retaining Welds in Reactor Vessel**									
B-A	B1.11	Reactor Vessel Circumferential Shell Welds	Volumetric	3	3	100%	All Welds	0	0	3
B-A	B1.12	Reactor Vessel Longitudinal Shell Welds	Volumetric	9	9	100%	All Welds	0	0	9
B-A	B1.21	Reactor Vessel Circumferential Head Welds	Volumetric	2	2	100%	Accessible Length of All Welds	0	0	2
B-A	B1.22	Reactor Vessel Meridional Head Welds	Volumetric	10	10	100%	Accessible Length of All Welds	0	0	10
B-A	B1.30	Reactor Vessel Shell-to-Flange Weld	Volumetric	1	1	100%	Weld	0	0	1
B-A	B1.40	Reactor Vessel Head-to-Flange Weld	Volumetric and Surface	1	1	100%	Weld	0	0	1
		Category Total		**26**	**26**			**0**	**0**	**26**

Notes for Cat. B-A	Note 1: Request for Alternative ANO2-ISI-004 was submitted in the third interval to extend the inspection interval to 20 years for all reactor vessel welds. The welds were last examined in the spring of 1999 and are scheduled in 2018.

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
B-B	**Pressure Retaining Welds in Vessels Other Than Reactor Vessels**									
B-B	B2.11	Pressurizer Shell-to-Head Welds Circumferential	Volumetric	2	2	100%	Both welds	1	0	1
B-B	B2.40	Steam Generators (Primary Side) Tubesheet-to-Head Weld	Volumetric	2	1	50%(1)	Weld	0	1	0
			Category Total	**4**	**3**			**1**	**1**	**1**
Notes for Cat. B-B		Note 1: The examination may be limited to one vessel among the group of vessels performing a similar function. (Ref. Table IWB-2500-1, Examination Category B-B, Note 1)								
B-D	**Full Penetration Welded Nozzles in Vessels**									
B-D	B3.90	Reactor Vessel Nozzle-to-Vessel Welds	Volumetric	6	6	100%	Same as 1st Interval	0	0	6(1)
B-D	B3.100	Reactor Vessel Nozzle Inside Radius Section	Volumetric	6	6	100%	Same as 1st Interval3)	0	0	6(1)
B-D	B3.110	Pressurizer Nozzle-to-Vessel Welds	Volumetric	5	5	100%	Same as 1st Interval	4	1	0
B-D	B3.120	Pressurizer Nozzle Inside Radius Section	Volumetric or visual	5	5	100%	All nozzles(2)(3)	4	1	0
B-D	B3.130	Steam Generators (Primary Side) Nozzle-to-Vessel Welds	Volumetric	6	6	100%	Same as 1st Interval	0	6	0
B-D	B3.140	Steam Generators (Primary Side) Nozzle Inside Radius Section	Volumetric or visual	6	6	100%	All nozzles(2)(3)	0	6	0

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
		Category Total		**34**	**34**			**8**	**14**	**12**
Notes for Cat. B-D		Note 1: Request for Alternative ANO2-ISI-004 was submitted in the third interval to extend the inspection interval to 20 years for all reactor nozzle vessel welds and inner radii. The welds were last examined in the spring of 1999 and are scheduled in 2018. Note 2: 10 CFR 50.55a(b)(2)(xxi)(A) requires that the provisions of Table IWB–2500–1, Examination Category B–D, Code Items B3.120 and B3.140 in the 1998 Edition must be applied. Note 3: 10 CFR 50.55a(b)(2)(xxi)(A) allows use of a visual examination with magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria in Table IWB–3512–1, with a limiting assumption on the flaw aspect ratio (i.e., a/l=0.5), in lieu of an ultrasonic examination.								
B-G-1	**Pressure Retaining Bolting, Greater Than 2 in. (50 mm) in Diameter**									
B-G-1	B6.10	Reactor Vessel Closure Head Nuts	Visual, VT-1	1	1	100%	Same as for 1st interval	0	0	1
B-G-1	B6.20	Reactor Vessel Closure Studs	Volumetric	1	1	100%(4)	Same as for 1st interval	0	0	1
B-G-1	B6.40	Reactor Vessel Threads in Flange	Volumetric	1	1	100%	Same as for 1st interval	0	0	1
B-G-1	B6.50	Reactor Vessel Closure Washers, Bushings	Visual, VT-1	1	1	100%	Same as for 1st interval	0	0	1
B-G-1	B6.180	Pump Bolts and Studs	Volumetric	4	1	25%(2) (4)	Same as for 1st interval	0	0	1
B-G-1	B6.190	Pumps Flange Surface when connection disassembled	Visual, VT-1	4	0	0%(1)(3)	Same as for 1st interval	0	0	0
B-G-1	B6.200	Pumps Nuts, Bushings, and Washers	Visual, VT-1	4	0	0%(1)(3)	Same as for 1st interval	0	0	0
		Category Total		**16**	**5**			**0**	**0**	**5**

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
Notes for Cat.B-G-1		Note 1: Not Required unless disassembled Note 2: Volumetric examination of bolting of heat exchangers, pump, or valves may be conducted on one heat exchanger, one pump, or one valve among a group of heat exchangers, pumps, or valves that are similar in design, type, and function. (Ref. Table IWB-2500-1, Examination Category B-G-1, Note 3). Note 3: For heat exchangers, piping, pumps, and valves, visual examinations are limited to components selected for examination under Examination Categories B-B, B-J, B-L-2, and B-M-2. (Ref. Table IWB-2500-1, Examination Category B-G-1, Note 3) Note 4: If bolts or studs are removed for examination, surface examination meeting the acceptance standards of IWB-3515 may be substituted for volumetric examination.								
B-G-2	**Pressure Retaining Bolting, 2in. (50 mm) and Less in Diameter**									
B-G-2	B7.10	Reactor Vessel Bolts, Studs, and Nuts	Visual, VT-1	8	0	0%(1)	Same as for 1st interval(2)	0	0	0
B-G-2	B7.20	Pressurizer Bolts, Studs, and Nuts	Visual, VT-1	1	0	0%(1)	Same as for 1st interval(2)(3)	0	0	0
B-G-2	B7.30	Steam Generator Bolts, Studs, and Nuts	Visual, VT-1	4	0	0%(1)	Same as for 1st interval(2)(3)	0	0	0
B-G-2	B7.50	Piping Bolts, Studs, and Nuts	Visual, VT-1	7	0	0%(1)(4)	Same as for 1st interval (2)	0	0	0
B-G-2	B7.70	Valves Bolts, Studs, and Nuts	Visual, VT-1	21	0	0%(1)(5)	Same as for 1st interval (2)(3)	0	0	0
		Category Total		**41**	**0**			**0**	**0**	**0**

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
Notes for Cat.B-G-2		Note 1: Not required unless disassembled Note 2: Examination is only required once per interval Note 3: For vessels, pumps, and valves, examinations are limited to components selected for examination under Examination Categories B-B, B-L-2, and B-M-2. (Ref. Table IWB-2500-1, Examination Category B-G-2, Note 2) Note 4: Examination is limited to at least one piping flange in each group of piping flanges that are of the similar design, size, function, and service in the system. ANO 2 piping flanges are grouped into seven groups under the Program Type field in ScheduleWorks. Note 5: Only one valve of each group of valves is required as outlined in B-M-2								
B-K	**Welded Attachments for Vessels, Piping, Pumps, and Valves**									
B-K	B10.10	Pressure Vessels Welded Attachments	Surface	3	2	66%(1)(2)	Same as for 1st interval	0	2	0
B-K	B10.20	Piping Welded Attachments	Surface	10	1	10%	Same as for 1st interval	1	0	0
B-K	B10.30	Pump Welded Attachments	Surface	16	2	10%	Same as for 1st interval	0	0	2
		Category Total		**29**	**5**			**1**	**2**	**2**
Notes for Cat. B-K		Note 1: For multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. For single vessels, only one welded attachment shall be selected for examination. Note 2: There is one welded attachment on the PZR and 1 on each S/G for a total of 3. Must examine 1 on each vessel or multiple vessels, therefore 2 are required for 66%								
B-L-1	**Pressure Retaining Welds in Pump Casings**									

Table 7.1 ANO Unit 2 Code Category Summary										
Category	**Item Number**	**Description**	**Exam Method**	**Number of Components in Item No.**	**Required to be Examined During Interval**	**Examination Percentage Required**	**Number to be Examined in Interval**	**Number to be Examined in First Period**	**Number to be Examined in Second Period**	**Number to be Examined in Third Period**
B-L-1	B12.10	Pumps Pump Casing Welds (B-L-1)	Visual, VT-1	12	3	25%(1) (2)	Same as for first interval	0	0	3
			Category Total	**12**	**3**			**0**	**0**	**3**
Notes for Cat. B-L-1	Note 1: Examination is limited to at least one pump in each group of pumps performing similar functions in the system. Note 2: There are four Reactor Coolant Pumps. Each pump has three casing welds, therefore 3 welds of 12 are required for 25%									
B-L-2	**Pump Casings**									
B-L-2	B12.20	Pumps Pump Casing (B-L-2)	Visual, VT-3	4	0	0%(1)(2)	Same as for first interval	0	0	0
			Category Total	**4**	**0**			**0**	**0**	**0**
Notes for Cat. B-L-2	Note 1: Examination is limited to at least one pump in each group of pumps performing similar functions in the system. Note 2: Examination is required only when a pump is disassembled for maintenance, repair, or volumetric examination. Examination of the internal pressure boundary shall include the internal pressure retaining surfaces made accessible by disassembly.									
B-M-2	**Valve Bodies**									

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
B-M-2	B12.50	Valve Body, Exceeding NPS 4 (DN 100) (B-M-2)	Visual, VT-3	21	0	0%(1)(2)	Same as for first interval	0	0	0
			Category Total	**21**	**0**			**0**	**0**	**0**
Notes for Cat. B-M-2		Note 1: Examination is limited to at least one valve in each group of valves that are of the same size, constructural design, manufacturing method, and that perform similar functions in the system. Note 2: Not required unless disassembled								
B-N-1	**Interior of Reactor Vessel**									
B-N-1	B13.10	Reactor Vessel, Vessel Interior (B-N-1)	Visual, VT-3	1	3(1) (2)	100%	Each inspection period	1	1	1
			Category Total	**1**	**3**(1)			**1**	**1**	**1**
Notes for Cat B-N-1		Note 1: Examination of this item number is required each period. Therefore the number required during the interval is three times the total number of components. This is also reflected in the category total. Note 2: Examination is limited to the pressure retaining surfaces made accessible by removal of components during normal refueling operations.								
B-N-2	**Welded Core Support Structures and Interior Attachments to Reactor Vessels**									

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
B-N-2	B13.50	Reactor Vessel (PWR) Interior Attachments Within Beltline Region (B-N-2)	Visual, VT-1	12	12	100%	Same as for 1st interval	0	0	12(1)
B-N-2	B13.60	Reactor Vessel (PWR) Interior Attachments Beyond Beltline Region (B-N-2)	Visual, VT-3	10	10	100%	Same as for 1st interval	0	0	10(1)
		Category Total		**22**	**22**			**0**	**0**	**22**
Notes for Cat. B-N-2		Note 1: Request for Alternative ANO2-ISI-005 was submitted in the third interval to extend the inspection interval to 20 years for reactor vessel welded core support structures and interior attachments. These were last examined in the spring of 1999 and are scheduled in 2018. This request requires these examinations to be completed on or before March 25, 2020.								
B-N-3	**Removable Core Support Structures**									
B-N-3	B13.70	Reactor Vessel (PWR) Core Support Structure (B-N-3)	Visual, VT-3	10	10	100%	Same as for 1st interval	0	0	10(1)
		Category Total		**10**	**10**			**0**	**0**	**10**
Notes for Cat. B-N-3		Note 1: Request for Alternative ANO2-ISI-005 was submitted in the third interval to extend the inspection interval to 20 years for reactor vessel removable core support structures. These were last examined in the spring of 1999 and are scheduled in 2018. This request requires these examinations to be completed on or before March 25, 2020.								
B-O	**Pressure Retaining Welds in Control Rod Drive and Instrument Nozzle Housings**									

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
B-O	B14.20	Reactor Vessel (PWR) Welds in Control Rod Drive CRD Housing	Volumetric or surface	112	12	10%	10% peripheral CRD housings(1)	0	0	12
			Category Total	**112**	**12**			**0**	**0**	**12**
Notes for Cat. B-O		Note 1: There are 28 Peripheral CEDMs, 10% of 28 is 3. There are 4 welds per CEDM for a total of 112 welds. Therefore, 12 welds are selected out of 112.								
C-A	**Pressure Retaining Welds in Pressure Vessels**									
C-A	C1.10	Pressure Vessels Shell Circumferential Welds	Volumetric (5)	2	1	50%(1)(2)	Each inspection interval	1	0	0
C-A	C1.20	Pressure Vessels Head Circumferential Welds	Volumetric (5)	2	1	50%(1)(3)	Each inspection interval	0	1	0
C-A	C1.30	Pressure Vessels Tubesheet-to-Shell Weld	Volumetric (5)	4	2	50%(1)(4)	Each inspection interval	1	0	1
			Category Total	**8**	**4**			**2**	**1**	**1**

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
Notes for Cat. C-A		Note 1: The examination may be limited to one vessel among the group of vessels of similar design, size, and function. (Ref. Table IWC-2500-1, Examination Category C-A, Note 3) Note 2: There is one circumferential shell weld on both SDCHX, requiring only 1 SDCHX shell weld be scheduled or 1 of 2 shell welds are required to be examined for 50% Note 3: There is one circumferential head weld on both S/G, therefore, 1 of 2 head welds are required to be examined or 50% Note 4: There is one tubesheet-to-shell weld on both S/G & one tubesheet-to-shell weld on both SDCHX, therefore 2 of 4 tubesheet-to-shell welds are required to be examined for 50%.								
C-B	**Pressure Retaining Nozzle Welds in Vessels**									
C-B	C2.21	Nozzles Without Reinforcing Plate in Vessels > 1/2in. (13mm) Nominal Thickness Nozzle-to-Shell (Nozzle to Head or Nozzle to Nozzle) Weld	Surface and volumetric	2	1	50%[(1)(2)]	Each inspection interval	0	1	0
C-B	C2.22	Nozzles Without Reinforcing Plate in Vessels > 1/2 in. (13mm) Nominal Thickness Nozzle Inside Radius Section	Volumetric	2	1	50%[(1)(3)]	Each inspection interval	0	1	0
C-B	C2.31	Nozzles With Reinforcing Plate in Vessels > 1/2 in. (13mm) Nominal Thickness Reinforcing Plate Welds to Nozzle and Vessel	Volumetric	8	4	50%[(1)(4)]	Each inspection interval	0	0	4

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
C-B	C2.33	Nozzles With Reinforcing Plate in Vessels > 1/2 in. (13mm) Nominal Thickness Nozzle-to-Shell (Nozzle to Head or Nozzle to Nozzle) Welds When Inside of Vessel Is Inaccessible	Visual	4	2	50%(1)(5)	Each inspection interval	2	0	0
		Category Total		**16**	**8**			**2**	**2**	**4**
Notes for Cat. C-B		Note 1: The examination may be limited to one vessel among the group of vessels of similar design, size, and function. (Ref. Table IWC-2500-1, Examination Category C-B, Note 4) Note 2: There is one feed water nozzle on both S/G, therefore 1 of 2 nozzles are required to be examined or 50% Note 3: There is one feed water nozzle inner radius on both S/G, therefore, 1 of 2 inner radius is required to be examined or 50%. Note 4: There are one inlet and one outlet nozzle with two welds each on both SDC HX, therefore, 4 of 8 welds are required to be examined or 50%. Note 5: There is one inlet and one outlet nozzle weep hole on both SDC HX, therefore, 2 of 4 nozzle weep holes are required to be examined or 50%. This is a VT-2 examination of the weep hole conducted during the system leakage test each period.								
C-C	**Welded Attachments for Vessels, Piping, Pumps, and Valves**									
C-C	C3.10	Pressure Vessels Welded Attachments(1)	Surface	12	1	8.3%	Each identified occurrence and each inspection interval (1)(2)(3)	0	1	0

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
C-C	C3.20	Piping Welded Attachments	Surface	131	14	10%	Each identified occurrence and each inspection interval(3)	4	4	6
		Category Total		**143**	**15**			**4**	**5**	**6**
Notes for Cat. C-C		Note 1: For multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. For single vessels, only one welded attachment shall be selected for examination. (Ref. Table IWC-2500-1, Examination Category C-C, Note 4) Note 2: There are six welded attachments on each S/G, therefore 1 of 12 welded attachments are required to be examined for 8.3% Note 3: Examination is required whenever component support member deformation is identified. (Ref. Table IWC-2500-1, Examination Category C-C, Note 6)								
D-A	**Welded Attachments for Vessels, Piping, Pumps, and Valves**									
D-A	D1.20	Piping Welded Attachments	Visual, VT-1	88	9	10%	Each identified occurrence(1) and each inspection interval	3	3	3
		Category Total		**88**	**9**			**3**	**3**	**3**
Notes for Cat. D-A		Note 1: Examination is required whenever component support member deformation is identified. (Ref. Table IWD-2500-1, Examination Category D-A, Note 4)								

Table 7.1 ANO Unit 2 Code Category Summary										
Category	**Item Number**	**Description**	**Exam Method**	**Number of Components in Item No.**	**Required to be Examined During Interval**	**Examination Percentage Required**	**Number to be Examined in Interval**	**Number to be Examined in First Period**	**Number to be Examined in Second Period**	**Number to be Examined in Third Period**
F-A	**Supports**									
F-A	F1.10	Class 1 Piping Supports - Snubbers	Visual, VT-3	73	18	(1)	Each inspection interval	6	3	9
F-A	F1.10A	Class 1 Piping Supports - One Directional	Visual, VT-3	80	20	(1)	Each inspection interval	6	4	10
F-A	F1.10B	Class 1 Piping Supports - Multi-directional	Visual, VT-3	38	10	(1)	Each inspection interval	5	2	3
F-A	F1.10 C	Class 1 Piping Supports - Thermal Movement	Visual, VT-3	50	13	(1)	Each inspection interval	4	5	4
F-A	**F1.10**	**Total Class 1 Piping Supports**	**Visual, VT-3**	**241**	**61**	**25%**	**Each inspection interval**	**21**	**14**	**26**
F-A	F1.20	Class 2 Piping Supports - Snubbers	Visual, VT-3	44	7	(1)	Each inspection interval	1	2	4
F-A	F1.20A	Class 2 Piping Supports - One Directional	Visual, VT-3	147	22	(1)	Each inspection interval	7	8	7
F-A	F1.20B	Class 2 Piping Supports - Multi-directional	Visual, VT-3	142	21	(1)	Each inspection interval	2	8	11

Table 7.1 ANO Unit 2 Code Category Summary										
Category	**Item Number**	**Description**	**Exam Method**	**Number of Components in Item No.**	**Required to be Examined During Interval**	**Examination Percentage Required**	**Number to be Examined in Interval**	**Number to be Examined in First Period**	**Number to be Examined in Second Period**	**Number to be Examined in Third Period**
F-A	F1.20C	Class 2 Piping Supports - Thermal Movement	Visual, VT-3	98	15	(1)	Each inspection interval	3	8	4
F-A	**F1.20**	**Total Class 2 Piping Supports**	**Visual, VT-3**	**431**	**65**	**15%**	**Each inspection interval**	**13**	**26**	**26**
F-A	F1.30	Class 3 Piping Supports - Snubbers	Visual, VT-3	12	1	(1)	Each inspection interval	0	0	1
F-A	F1.30A	Class 3 Piping Supports - One Directional	Visual, VT-3	106	11	(1)	Each inspection interval	6	1	4
F-A	F1.30B	Class 3 Piping Supports - Multi-directional	Visual, VT-3	191	19	(1)	Each inspection interval	4	11	4
F-A	F1.30C	Class 3 Piping Supports - Thermal Movement	Visual, VT-3	40	4	(1)	Each inspection interval	1	2	1
F-A	**F1.30**	**Class 3 Piping Supports**	**Visual, VT-3**	**349**	**35**	**10%**	**Each inspection interval**	**11**	**14**	**10**
F-A	**F1.40**	**Supports other than Piping Supports (Class 1,2,3, and MC)**	**Visual, VT-3**	**31**	**13**	**42%**	**Each inspection interval[(2)(3)]**	**3**	**4**	**6**
			Category Total	**1052**	**174**	(1)		**48**	**58**	**68**

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
Notes for Cat. F-A		Note 1: The total percentage sample shall be comprised of supports from each system, where the individual sample sizes are proportional to the total number of non-exempt supports of each type and function within each system. (Ref. Table IWF-2500-1, Examination Category F-A, Note 2) Note 2: For multiple components other than piping, within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined. (Ref. Table IWF-2500-1, Examination Category F-A, Note 3) Note 3: One PZR, three RPV, one of two S/G, four of sixteen RCPs, one of two LPSI Pump, one of two SCHEs, one of two CS Pumps, one of three HPSI Pump. Therefore 13 of 31 component supports are required to be examined for 42%.								
R-A	**Risk Informed Piping Welds**									
R-A	R0.00	N-716 LSS Elements that have not been Evaluated for Degradation		1655	0	0%(1)		0	0	0
R-A	R1.11	N-716 Elements Subject to Thermal Fatigue	Volumetric	91	39(4)	42.8%(1)	Element	16	11	12
R-A	R1.11/15	N-716 Elements Subject to Thermal Fatigue and PWSCC	Volumetric	1	0(2)	0%(2)	Element	0	0	0
R-A	R1.15	N-716 Elements Subject to PWSCC	Volumetric	2	0(2)	0%(2)	Element	0	0	0
R-A	R1.16	N-716 Elements Subject to Intergranular or Transgranular Stress Corrosion Cracking (IGSCC, TGSCC)	Volumetric	5	2	40%(1)	Element	0	1	1
R-A	R1.20	N-716 Elements not Subject to a Damage Mechanism	Volumetric	690	40(4)	5.79%(1)(3)	Element	7	17	16

Table 7.1 ANO Unit 2 Code Category Summary										
Category	**Item Number**	**Description**	**Exam Method**	**Number of Components in Item No.**	**Required to be Examined During Interval**	**Examination Percentage Required**	**Number to be Examined in Interval**	**Number to be Examined in First Period**	**Number to be Examined in Second Period**	**Number to be Examined in Third Period**
		Category Total		**2444**	**81**[5]			**23**	**29**	**29**
Notes for Cat. R-A		Note 1: Percentages were determined using SI Calc 0800567.302 Revision 0. These are for tracking only, weld substitution is determined using Calc 0800567.302. Note 2: MRP-139 will be used for the inspection and management of PWSCC susceptible welds. Note 3: Two welds 29-008 and 29-009 require VT-2 examination only. Note 4: Volumetric examination of the following twelve Cold Leg Full Penetration Welds are credited to meet the visual examination requirements of Code Case N-722: 08-014, 09-008, 10-014, 11-008, 12-014, 14-014, 21-001, 22-001, 23-001, 24-001, 40-026, and 41-040. If any of these components are deselected from the RI-ISI schedule, then they must be added to the Code Case N-722 schedule for a VT-2 visual examination. Note 5: The SI Calculation requires 81 welds be examined to meet Code Case N-716. However, the ScheduleWorks Database has 87 selected for examination. Six R-A welds (13-008, 15-008, 36-001, 37-001, 38-001, and 39-001) have been selected in Iddeal for Code Case N-722 only. These six welds appear in the database count but are not required for Code Case N-716.								
A-600		**Code Case N-722 PWR Class 1 Components Fabricated with Alloy 600/82/182 Materials**[1]								
A-600	B15.205	Cold Leg Instrument Connections	Visual, VE	12	12	100%	Each inspection interval	3	0	9
R-A	R1.11	Cold Leg Full Penetration Welds	Visual, VE	2	2[2][3]	100%	Each inspection interval	0	1	1
R-A	R1.20	Cold Leg Full Penetration Welds	Visual, VE	16	16[2][3]	100%	Each inspection interval	3	12	1
		Category Total		30	30			**6**	**13**	**11**

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
Notes for Cat. N-722		Note 1: These examinations are in accordance with Code Case N-722 as required by 10 CFR 50.55a(g)(6)(B). Note 2: An ultrasonic examination from either the ID or the OD in accordance with the requirements of Appendix VIII shall be acceptable in lieu of the Visual, VE. Note 3: These R-A, R1.11 and R1.20 components comprise the 18 components subject to examination under the rules of N-722, Table 1, Cat. A-600, Item No. B15.215.								
A-600		**Code Case N-729-1 PWR Reactor Pressure Vessel Upper Head(1)**								
A-600	B4.10	Reactor Vessel Head with UNS N0600 nozzles and UNS N06082 or UNS W86182 Nozzle partial Penetration Welds	Visual, VE	1	7 (2)	100%	Every refueling outage	2	3	2
A-600	B4.20	Reactor Vessel Head UNS N0600 nozzles and UNS N06082 or UNS W86182 partial penetration welds in head	Volumetric &/or Surface	1	7 (2) (3)	100%	Every refueling outage	2	3	2
		Category Total		**2**	**14**(2)			**4**	**6**	**4**
Notes for Cat. A600/N-729-1		Note 1: These examinations are in accordance with Code Case N-729-1 as required by 10 CFR 50.55a(g)(6)(B). Note 2: Examination of this item number is required each outage. Therefore the number required during the interval is seven times the total number of components. This is also reflected in the category total. Note 3: ANO2 has made a commitment (R-18870) in letter number 2CAN020901 to perform the volumetric examination of the head every refueling outage.								
MRP-139A		**Mitigated Welds of Non-Resistant Material**								

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
R-A	R1.11	MRP 139 Category A Welds of Resistant Material as Susceptible to Thermal Fatigue	(1)	2	0	(1)		0	0	0
R-A	R1.20	MRP 139 Category A Welds of Resistant Material that are in the RI-ISI Program as no DM	(1)	5	0	(1)		0	0	0
		Category Total		**7**	**0**			**0**	**0**	**0**
Notes for MRP-139A		Note 1: Welds are to be examined under the existing Code Examination Program or approved alternative.								
MRP-139E		**Non Mitigated Welds of Non-Resistant Material**								
R-A	R1.20	MRP 139 Category E Welds that are in the RI-ISI Program as no DM	Volumetric (MRP 139 Cat E)	12	12	100(1)		0	12	0
		Category Total		**12**	**12**			**0**	**12**	**0**
Notes for MRP-139E		Note 1: Cold Leg Welds >4 inches of Non-Resistant Material that have not been Mitigated by SI have a MRP-139 requirement of 100% examination each 6 years								
MRP-139F		**Welds of Non-Resistant Material that are Cracked and have a Weld Overlay**								
R-A	R1.11/15	MRP 139 Category F Welds that are Susceptible to Thermal Fatigue and PWSCC	Volumetric	1	1	100(1)		1	0	0

Table 7.1 ANO Unit 2 Code Category Summary										
Category	**Item Number**	**Description**	**Exam Method**	**Number of Components in Item No.**	**Required to be Examined During Interval**	**Examination Percentage Required**	**Number to be Examined in Interval**	**Number to be Examined in First Period**	**Number to be Examined in Second Period**	**Number to be Examined in Third Period**
R-A	R1.15	MRP 139 Category F Welds that are Susceptible to PWSCC	Volumetric	2	2	100[(1)]		2	0	0
		Category Total		**3**	**3**			**3**	**0**	**0**
Notes for MRP-139F		Note 1: Welds of Non-Resistant Material that are cracked and have a weld overlay have a MRP-139 requirement Once in the next 5 years; if no additional indications/growth, continue with existing Code examination program for unflawed condition or approved alternative.								
MRP-192		**Cold Leg Welds of Non-Resistant Material**								
R-A	R0.00	MRP 192 Welds that are Low Safety Significant	Volumetric (MRP 36)	3	3	100[(1)]		3	0	0
		Category Total		**3**	**3**			**3**	**0**	**0**
Notes for MRP-192		Note 1: Examination of MRP-192 welds is driven by LO-HQNLO-2007-00009								
RG 1.14		**RCP FLYWHEEL**								
RG	RG1.14	RCP Flywheels	UT, ECT	4	4	(1)		0	2	2
		Category Total		**4**	**4**	**(1)**		**0**	**2**	**2**
Notes for RG 1.14		Note 1: Inservice inspection of each reactor coolant pump flywheel shall be performed at least once every ten years.								
NUREG-0612		**Heavy Loads**								

Table 7.1 ANO Unit 2 Code Category Summary

Category	Item Number	Description	Exam Method	Number of Components in Item No.	Required to be Examined During Interval	Examination Percentage Required	Number to be Examined in Interval	Number to be Examined in First Period	Number to be Examined in Second Period	Number to be Examined in Third Period
X-AUG	N/A	RVH and Internals Lift Rig(1)	Surface \ VT-3	50	50	100%	Once each inspection interval	0	50	0
		Category Total		**50**	**50**	**100%**		**0**	**50**	**0**
Notes for NUREG-0612 HEAVY LOADS		Note 1: The surface examination on critical welds and VT-3 of all other components shall be performed once every ten years.								
Dry Spent Fuel Storage Casks		**Dry Spent Fuel Casks(1)**								
X-Aug	N/A	External Examinations	VT	1(2)	1	100%		0	0	1
X-Aug	N/A	Internal Examinations	VT	1(3)	1	100%		0	0	1
		Category Total		**2**	**2**			**0**	**0**	**2**
Notes for Dry Spent Fuel Storage Casks		Note 1: The twenty four DSF Storage Casks are inclusive under Component ID VSC-24 in ScheduleWorks. Note 2: External visual examinations shall be performed annually. Note 3: An internal visual examination shall be performed every 5th year on the first loaded Dry Spent Fuel Storage Cask.								

8.0 INSERVICE INSPECTION DATA MANAGEMENT SOFTWARE

8.1 The Inservice Inspection Data Management software is comprised of a series of program modules assembled in a comprehensive software package entitled the Iddeal Software Suite®. This software suite is NETWORK based within the Entergy system and is accessible by any computer within Entergy.

8.2 The Iddeal Software Suite® is a quality level B software. It is the Controlled copy of the ISI Schedule. The software has limited access to protect the contents of the databases. Access to the software is limited through the use of a user defined password controlled via Central Engineering Procedure CEP-COS-100.

8.3 Access to the Iddeal Software Suite® is obtained through the Windows Citrix™ icon entitled the "Iddeal Software Suite®." The following programs comprise the IDDEAL SOFTWARE SUITE®:

- **IDDEAL®** - IDDEAL® is used to track and progress completion of outage examinations. Generates various reports to status examinations.
- **SCHEDULEWORKS®** - Maintains the complete ISI database. Outage schedules are assembled and progressed for interval and period statistics.
- **CERTWORKS®** - Maintains and tracks the personnel certifications of inspectors.
- **EQUIPWORKS®** - Maintains and tracks the NDE equipment certifications.
- **SNUBWORKS®** - Used to track all work associated with plant snubbers.

8.4 The ScheduleWorks® Module contains the ANO2 information necessary to perform ISI and Augmented Program. Maintenance of the Module is controlled via Central Engineering Procedure CEP-COS-110. All changes to data in the ANO2 ISI Database must be made in accordance with CEP-COS-110.

8.5 The controlled Iddeal Software Suite® houses the information below which meets the requirements of ASME Section XI, IWA-2420(b).

8.5.1 Identification of the components selected for examination and test, including successive exams from prior periods;

8.5.2 The Code requirements by examination category and item number for each component and the examination or test to be performed and the extent of the examination or test.

8.5.3 Identification of drawings showing items that require examination;

8.5.4 List of examination procedures;

8.5.5 Description of alternative examinations and identification of components to be examined using alternative methods;

8.5.6 Identification of calibration blocks used for ultrasonic examination.

9.0 Examination Evaluation Criteria

Evaluation of indications detected by volumetric or surface examination during the preservice or inservice inspection of components will be performed in accordance with CEP-NDE-3000. Evaluation of conditions detected by visual examinations during the preservice or inservice inspection of components and component supports will be performed in accordance with the applicable visual examination procedure.

Evaluation of indications detected during the augmented examination of components and component supports will be performed in accordance with this section and the applicable document that governs each augmented examination.

9.1 Successive Inspections

9.1.1 Successive Inspections on Class 1 components will be performed in accordance with IWB-2420 which includes the following criteria in IWB-2420(b), (c) and (e):

(b) If a component is accepted for continued service in accordance with IWB-3132.3 or IWB-3142.4, the areas containing flaws or relevant conditions shall be reexamined during the next three inspection periods listed in the schedule of the inspection program of IWB-2400. Alternatively, acoustic emission may be used to monitor growth of existing flaws in accordance with IWA-2234.

(c) If the reexaminations required by IWB-2420(b) reveal that the flaws or relevant conditions remain essentially unchanged for three successive inspection periods, the component examination schedule may revert to the original schedule of successive inspections.

(e) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of Table IWB-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation by Entergy.

9.1.2 Successive Inspections on Class 2 components will be performed in accordance with IWC-2420 which includes the following criteria in IWC-2420(b), (c) and (d):

(b) If a component is accepted for continued service in accordance with IWC-3122.3 or IWC-3132.3, the areas containing flaws or relevant conditions shall be reexamined during the next inspection period listed in the schedule of the inspection program of IWC-2400. Alternatively, acoustic emission may be used to monitor growth of existing flaws in accordance with IWA-2234.

(c) If the reexaminations required by IWC-2420(b) reveal that the flaws or relevant conditions remain essentially unchanged for the next inspection period, the component examination schedule may revert to the original schedule of successive inspections.

(d) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of Table IWC-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation by Entergy.

9.1.3 As an alternative to 9.1.1 and 9.1.2 for Class 1 and 2 vessels, the requirements of Code Case N-526 may be used to eliminate successive examinations. The requirements of Code Case N-526 are outlined below.

(a) The flaw is characterized as subsurface in accordance with Figure 1 of Code Case N-526.

(b) The NDE technique and evaluation that detected and characterized the flaw, with respect to both sizing and location, shall be documented in the flaw evaluation report.

(c) The vessel containing the flaw is acceptable for continued service in accordance with IWB-3600, and the flaw is demonstrated acceptable for the intended service life of the vessel.

9.1.4 Successive Inspections on Class 3 components will be performed in accordance with IWD-2420 which includes the following criteria in IWD-2420(b), (c) and (d):

(b) If components are accepted for continued service by evaluation in accordance with IWD-3000, the areas containing flaws or relevant conditions shall be reexamined during the next inspection period listed in the schedule of the inspection program of IWD-2400.

(c) If the reexaminations required by IWD-2420(b) reveal that the flaws or relevant conditions remain essentially unchanged for the next inspection period, the component examination schedule may revert to the original schedule of successive inspections.

(d) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of IWD-3000, successive examinations shall be performed, if determined necessary, based on an evaluation by Entergy.

9.1.5 Successive Inspections on Class 1, 2 and 3 component supports will be performed in accordance with IWF-2420 which includes the following criteria in IWF-2420(b) and (c):

(b) When a component support is accepted for continued service in accordance with IWF-3112.2 or IWF-3122.2, the component support shall be reexamined during the next inspection period listed in the schedules of the inspection programs of IWF-2410

(c) When the examinations required by IWF-2420(b) do not require additional corrective measures during the next period, the inspection schedule may revert to the requirements of IWF-2420(a).

9.1.6 Successive Inspections on Augmented examinations will be performed in accordance with its' Augmented Program requirements document.

9.1.7 Plant specific successive inspections are identified in the IDDEAL® database ScheduleWorks® module for each plant and are discussed in Section 3.6.

9.2 Additional Examinations

9.2.1 Additional examinations of Examination Category R-A welds shall be determined in accordance with 9.2.7. The additional examinations will include HSS elements up to a number equivalent to the number of elements required to be inspected during the current outage. If unacceptable flaws or relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined during the current outage.

9.2.2 All other Section XI additional examinations shall be determined in accordance with 9.2.3, 9.2.4, 9.2.5, 9.2.6 as applicable, or 9.2.7 may be used as an alternative. Additional examinations for augmented components and component supports will be performed in accordance the applicable document that governs each augmented examination.

9.2.3 Additional examinations on Class 1 components will be performed in accordance with IWB-2430 which includes the following criteria in IWB-2430(a), (b) and (c):

(a)Examinations performed in accordance with Table IWB-2500-1, except for Examination Category B-P, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1 shall be extended to include additional examinations during the current outage. The additional examinations shall include an additional number of welds, areas, or parts[1] included in the inspection item[2] equal to the number of welds, areas, or parts included in the inspection item that were scheduled to be performed during the present inspection period. The additional examinations shall be selected from welds, areas, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If additional examinations required by IWB-2430(a) reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1, the examinations shall be further extended to include additional examinations during the current outage. These additional examinations shall include the

remaining number of welds, areas, or parts of similar material and service subject to the same type of flaws or relevant conditions.

(c) For the inspection period following the period in which the examinations of IWB-2430(a) or (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWB-2400.

[1] Welds, areas or parts are those described or intended in a particular inspection item of Table IWB-2500-1.

[2] An inspection item, as listed in Table IWB-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule (IWA-2420).

9.2.4 Additional examinations on Class 2 components will be performed in accordance with IWC-2430 which includes the following criteria in IWC-2430(a), (b) and (c):

a) Examinations performed in accordance with Table IWC-2500-1, except for Examination Category C-H, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWC-3410-1 shall be extended to include additional examinations during the current outage. The additional examinations shall include an additional number of welds, areas, or parts[1] included in the inspection item[2] equal to 20% of the number of welds, areas, or parts included in the inspection item that were scheduled to be performed during the interval. The additional examinations shall be selected from welds, areas, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If additional examinations required by IWC-2430(a) reveal flaws or relevant conditions exceeding the acceptance standards of Table IWC-3410-1, the examinations shall be further extended to include additional examinations during the current outage. These additional examinations shall include the remaining number of welds, areas, or parts of similar material and service subject to the same type of flaws or relevant conditions.

(c) For the inspection period following the period in which the examinations of IWC-2430(a) or (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWC-2400

[1] Welds, areas or parts are those described or intended in a particular inspection item of Table IWC-2500-1.

[2] An inspection item, as listed in Table IWC-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule (IWA-2420).

9.2.5 Additional examinations on Class 3 components will be performed in accordance with IWD-2430 which includes the following criteria in IWD-2430(a), (b) and (c):

(a) Examinations performed in accordance with Table IWD-2500-1, except for Examination Category D-B, that reveal flaws or relevant conditions exceeding the acceptance standards of IWD-3000 shall be extended to include additional examinations during the current outage. The additional examinations shall include an additional number of welds, areas, or parts[1] included in the inspection item[2] equal to 20% of the number of welds, areas, or parts included in the inspection item that were scheduled to be performed during the interval. The additional examinations shall be selected from welds, areas, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If additional examinations required by IWD-2430(a) reveal flaws or relevant conditions exceeding the acceptance standards of IWD-3000, the examinations shall be further extended to include additional examinations during the current outage. The extent of the additional examinations shall be determined by Entergy based upon an engineering evaluation of the root cause of the flaws or relevant conditions. Entergy's corrective actions shall be documented in accordance with IWA-6000.

(c) For the inspection period following the period in which the examinations of IWD-2430(a) or (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWD-2400

[1] Welds, areas or parts are those described or intended in a particular inspection item of Table IWD-2500-1.

[2] An inspection item, as listed in Table IWD-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule (IWA-2420).

9.2.6 Additional examinations on Class 1, 2 and 3 component supports will be performed in accordance with IWF-2430 which includes the following criteria in IWF-2430(a), (b), (c) and (d):

(a) Component support examinations performed in accordance with Table IWF-2500-1 that reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400 shall be extended to include the component supports immediately adjacent to those component supports for which corrective action is required. The additional examinations shall be extended to include additional supports within the system, equal in number and of the same type and function as those scheduled for examination during the inspection period.

(b) When the additional examinations required by IWF-2430(a) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, the

examinations shall be further extended to include additional examinations during the current outage. These additional examinations shall include the remaining component supports within the system of the same type and function.

(c) When the additional examinations required by IWF-2430(b) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, the examinations shall be extended to include all nonexempt supports potentially subject to the same failure modes that required corrective actions in accordance with IWF-2430(a) and (b). Also, these additional examinations shall include nonexempt component supports in other systems when the support failures requiring corrective actions indicate non-system-related support failure modes.

(d) When the additional examinations required by IWF-2430(c) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, Entergy shall examine those exempt component supports that could be affected by the same observed failure modes and could affect nonexempt components.

9.2.7 The following criteria of Code Case N-586-1 may be applied for the performance of additional examinations on Class 1, 2 or 3 components or component supports.

(a) An engineering evaluation shall be performed. Topics to be addressed in the engineering evaluation shall include:

1) A determination of the root cause of the flaws or relevant conditions.

2) An evaluation of applicable service conditions and degradation mechanisms to establish the affected welds, areas, or supports will perform their intended safety functions during subsequent operation.

3) A determination of which additional welds, areas, or supports could be subject to the same root cause conditions and degradation mechanisms. This may require the inclusion of piping systems other than the one containing the original flaws or relevant conditions.

(b) Additional examinations shall be performed on those welds, areas, or supports subject to the same root cause conditions and degradation mechanisms. No additional examinations are required if the engineering evaluation concludes that either:

1) There are no additional welds, areas, or supports subject to the same root cause conditions, or

2) No degradation mechanism exists.

(c) Any required additional examinations shall be performed during the current outage.

(d) The engineering evaluation shall be retained in accordance with IWA-6000.

9.2.8 Plant specific additional examinations are identified in the IDDEAL® database ScheduleWorks® module.

10.0 Risk-Informed ISI Program

ANO-2 has submitted a request for alternative to use the Risk-Informed ISI (RI-ISI) very similar to that contained in ASME Code Case N-716. Otherwise known as the Risk-Informed / Safety-Based ISI Process. The request and any NRC correspondence is contained in Table 3.0-1.

10.1 RISK-INFORMED / SAFETY-BASED ISI PROCESS

The process used to develop the RIS_B Program conformed to the methodology described in Code Case N-716 and consisted of the following steps:

- Safety Significance Determination
- Failure Potential Assessment
- Element and NDE Selection
- Risk Impact Assessment
- Implementation Program
- Feedback Loop

10.1.1 Safety Significance Determination

The systems assessed in the RIS_B Program are provided in Table 3.1 of each plants template submittal. The piping and instrumentation diagrams and additional plant information including the existing plant ISI Program were used to define the piping system boundaries.

Per Code Case N-716 requirements, piping welds are assigned safety-significance categories, which are used to determine the treatment requirements. High safety-significant (HSS) welds are determined in accordance with the requirements below. Low safety-significant (LSS) welds include all other Class 2, 3, or Non-Class welds.

(1) Class 1 portions of the reactor coolant pressure boundary (RCPB), except as provided in 10 CFR 50.55a(c)(2)(i) and (c)(2)(ii);

(2) Applicable portions of the shutdown cooling pressure boundary function. That is, Class 1 and 2 welds of systems or portions of systems needed to utilize the normal shutdown cooling flow path either:

(a) As part of the RCPB from the reactor pressure vessel (RPV) to the second isolation valve (i.e., farthest from the RPV) capable of remote closure or to the containment penetration, whichever encompasses the larger number of welds; or

(b) Other systems or portions of systems from the RPV to the second isolation valve (i.e., farthest from the RPV) capable of remote closure or to

the containment penetration, whichever encompasses the larger number of welds;

(3) That portion of the Class 2 feedwater system [> 4 inch nominal pipe size (NPS)] of pressurized water reactors (PWRs) from the steam generator to the outer containment isolation valve;

(4) Piping within the break exclusion region (> NPS 4) for high-energy piping systems as defined by the Owner. This may include Class 3 or Non-Class piping; and

(5) Any piping segment whose contribution to Core Damage Frequency (CDF) is greater than 1E-06 (or 1E-07 for Large early event frequency (LERF)) based upon a plant-specific PSA of pressure boundary failures (e.g., pipe whip, jet impingement, spray, inventory losses). This may include Class 3 or Non-Class piping.

10.1.2 Failure Potential Assessment

Failure potential estimates were generated utilizing industry failure history, plant-specific failure history, and other relevant information. These failure estimates were determined using the guidance provided in EPRI TR-112657 (i.e., the EPRI RI-ISI methodology), with the exception of the deviation discussed below.

As described in section 2.3.3 above, CC N-716 augments the generic HSS welds with a search for plant-specific HSS welds based on the flooding analysis. The flooding analysis identifies areas that may be sensitive to floods (i.e., potential HSS areas) and then evaluates the failure potential of piping segments in areas that are sensitive to flooding. The failure frequencies used in the Entergy flooding studies were not based on Entergy plant specific data as there had not been significant flooding experience at Entergy. As such, failure frequencies were obtained from various industry reports as defined in each plants template submittal.

A deviation to the EPRI RI-ISI methodology has been implemented in the failure potential assessment for each site. Table 3-16 of EPRI TR-112657 contains criteria for assessing the potential for thermal stratification, cycling, and striping (TASCS). These additional considerations for determining the potential for thermal fatigue as a result of the effects of TASCS provide an allowance for considering cycle severity. The above criteria have previously been submitted by EPRI to the NRC for generic approval [letters dated February 28, 2001 and March 28, 2001, from P.J. O'Regan (EPRI) to Dr. B. Sheron (USNRC), *Extension of Risk-Informed Inservice Inspection Methodology*]. The methodology used in the Entergy RIS_B applications for assessing TASCS potential conforms to these updated criteria. Final materials reliability program (MRP) guidance on the subject of TASCS will be incorporated into the RIS_B applications, if warranted.

10.1.3 Element and NDE Selection

Code Case N-716 provides criteria for identifying the number and location of required examinations. Ten percent of the HSS welds shall be selected for examination as follows:

(1) Examinations shall be prorated equally among systems to the extent practical, and each system shall individually meet the following requirements:

  (a) A minimum of 25% of the population identified as susceptible to each degradation mechanism and degradation mechanism combination shall be selected.

  (b) If the examinations selected above exceed 10% of the total number of HSS welds, the examinations may be reduced by prorating among each degradation mechanism and degradation mechanism combination, to the extent practical, such that at least 10% of the HSS population is inspected.

  (c) If the examinations selected above are not at least 10% of the HSS weld population, additional welds shall be selected so that the total number selected for examination is at least 10%.

(2) At least 10% of the RCPB welds shall be selected.

(3) For the RCPB, at least two-thirds of the examinations shall be located between the first isolation valve (i.e., isolation valve closest to the RPV) and the RPV.

(4) A minimum of 10% of the welds in that portion of the RCPB that lies outside containment (e.g., portions of the main feedwater system in BWRs) shall be selected.

(5) A minimum of 10% of the welds within the break exclusion region (BER) shall be selected.

In contrast to a number of RI-ISI Program applications where the percentage of Class 1 piping locations selected for examination has fallen substantially below 10%, Code Case N-716 mandates that 10% be chosen. Section 4 of EPRI TR-112657 was used as guidance in determining the examination requirements for these locations.

10.1.4 Risk Impact Assessment

The RIS_B Program has been conducted in accordance with Regulatory Guide 1.174 and the requirements of Code Case N-716, and the risk from implementation of this program is expected to remain neutral or decrease when compared to that estimated from current requirements.

This evaluation categorized segments as high safety significant or low safety significant in accordance with Code Case N-716, and then determined what inspection changes are proposed for each system. The changes include changing the number and location of inspections and in many cases improving the effectiveness of the inspection to account for the findings of the RIS_B degradation mechanism assessment. For example, examinations of locations subject to thermal fatigue will be

conducted on an expanded volume and will be focused to enhance the probability of detection (POD) during the inspection process.

10.1.5 Quantitative Analysis

Code Case N-716 has adopted the EPRI TR-112657 process for risk impact analyses whereby limits are imposed to ensure that the change in risk of implementing the RIS_B Program meets the requirements of Regulatory Guides 1.174 and 1.178. The EPRI criterion requires that the cumulative change in CDF and LERF be less than 1E-07 and 1E-08 per year per system, respectively.

Entergy has conducted a risk impact analysis per the requirements of Section 5 of Code Case N-716 that is consistent with the "Simplified Risk Quantification Method" described in Section 3.7 of EPRI TR-112657. The analysis estimates the net change in risk due to the positive and negative influences of adding and removing locations from the inspection program.

The conditional core damage probability (CCDP) and conditional large early release probability (CLERP) values used to assess risk impact were estimated based on pipe break location. Based on these estimated values, a corresponding consequence rank was assigned per the requirements of EPRI TR-112657 and upper bound threshold values were used as provided below. Consistent with the EPRI risk-informed methodology, the upper bound for all break locations that fall within the high consequence rank range was based on the highest CCDP value obtained (i.e., Large LOCA for W3).

The likelihood of pressure boundary failure (PBF) is determined by the presence of different degradation mechanisms and the rank is based on the relative failure probability. The basic likelihood of PBF for a piping location with no degradation mechanism present is given as x_o and is expected to have a value less than 1E-08. Piping locations identified as medium failure potential have a likelihood of $20x_o$. These PBF likelihoods are consistent with References 9 and 14 of EPRI TR-112657. In addition, the analysis was performed both with and without taking credit for enhanced inspection effectiveness due to an increased POD from application of the RIS_B approach.

Table 3.4-1 of the ANO 2 template submittal presents a summary of the RIS_B Program versus 2001 Edition through the 2003 Addenda of ASME Section XI program requirements on a "per system" basis. The presence of FAC was adjusted for in the quantitative analysis by excluding its impact on the failure potential rank. The exclusion of the impact of FAC on the failure potential rank and therefore in the determination of the change in risk is performed, because FAC is a damage mechanism managed by a separate, independent plant augmented inspection program. The RIS_B Program credits and relies upon this plant augmented inspection program to manage this damage mechanism. The plant FAC Program will continue to determine where and when examinations shall be performed. Hence, since the

number of FAC examination locations remains the same “before” and “after” and no delta exist, there is no need to include the impact of FAC in the performance of the risk impact analysis.

10.1.6 Implementation and Monitoring Program

Upon approval of the RIS_B Program, procedures that comply with the guidelines described in EPRI TR-112657 will be prepared to implement and monitor the program. The applicable aspects of the ASME Code not affected by this change will be retained, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements. Existing ASME Section XI program implementing procedures will be retained and modified to address the RIS_B process, as appropriate.

The monitoring and corrective action program will contain the following elements:

A. Identify

B. Characterize

C. Evaluate,

(1) Determine the cause and extent of the condition identified

(2) Develop a corrective action plan or plans

D. Decide

E. Implement

F. Monitor

G. Trend

The RIS_B Program is a living program requiring feedback of new relevant information to ensure the appropriate identification of HSS piping locations. As a minimum, this review will be conducted on an ASME period basis. In addition, significant changes may require more frequent adjustment as directed by NRC Bulletin or Generic Letter requirements, or by industry and plant-specific feedback.