Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802
Tel 479-858-4619

Dale E. James
Manager, Licensing
Nuclear Safety Assurance
Arkansas Nuclear One

1CAN050807

May 30, 2008

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

SUBJECT: Inservice Inspection Plan for the Fourth 10-Year Interval
Arkansas Nuclear One, Unit 1
Docket No. 50-313
License No. DPR-51

REFERENCE: Entergy Letter dated May 20, 2008, "Relief Requests for Third 120 Month Inservice Testing Interval" (CNRO-2008-00016)

Dear Sir or Madam:

As required by paragraph IWA-1400(c) of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, attached is the approved Inservice Inspection (ISI) Plan for the fourth 10-year interval at Arkansas Nuclear One, Unit 1 (ANO-1). This interval commences on June 1, 2008, and concludes on May 31, 2017. The plan is attached.

Entergy is providing this plan for information only. Entergy is not requesting NRC approval of the plan. The plan includes no new commitments.

The reference submittal transmitted the relief requests for ANO-1's fourth 10-year ISI interval. As noted in that submittal, most of the relief requests are similar to the relief requests approved for use in the current interval.

If you have any questions or require additional information, please contact me.

Sincerely,

DEJ/rwc

Attachment: ANO-1 Inservice Inspection Plan for the Fourth 10-Year Interval

cc: Mr. Elmo E. Collins
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Arkansas Nuclear One
P. O. Box 310
London, AR 72847

U. S. Nuclear Regulatory Commission
Attn: Mr. Alan B. Wang
MS O-7 D1
Washington, DC 20555-0001

Mr. Bernard R. Bevill
Director Division of Radiation
Control and Emergency Management
Arkansas Department of Health & Human Services
P.O. Box 1437
Slot H-30
Little Rock, AR 72203-1437

Attachment to

1CAN050807

ANO-1 Inservice Inspection Plan for the Fourth 10-Year Interval

TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Implementation of an Inservice Inspection Program in accordance with the requirements of ASME Section XI, Division 1, is mandated by the United States Code of Federal Regulations, Title 10, Part 50, Section 55a (10 CFR 50.55a).

This Program Section contains the details of the ASME Section XI, Division 1, Inservice Inspection (ISI) Program for Arkansas Nuclear One Unit 1 (ANO-1).

ANO-1 is currently in the fourth 120-month Inservice Inspection Interval. The coordination of refueling outages and periods within the current Inservice Inspection interval is shown in Figure 2.5-1.

The scope of this program section includes the inspection of Class 1, 2, and 3 pressure retaining components and their supports. This program section also includes augmented inservice examinations that require NDE inspections and are maintained and implemented by the ISI Program. Other augmented examinations are maintained and implemented in independent programs due to their complexity, subject matter, or because the examinations are not related to the ISI Program.

Changes to the contents of this Program Section shall be performed in accordance with Nuclear Management Manual Procedure DC-174.

This ISI plan is controlled by 10 CFR 50.55a. The original and any changes that meet 10 CFR 50.55a do not require a Process Applicability Determination.

This program section does not include System Pressure Testing of Class 1, 2, and 3 pressure retaining components. These requirements are contained in CEP-PT-001.

This program section does not include the requirements for the examination and testing of ASME Class CC and MC components and component supports. These requirements are contained in Program Section CEP-CISI-101.

The requirements for the repair and replacement of Class 1, 2, and 3 pressure retaining components and supports and ASME Class CC and MC components and component supports are contained in Program Section CEP-R&R-001.

Snubbers (pin-to-pin portion) will be examined and tested in accordance with plant Snubber program. Snubber support hardware such as lugs, bolting, pins and clamps between the snubber pins and component (or the snubber pin and the building structure) will be examined in accordance with Section XI, Subsection IWF, per this program section.

1.2 Background – Arkansas Nuclear One Unit 1 (ANO-1)

The ANO-1 nuclear steam supply system is a Babcock & Wilcox (B&W) two loop Pressurized Water Reactor (PWR) design. Entergy obtained a Construction Permit to build ANO-1 on December 6, 1968. After satisfactory plant construction and pre-operational testing was completed, Entergy was granted a full power operating license, DPR-51, on May 21, 1974, and subsequently commenced commercial operation on December 19, 1974. The NRC Docket Number assigned to ANO-1 is 050-00313.

The initial 120-month ISI Program commenced with commercial operation on December 19, 1974. The second ten year interval which began on December 19, 1984 was, with authorization from the Director of the Office of Nuclear Regulation (Reference GNRI 96-00244) extended until June 1, 1997. The third 120-month interval began on June 1, 1997 and was due to end on May 31, 2007, but was extended 12 months to May 31, 2008, as allowed by ASME Section XI, IWA-2430(d)(1), with the exception of the reactor vessel welds (Examination Category B-A) reactor vessel nozzle inner radius sections (Examination Category B-D), reactor vessel inlet and outlet nozzle-to-piping welds (Examination Category B-J), reactor core flood lines nozzle-to-safe end welds (Examination Category B-F), reactor vessel interior (Examination Category B-N-1), reactor vessel interior attachments (Examination Category B-N-2) and reactor vessel core support structure (Examination Category B-N-3). The third 120-month interval for these components was extended to the fall 2008 refueling outage as authorized by NRC Safety Evaluations in references 1CNA010704, 1CNA120601, and 1CNA020701. In addition, extension of the third 120-month interval for Category C-F-1 and C-F-2 piping welds was requested by Entergy per Request for Alternative ANO1-ISI-008 (reference CNRO-2007-00009).

2.0 BASIS FOR INSERVICE INSPECTION PROGRAM PLAN

The following text provides a listing and overview of the documents (Code of Federal Regulations, ASME Boiler and Pressure Vessel Codes, and Entergy documents) that form the basis of the ISI Program Plan. Specific implementation of the requirements in these documents is included in Section 3 of this Program Plan.

2.1 Code of Federal Regulations Requirements

Code of Federal Regulations Final Rules that affect the ISI Program Update for ANO-1 include the 10 CFR 50.55a Final Rule published September 29, 2005 (70 FR 188). 70 FR 188 incorporated by reference ASME Section XI, 2001 Edition with 2003 Addenda in paragraph (b)(2). 70 FR 188 also removed the mandatory modification in 10 CFR 50.55a(b)(2)(xxi)(C) and was effective October 31, 2005. Twenty-seven (27) limitations and modifications are included in 10 CFR 50.55a(b)(2) and are numbered (i) to (xxvii). In addition, one (1) limitation and modification is included in 10 CFR 50.55a(b)(3)(v) and in 10 CFR 50.55a(g)(4)(iii). Each of these limitations and modifications was reviewed by Entergy personnel and implemented as discussed in Section 3.1.1.

2.1.1 Plant Classification

Per 10 CFR 50.55a(g)(4), the specific components required to be included in an ISI Program per ASME Section XI are those components and component supports which are classified as ASME Code Class 1, 2, and 3. ASME Code Class is also discussed in IWA-1320, "Classifications."

Components subject to Section XI requirements are shown on the Inservice Inspection Boundary Drawings discussed in Section 3.8. Pursuant to 10 CFR 50.55a, the ISI requirements of ASME Section XI have been assigned to these components within the constraints of existing plant design.

In order to avoid confusion between ASME Code Class for design (typically ASME Section III) and ASME Code Class for inservice inspection (ASME Section XI), Entergy is utilizing ISI Class 1, 2, and 3 terminology for the application of ASME Section XI ISI requirements.

Components considered to be optionally classified as ASME Code Class may be excluded from the Section XI ISI Program per IWA-1320(e).

Determination of the ASME Code Class (or equivalent to ASME Code Class for components not designed in accordance with ASME Section III requirements) for ANO-1 was performed as follows.

The ASME Code Class of components was established in accordance with standards for those structures, systems and components important to safety and is presented in Appendix A of the Safety Analysis Report (SAR) (see Sections A.2, "Codes and Industrial Standards", and A.3, "Classification of Piping and Equipment"). B31.7, components designed as Nuclear Class I were considered ASME Class 1, B31.1 components designed as Nuclear Class II were considered ASME Class 2, and components designed as Nuclear Class III were considered ASME Class 3. In addition, components designed as Non-Nuclear Power which are included in systems performing safety related functions were treated as ASME Class 2 or ASME Class 3 for ASME Section XI purposes. These components have been classified as ANSI B31.1, Class T2 (treated as ISI Class 2) and ANSI B31.1, Class T3 (treated as ISI Class 3) for inservice inspection, respectively.

2.1.2 ASME Section XI Code of Record

In accordance with 10 CFR 50.55a(g), Entergy is required to update the ASME Section XI (the Code) ISI Program for ANO-1 once every ten years. The updated ISI Program is required to comply with the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a one year prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii).

The interval dates for ANO-1 are discussed in Section 1.2 of this document. Accordingly, based on "lock in" dates of May 31, 2007, the 2001 Edition with the 2003 Addenda of ASME Section XI is the version of Section XI that Entergy must meet for the current intervals at these plants.

Note that based on 10 CFR 50.55a(b)(2) requirements, the 1989 Edition of Section XI is being implemented for IWB-1220; the 1995 Edition with 1997 Addenda of Section XI is being implemented for IWA-2240; the 1998 Edition with 2000 Addenda of Section XI is being implemented for Examination Category B-D, Item Nos. B3.120 and B3.140; and the 2001 Edition of Section XI is being implemented for Appendix VIII and supplements to Appendix VIII and Article I-3000. See Section 3.1.1 for further details.

2.1.3 ASME Section XI Code Cases

Per 10 CFR 50.55a(g), ASME Code Cases that have been determined to be suitable for use in ISI Program Plans by the NRC are listed in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI, Division 1." The use of Code Cases (other than those listed in Regulatory Guide 1.147) may be authorized by the Director of the Office of Nuclear Reactor Regulation upon request pursuant to 10 CFR 50.55a(a)(3). The ASME Section XI Code Cases incorporated into the ISI Program Plan are controlled per section 3.1.2.

2.1.4 Requests For Relief and Requests For Alternatives

In cases where Entergy has determined that ASME Section XI requirements are impractical to implement or has determined that an alternative inspection approach to that specified in ASME Section XI is applicable, a 10 CFR 50.55a Request has been prepared and submitted to the NRC in accordance with 10 CFR 50.55a(a)(3)(i), 10 CFR 50.55a(a)(3)(ii) or 10 CFR 50.55a(g)(5), as applicable.

In cases where Entergy proposes alternatives to the ASME Section XI requirements that would provide an acceptable level of quality and safety, a Request for Alternative, as allowed by 10 CFR 50.55a(a)(3)(i) will be submitted to the NRC.

In cases where Entergy proposes alternatives to ASME Section XI when compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, a Request for Alternative as allowed by 10 CFR 50.55a(a)(3)(ii), will be submitted to the NRC.

Per 10 CFR 50.55a paragraph (a)(3) Requests for Alternatives "…may be used when authorized by the Director of the Office of Nuclear Reactor Regulation."

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)(iii). The submittal of this information will be referred to as a Request for Relief.

Per 10 CFR 50.55a paragraph (g)(6)(i), the Director of the Office of Nuclear Reactor Regulation will evaluate Requests for Relief per Paragraph (g)(5) and "…may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility."

Requests for Relief and Requests for Alternatives for the current interval at each plant are included in Section 3.4.

2.2 Augmented ISI Requirements

Augmented inservice inspection programs include examinations and tests that are in addition to those required by ASME Section XI.

2.2.1 Augmented Examination Types

Augmented inspection requirements fall into two broad groups or types:

Examinations on components that are not normally subject to ISI per ASME Section XI (e.g., Reactor Coolant Pump Flywheel examination).

Supplemental examination requirements for components that are already subject to examination in accordance with ASME Section XI, but for which a non-ASME Section XI requirement such as examination volume, frequency, selection criteria or test method is mandated, recommended or desired.

Augmented inspection requirements may be in response to regulatory requirements, recommendations or requirements from Industry groups, or Entergy internal commitments.

2.3 Risk-Informed ISI

2.3.1 Risk-Informed ISI Program Plan

ANO-1 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 are contained in Section 3.4.

2.3.2 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

2.3.3 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 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 Release Frequency (LERF)) based upon a plant-specific probabilistic safety assessment (PSA) of pressure boundary failures (e.g., pipe whip, jet impingement, spray, inventory losses). This may include Class 3 or Non-Class piping.

2.3.4 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.

2.3.5 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 Boiling Water Reactors (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.

2.3.6 Additional Examinations

The RIS-B Program in all cases will determine through an engineering evaluation the root cause of any unacceptable flaw or relevant condition found during examination. The evaluation will include the applicable service conditions and degradation mechanisms to establish that the element(s) will still perform their intended safety function during subsequent operation. Elements not meeting this requirement will be repaired or replaced.

The evaluation will include whether other elements in the segment or additional segments are subject to the same root cause conditions. Additional examinations will be performed on those elements with the same root cause conditions or degradation mechanisms. 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. No additional examinations need be performed if there are no additional elements identified as being susceptible to the same root cause conditions.

2.3.7 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.

2.3.8 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 loss-of-coolant-accident (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 each template submittal presents a summary of the RIS-B Program versus 1992 ASME Section XI Code Edition program requirements on a "per system" basis. The presence of flow accelerated corrosion (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.

2.3.9 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. (1) Evaluate, determine the cause and extent of the condition identified
   (2) Evaluate, 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.

2.4 Methods of Examination and Personnel Qualification

The three types of examination methods employed for Inservice Inspection are visual, surface and volumetric. Each of these types describes a general technique which, in some cases, permits a selection of different methods within that type. The methods allow the Owner to select the most effective examination methodology based on factors such as component accessibility, radiation levels and component material of construction.

Administration and control of Section XI examinations and personnel qualification requirements are included in CEP-NDE-100, “Administration and Control of ENS NDE.”

2.5 Inspection Intervals and Inspection Scheduling

2.5.1 Inspection Intervals

Per IWA-2430 of ASME Section XI, the inservice examinations required by IWB, IWC, and IWD, and the examinations and tests of IWF shall be completed during each of the inspection intervals for the service lifetime of the power unit. Because the Code of Federal Regulations, 10 CFR 50.55a(g)(4)(ii) specifies 120 month inspection intervals for inservice inspections, Inspection Program B must be employed.

Per IWA-2430(d), for components inspected under Program B, each of the inspection intervals may be extended or decreased by as much as one year. Adjustments shall not cause successive intervals to be altered by more than one year from the original pattern of intervals.

Inspection Interval timelines for ANO-1 are shown in Figure 2.5-1. Note that the Interval end dates for the unit is pulled back to shorten the interval, as allowed by IWA-2430(d). This is being done to regain the allowable one year extension for future intervals.

Augmented examinations will align with the ASME Section XI interval unless stated otherwise in the document that governs the specific criteria for the examinations.

Examinations shall be scheduled and performed in accordance with this section and the applicable document that governs each augmented examination. Details of the augmented examinations are addressed in Appendix B.

There may be instances when augmented examinations and ASME Section XI examinations coincide for the same component. Examinations should be performed concurrently to optimize examination resources to the extent practical.

2.5.2 Inspection Schedule

Per IWB-2410, inservice examinations of Class 1 components may be performed during plant outages such as refueling shutdowns or maintenance shutdowns. Per IWC-2410, IWD-2410, and IWF-2410, inservice examinations of Class 2, Class 3 and Class 1, 2, and 3 component supports, respectively may be performed during either system operation or plant outages.

Table 2.5-1 provides the minimum and maximum percentages of examinations required to be completed by each inspection period. The following examinations listed in IWB-2412(a)(1) to (5), are not required to meet the criteria in Tables 2.5-1.

(1) Examination Categories B-N-1, B-P, and B-Q

(2) Examinations partially deferred to the end of the inspection interval, as allowed by Examination Categories B-A, B-D, B-F.

(3) Examinations deferred to the end of the inspection interval, as allowed by Examination Categories B-A, B-L-1, B-M-1, B-N-2, B-N-3, and B-O.

(4) Examinations deferred until disassembly of a component for maintenance, repair/replacement activity, or volumetric examination as allowed by Examination Categories B-G-1, B-G-2, B-L-2, and B-M-2,

(5) Welded attachments examined as a result of component support deformation under Examination Category B-K.

In the event that an Examination Category includes less than three components or items, the components or items may be examined in any two periods; or if in any one period if there is only one item or component in lieu of the requirements of Table 2.5-1.

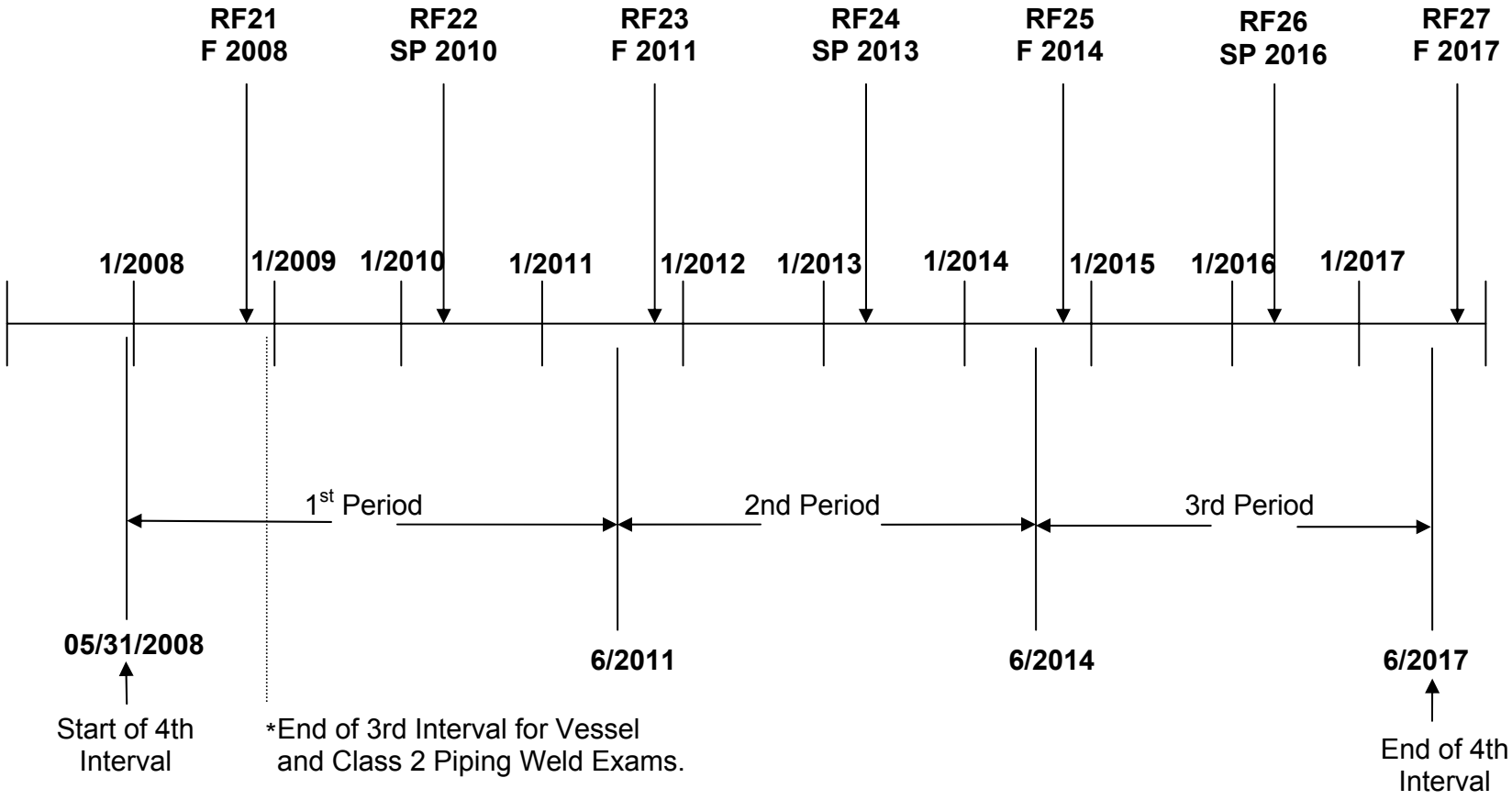
TABLE 2.5-1
ANO-1 COMPONENT/COMPONENT SUPPORT SCHEDULING

INSPECTION INTERVAL	INSPECTION PERIOD (CALENDAR YEARS OF PLANT SERVICE WITHIN THE INTERVAL)	MINIMUM EXAMINATIONS COMPLETED, %	MAXIMUM EXAMINATIONS COMPLETED, %
4th	3	16	50
4th	3[2]	50[1]	75
4th	3	100	100

[1] If the first period completion percentage for any examination category exceeds 34%, at least 16% of the required examinations shall be performed in the second period.

[2] The second period is reduced by one calendar year to regain the one year extension used in the third interval.

Figure 2.5-1: ANO-1 4th Interval Schedule



*See Requests for Alternatives
ANO-ISI-005
ANO-ISI-006
ANO-ISI-007
ANO-ISI-008

2.6 Component and Component Support Selection Criteria

Class 1, 2, and 3 components and component supports were selected for examination per the requirements of the 2001 Edition with the 2003 Addenda of Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, and IWF-2500-1, respectively. IWB-2420(a), IWC-2420(a), IWD-2420(a) and IWF-2420(a), state that the sequence of component and component support examinations established during the first interval shall be repeated during the successive intervals to the extent practical. Entergy is also adopting the alternative criteria of Code Case N-624, which states that the sequence of examinations may be modified provided the percentage of requirements of Tables IWB-2412-1, IWC-2412-1, IWD-2412-1 and IWF-2410-2 are met. This alternative criterion allows the sequence of examinations established during the first interval to be modified by factors such as scaffolding erection, radiological concerns, insulation removal or other considerations.

2.6.1 Selection of ISI Class 1 Pumps for Internal Surface Exams

The VT-3 examination of ISI Class 1 pump casing internal surfaces in accordance with Table IWB-2500-1, Examination Category B-L-2 is subject to the following criteria per Notes (1) and (2) of that table:

(1) Examinations are limited to at least one pump in each group of pumps performing similar functions in the system, e.g. recirculating coolant pumps.

(2) Examination is required only when the pump is disassembled for maintenance, repair or volumetric examination. Examination of the internal pressure boundary shall include the internal pressure retaining surfaces made accessible for examination by disassembly. If a partial examination is performed and a subsequent disassembly of that pump allows a more extensive examination, an examination shall be performed during the subsequent disassembly. A complete examination of one pump in each group is required only once during the interval.

ISI Class 1 pumps subject to examination at ANO-1 are identified in the ScheduleWorks® Module of IDDEAL® Software.

2.6.2 Selection of ISI Class 1 Valves for Internal Surface Exams

The VT-3 examination of ISI Class 1 valve internal surfaces in accordance with Table IWB-2500-1, Examination Category B-M-2 is subject to the following criteria per Notes (2) and (3) of that table:

(2) Examination is required only when the valve is disassembled for maintenance, repair or volumetric examination. Examination of the internal pressure boundary shall include the internal pressure retaining surfaces made accessible for examination by disassembly. If a partial examination is performed and a subsequent disassembly of that pump allows a more extensive examination, an examination shall be performed during the subsequent disassembly. A complete examination of one valve in each group is required only once during the interval.

(3) Examinations are limited to at least one valve within each group of valves that are the same size, constructional design, (such as globe, gate, or check valves), and manufacturing method, and that perform similar functions in the system (such as containment isolation and system overpressure protection).

ISI Class 1 valves subject to examination at ANO-1 are identified in ScheduleWorks® Module of IDDEAL® Software. Note that examination of each valve in a "Unique" group of valves is required a maximum of once during the inspection interval.

2.6.3 Selection of ISI Class 1 Valves for Bolting Examinations

The VT-1 examination of ISI Class 1 valve bolting, 2 in. and less in diameter is performed in accordance with Table IWB-2500-1, Examination Category B-G-2, including Note 2:

(2) For vessels, pumps, or valves, examination of bolting is required only when the component is examined under Examination Category B-B, B-L-2, or B-M-2. Examination of bolted connection is required only once during the interval.

ISI Class 1 valves subject to bolting examination at ANO-1 are identified in ScheduleWorks® Module of IDDEAL® Software. Note that examination of each valve in a "Unique" group of valves is required a maximum of once during the inspection interval.

2.6.4 Selection of ISI Class 1 Valves for Body Weld Examinations

The volumetric examination of ISI Class 1 valve body welds is performed in accordance with Table IWB-2500-1, Examination Category B-M-1, Notes (3) and (4):

(3) Examinations are limited to at least one valve within each group, of valves that are the same size, constructional design, (such as globe, gate, or check valves), and manufacturing method, and that perform similar functions in the system (such as containment isolation and system overpressure protection).

(4) Includes essentially 100% of weld length.

ISI Class 1 valves subject to body weld examination at ANO-1 are identified in ScheduleWorks® Module of IDDEAL® Software.

2.7 Examination Evaluation Criteria

Evaluation of reportable indications detected during the inservice inspection of components and component supports will be performed in accordance with Article IWA-3000 of ASME Section XI, 2001 Edition with 2003 Addenda. Specific evaluation requirements for Class 1, 2, and 3 components are included in IWB-3000, IWC-3000, and IWD-3000, respectively. Specific evaluation requirements for Class 1, 2, and 3 component supports are included in IWF-3000. Indications detected may be evaluated by other nondestructive methods, where practical, to assist in the determination of flaw characteristics (e.g. size, shape, location, orientation, etc.) before final disposition is made.

Evaluation of reportable 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.

2.7.1 Successive Inspections

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.

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.

As an alternative for ISI Class 1 and ISI Class 2 vessels with subsurface flaws, the criteria of Code Case N-526 may be used.

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.

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 re-examined 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).

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

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

2.7.2 Additional Examinations

Additional examinations of Examination Category R-A welds shall be determined in accordance with 2.7.2.5. 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.

All other Section XI examinations shall be determined in accordance with 2.7.2.5 or 2.7.2.1, 2.7.2.2, 2.7.2.3, 2.7.2.4 as applicable. Additional examinations for augmented components and component supports will be performed in accordance the applicable document that governs each augmented examination.

2.7.2.1 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.

2.7.2.2 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.

2.7.2.3 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.

2.7.2.4 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.

2.7.2.5 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.

Plant specific additional examinations are identified in the IDDEAL® database Scheduleworks® module for each plant and are discussed in Section 3.5.2.

[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).

2.8 Records and Reports

The preparation and retention of records and reports detailing ISI plans and schedules, examinations, tests, replacements, and repairs will be in accordance with Article IWA-6000 of ASME Section XI, 2001 Edition with 2003 Addenda as modified by the alternative requirements of Code Case N-532-4. Form OAR-1 will be prepared, maintained, and submitted in accordance with Program Section CEP-R&R-001.

3.0 INSERVICE INSPECTION PROGRAM PLAN DESCRIPTION

This Inservice Inspection Program Section consists of those examination requirements in ASME Section XI, Subsections IWA, IWB, IWC, IWD, IWF and Mandatory Appendices.

The following text includes a detailed description of the ASME Section XI ISI Program Plan in Section 3.1 which provides a comprehensive summary of the bases for the ISI Program Plan. Sections 3.2, 3.3 and 3.4 include supporting details for Later Editions and Addenda of ASME Section XI, ASME Section XI Code Cases, and Requests For Relief and Requests For Alternatives from ASME Section XI requirements. Sections 3.5 through 3.11 provide additional information that describe and support this ISI Program Plan.

3.1 ASME Section XI Requirements

Based on ASME Section XI Code of Record "lock-in" date of May 31, 2007 for ANO-1 and the 10 CFR 50.55a requirements in effect at that time, this ISI Program Plan was developed in accordance with the requirements of the 2001 Edition with 2003 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Subsections IWA, IWB, IWC, IWD, IWF, Mandatory Appendices, and Inspection Program B of IWA-2432, except as follows.

3.1.1 Code of Federal Regulations Modifications and Limitations

The following mandatory and optional Code of Federal Regulations Limitations and Modifications are included in 10 CFR 50.55a as of September 29, 2005. Only those 10 CFR 50.55a Limitations and Modifications applicable to the 2001 Edition with 2003 Addenda of Section XI nondestructive examination requirements for Class 1, 2, and 3 components and component supports are listed. 10 CFR 50.55a Limitations and Modifications applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in Program Sections CEP-PT-001, CEP-CISI-101 and CEP-R&R-001, respectively. Note that mandatory modification 10 CFR 50.55a(b)(2)(xxi)(C) was removed by the Final Rule dated September 29, 2005 (70FR188), effective on October 31, 2005. These Limitations and Modifications were reviewed for inclusion in the ISI Program Plan and dispositioned as follows:

3.1.1.1 Entergy will not implement the option in 10 CFR 50.55a(b)(2)(i), to utilize ASME Section XI, 1974 Edition with Addenda through Summer 1975 and ASME Section XI, 1977 Edition with Addenda through Summer 1978.

3.1.1.2 Entergy will not utilize the option in 10 CFR 50.55a(b)(2)(ii), to examine Class 1 piping per ASME Section XI, 1974 Edition with the Summer 1975 Addenda.

3.1.1.3 As allowed by 10 CFR 50.55a(b)(2)(iii), steam generator tubing at ANO-1 will be examined in accordance with plant Technical Specifications in lieu of Article IWB-2000.

3.1.1.4 Entergy will not utilize the option in 10 CFR 50.55a(b)(2)(iv), to examine Class 2 piping per ASME Section XI, 1974 Edition with the Summer 1975 Addenda and the 1983 Edition through the Summer 1983 Addenda.

3.1.1.5 As required by 10 CFR 50.55a(b)(2)(x), Entergy will apply the station 10 CFR 50 Appendix B Quality Assurance Program to Section XI activities.

3.1.1.6 As required by 10 CFR 50.55a(b)(2)(xi), Entergy will apply the rules in IWB-1220, "Components Exempt from Examination," of Section XI, 1989 Edition in lieu of the IWB-1220 requirements in Section XI, 2001 Edition with 2003 Addenda.

3.1.1.7 As allowed by 10 CFR 50.55a(b)(2)(xiv), Entergy may use the annual practice requirements in VII-4240 of Section XI Appendix VII in place of the 8 hours of annual hands-on training (when deemed appropriate) as discussed in 10 CFR 50.55a(b)(2)(xiv). When utilizing this option, the annual practice requirements will be performed on material or welds that contain cracks, or by analyzing prerecorded data from material or welds that contain cracks. All training will be completed no earlier than 6 months prior to performing ultrasonic examinations.

3.1.1.8 Entergy will implement the Appendix VIII specimen set and qualification provisions in paragraphs (b)(2)(xv)(A) to (b)(2)(xv)(M) in accordance with 10 CFR 50.55a(b)(2)(xv) with the understanding that the alternative requirements of Code Case N-695 will be utilized in lieu of those in Appendix VIII, Supplement 10, and the alternative requirements of Code Case N-696 will be utilized in lieu of those in Appendix VIII, Supplements 2, 3 and 10 for examinations performed from the inside diameter. Entergy views the requirements in 10 CFR 50.55a(b)(2)(xv) to be mandatory.

3.1.1.9 As required by 10 CFR 50.55a(b)(2)(xvi)(A) and 10 CFR 50.55a(b)(2)(xvi)(B), Entergy examinations performed from one side of a ferritic vessel weld and examinations performed from one side of a ferritic or stainless steel pipe will be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations.

3.1.1.10 As required by 10 CFR 50.55a(b)(2)(xviii)(A), Level I and II nondestructive examination personnel at Entergy will be recertified on a 3-year interval in lieu of the 5-year interval specified in IWA-2314(a) and IWA-2314(b) of the 2001 Edition with 2003.

3.1.1.11 As required by 10 CFR 50.55a(b)(2)(xviii)(B), paragraph IWA-2316 of the 2001 Edition with 2003 Addenda will only be used to qualify personnel that observe for leakage during system leakage and hydrostatic tests conducted in accordance with IWA-5211(a) and (b).

3.1.1.12 As required by 10 CFR 50.55a(b)(2)(xviii)(C), when qualifying visual examination personnel for VT-3 visual examinations under paragraph IWA-2317 of the 2001 Edition with 2003, the proficiency of the training must be demonstrated by administering an initial qualification examination and administering subsequent examinations on a 3-year interval.

3.1.1.13 As required by 10 CFR 50.55a(b)(2)(xix), Entergy will apply the rules in IWA-2240, "Alternative Examinations," of Section XI, 1997 Addenda in lieu of the IWA-2240 requirements in Section XI, 2001 Edition with 2003 Addenda for the substitution of alternative examination methods.

3.1.1.14 As required by 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 Nos. B3.120 and B3.140 of Inspection Program B in the 1998 Edition will be applied by Entergy. As allowed by 10 CFR 50.55a(b)(2)(xxi)(A), 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 in Table IWB-3512-1, 1998 Edition with 2000 Addenda may be performed in place of an ultrasonic examination.

3.1.1.15 The requirements of 10 CFR 50.55a(b)(2)(xxi)(B) for Table IWB-2500-1, Examination Category B-G-2, Item B7.80, Pressure Retaining CRD Housing Bolting does not apply.

3.1.1.16 Entergy will not implement the provision in IWA-2200, “Surface Examination” that allows the use of an ultrasonic examination method. The use of this provision is prohibited by 10 CFR 50.55a(b)(2)(xxii).

3.1.1.17 Entergy will not implement Appendix VIII and the supplements to Appendix VIII and Article I-3000 in the 2002 Addenda and the 2003 Addenda of the 2001 Edition. The use of these requirements is prohibited by 10 CFR 50.55a(b)(2)(xxiv).

3.1.1.18 Entergy will not implement the option in 10 CFR 50.55a(g)(4)(iii) to perform surface examinations on High Pressure Safety Injection System welds specified in Table IWB-2500-1, Examination Category B-J, Item Numbers B9.20, B9.21, and B9.22. Examination of these welds is being addressed in accordance with the Risk-Informed ISI Program application.

3.1.2 ASME Section XI Code Cases

ASME Section XI Code Cases incorporated into the ISI Program Plan applicable to nondestructive examination requirements for Class 1, 2, and 3 components and component supports are listed in Table 3.3-1. A detailed explanation of ASME Section XI Code Case implementation is included in Section 3.3. Code Cases applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in Program Sections CEP-PT-001, CEP-CISI-101 and CEP-R&R-001, respectively.

3.1.3 Requests For Relief and Requests For Alternatives

Modifications to ASME Section XI requirements applicable to nondestructive examination requirements for Class 1, 2, and 3 components and component supports incorporated into the ISI Program Plan by way of a Request for Alternative or a Request for Relief submitted to the NRC in accordance with 10 CFR 50.55a(a)(3) or 10 CFR 50.55a(g)(5), respectively, are listed in Table 3.4-1. A detailed explanation of Requests For Relief and Requests For Alternatives implementation is included Section 3.4. Requests For Relief and Requests For Alternatives applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in Program Sections CEP-PT-001, CEP-CISI-101 and CEP-R&R-001, respectively.

3.2 Later Editions and Addenda of ASME Section XI

The use of later Editions and/or Addenda of ASME Section XI is permitted with specific NRC approval. On July 28, 2004, the NRC published Regulatory Issue Summary (RIS) 2004-12, "Clarification on Use of Later Editions and Addenda to the ASME OM Code and Section XI". This RIS requires Entergy to submit later editions and addenda to the staff via a request for approval.

Additionally, as the NRC determines appropriate through changes to 10 CFR 50.55a, the NRC sometimes mandate the use of later portions of ASME Section XI. This program sub-section identifies those later Editions and/or Addenda that have been included into the ISI Program Plan based on NRC approval in 10 CFR 50.55a. The use of later Editions and Addenda of ASME Section XI will be reflected in Sub-section 3.1 when incorporated into this ISI Program Plan.

3.3 ASME Section XI Code Cases Incorporated Into The ISI Program

Alternatives to ASME Section XI requirements that are provided in Code Cases may be incorporated into the ISI Program as described below.

The use of Code Cases is in accordance with 10 CFR 50.55a. ASME Code Cases that have been determined to be suitable for use in ISI Program Plans by the NRC are listed in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI, Division 1". Table 3.3-1 lists the ASME Section XI Code Cases which have been incorporated into the ISI Program Plan. Code Cases that are "Acceptable" or "Conditionally Acceptable" in Regulatory Guide 1.147 are shown with the revision number of Regulatory Guide 1.147 that first approved it. If conditions are stipulated for a Code Case in Regulatory Guide 1.147, Entergy will meet these conditions when applying the Code Case.

Code Cases not endorsed in the current revision of Regulatory Guide 1.147 are shown with a Request for Alternative number. A corresponding Request For Alternative has been prepared to employ the Code Case (see Table 3.4-1 for status of the Request for Alternative). The use of Code Cases (other than those listed in Regulatory Guide 1.147) may be authorized by the Director of the Office of Nuclear Reactor Regulation upon request pursuant to 10 CFR 50.55a(a)(3) via acceptance of the associated Request for Alternative.

Note that only Codes Cases applicable to nondestructive examination requirements for Class 1, 2, and 3 components and component supports are addressed in Table 3.3-1. Code Cases applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in Program Sections CEP-PT-001, CEP-CISI-101 and CEP-R&R-001, respectively.

At the time this ISI Program Plan was originally issued, Revision 15 of Regulatory Guide 1.147 was the latest version of the Regulatory Guide that was available for use.

TABLE 3.3-1
CODE CASES INCORPORATED INTO THE ISI PROGRAM

Code Case	Title/ Regulatory Guide 1.147 Conditions For Use	RG 1.147 Revision/ Request for Alternative
N-460	Alternative Examination Coverage for Class 1 and Class 2 Welds	14
N-526	Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels	14
N-532-4	Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission	15
N-545	Alternative Requirements for Conduct of Performance Demonstration Detection Test of Reactor Vessel	14
N-552	Alternative Methods - Qualification for Nozzle Inside Radius Section from the Outside Surface Conditions of Regulatory Guide 1.147: To achieve consistency with the 10CFR50.55a 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 the detection criteria, "The number of false calls must not exceed three.	14
N-586-1	Alternative Additional Examination Requirements for Class 1, 2, and 3 Piping, Components, and Supports	15
N-593	Alternative Examination Requirements for Steam Generator Nozzle to Vessel Welds Conditions of Regulatory Guide 1.147: Essentially 100 percent (not less than 90 percent) of the examination volume A-B-C-D-E-F-G-H must be inspected.	14
N-613-1	Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Item No's. B3.10 and B3.90, Reactor Vessel-to-Nozzle Welds, Fig. IWB-2500-7(a), (b), and (c)	14
N-624	Successive Inspections	14
N-639	Alternative Calibration Block Material Conditions of Regulatory Guide 1.147: Chemical ranges of the calibration block may vary from the materials specification if: (1) it is within the chemical range of the component 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.	14

Code Case	Title/ Regulatory Guide 1.147 Conditions For Use	RG 1.147 Revision/ Request for Alternative
N-648-1	Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles Conditions of Regulatory Guide 1.147: In place of a 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.	14
N-664	Performance Demonstration Requirements for Examination of Unclad Reactor Pressure Vessel Welds, Excluding Flange Welds	14
N-685	Lighting Requirements for Surface Examination	15
N-686	Alternative Requirements for Visual Examinations, VT-1, VT-2, and VT-3	15
N-695	Qualification Requirements for Dissimilar Metal Piping Welds	14
N-696	Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface	15
N-697	Pressurized Water Reactor (PWR) Examination and Alternative Examination Requirements for Pressure Retaining Welds in Control Rod Drive and Instrument Nozzle Housings	15
N-700	Alternative Rules for Selection of Classes 1, 2, and 3 Vessel Welded Attachments for Examination	15
N-716	Alternative Piping Classification and Examination Requirements Conditions of Regulatory Guide 1.147: Pending - Not Currently Addressed in Regulatory Guide 1.147	ANO1-ISI-012
N-747	Reactor Vessel Head-to-Flange Weld Examinations Conditions of Regulatory Guide 1.147: Not Currently Addressed in Regulatory Guide 1.147	CEP-ISI-11
N-753	Vision Tests Conditions of Regulatory Guide 1.147: Pending - Not Currently Addressed in Regulatory Guide 1.147	CEP-ISI-12

3.4 Requests For Relief and Requests For Alternatives from ASME Section XI Requirements

Table 3.4-1 contains an index of Requests For Alternatives and Requests For Relief written in accordance with 10CFR50.55a (a)(3) and (g)(5), as discussed in Section 2.1.4. The applicable Entergy submittal and NRC SER correspondence numbers are also included in Table 3.4-1 for each Request For Alternatives and Request For Relief.

Note that only Requests for Alternatives or Requests for Relief applicable to nondestructive examination requirements for Class 1, 2, and 3 components and component supports are addressed in Table 3.4-1. Requests for Alternatives or Requests for Relief applicable to System Pressure Testing, Containment Inservice Inspection and Repair/Replacement Activities are addressed in Program Sections CEP-PT-001, CEP-CISI-101 and CEP-R&R-001, respectively.

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 a Section XI examination is obtained.

TABLE 3.4-1
REQUESTS FOR RELIEF AND REQUESTS FOR ALTERNATIVES FROM ASME SECTION XI REQUIREMENTS

Request Number	Request Description	Entergy Correspondence / NRC SER Correspondence
CEP-ISI-11	Request to Utilize The Alternative Requirements of Code Case N-747; Reactor Vessel Head-to-Flange Weld Examinations	CNRO2008-00016
CEP-ISI-12	Request to Utilize The Alternative Requirements of Code Case N-753; Vision Tests	CNRO2008-00016
ANO1-ISI-012	Request to Utilize The Alternative Requirements of Code Case N-716; Alternative Piping Classification and Examination Requirements	1CAN050806

3.5 Augmented Examinations Plans

Augmented examinations are considered in one of the following three categories: augmented examinations for external commitments, Owner elected examinations for internal commitments and license renewal examinations for aging management commitments. These three types of examinations are described in Sections 3.5.1, 3.5.2 and 3.5.3 of below. In addition, each section includes a table which lists the applicable augmented program. Details on the various examinations and frequencies are provided in Appendix B.

3.5.1 Augmented Examinations

This type of augmented examination is conducted to meet a commitment made to a source outside the utility. Typically these are commitments made to the NRC in response to regulatory documents such as Generic Letters, Bulletins and NUREGs. The augmented examinations for external commitments covered in this program are listed in Table 3.5-1.

3.5.2 Owner Elected Examinations

This type of augmented examination is conducted to meet a commitment made internally at the plant. These typically involve examinations resulting from Condition Reports or similar documents that identify conditions in the plant that warrant monitoring, but are outside the scope of ASME Section XI. The Owner elected examinations for internal commitments are listed in Table 3.5-2.

3.5.3 License Renewal Examinations

This type of augmented examination is conducted to ensure the integrity of components during the license extension period. These typically involve components or criteria that are beyond those of ASME Section XI, but in some cases may supplement existing Code or regulatory requirements. The license renewal examinations for aging management commitments are listed in Table 3.5-3.

The aging management commitments for ANO-1 that are listed in Table 3.5-3 were identified in the ANO-1 License Renewal Application.

TABLE 3.5-1

AUGMENTED EXAMINATIONS FOR EXTERNAL COMMITMENTS

SOURCE DOCUMENT	TITLE/DESCRIPTION
IE Bulletin 79-17	Examinations for Pipe Cracks in Stagnant, Borated Systems at PWR Plants
NRC Generic Letter 97-01	Inspection of Control Rod Drive Mechanisms
NRC Generic Letter 85-020.	HPI nozzle thermal sleeve cracking
NUREG-0612	Control of Heavy Loads at Nuclear Power Plants
NUREG-0800, Section 3.6.2	Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants - Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping (Examination of High Energy Line Break Piping)
NRC Regulatory Guide 1.14	Reactor Coolant Pump Flywheel Integrity
B&W Letter APL-85-349	Emergency Feedwater Riser Welds
PIE 87-0082B	Ultrasonic Examinations on Reactor Coolant Pump Shafts and Surface Examinations on Reactor Coolant Pump Shaft Covers
NRC Regulatory Guide 1.150	Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations
10 CFR 72	Dry Spent Fuel Storage Casks

TABLE 3.5-2

OWNER ELECTED EXAMINATIONS FOR INTERNAL COMMITMENTS

SOURCE DOCUMENT	TITLE/DESCRIPTION
0CNA038931	Visual Inspection of Steam Generator Manways and Handholes
Calc. 86E-0074-103	Pressurizer Upper Level Tap Temporary Repair Ultrasonic Examination
CR 1-90-0853-07	Pressurizer Upper Level Tap Visual Examinations
CR-1-92-0244 and CR-1-01-0131	Ultrasonic Examinations on Relief Valve Piping
CR-1-97-0206	RT of Lower Fillet Weld on FO-1241
CR-ANO-1-96-0502	Visual inspections on High Pressure Injection (HPI) Support MU-167 and Associated Piping
CR-1-90-0514, CA 11	Visual inspections on Reactor Coolant Pump Seal Injection Piping and Supports
CR-ANO-2-1998-00242	Visual inspections on Main Steam Tie-Back Supports
CR-ANO-1-96-0391	Visual inspections on Decay Heat Vent and Drains Tie-Back Supports
CR-ANO-1-96-0391	Visual inspections on Balancing Plates, Hot Leg Level Taps

TABLE 3.5-3

LICENSE RENEWAL EXAMINATIONS FOR AGING MANAGEMENT COMMITMENTS

SOURCE DOCUMENT	TITLE/DESCRIPTION
FSAR 16.1.4.1	Pressurizer Cladding Examination
FSAR 16.1.4.2	Pressurizer Heater Bundle Penetration Welds Examination
FSAR 16.2.3.1	ASME Section XI Subsection IWB Inservice Inspections for Class 1 Components
FSAR 16.2.3.2	ASME Section XI Subsection IWC Inservice Inspections for Class 2 Components
FSAR 16.2.3.3	ASME Section XI Subsection IWD Inservice Inspections for Class 3 Components
FSAR 16.2.3.4	ASME Section XI Subsection IWE Inservice Inspections for Class MC Components
FSAR 16.2.3.5	ASME Section XI Subsection IWF Inservice Inspections for Class 1, 2, 3, and MC Component Supports
FSAR 16.2.3.6	ASME Section XI Subsection IWL Inservice Inspections for Class CC Components
FSAR 16.2.3.7	Augmented Inspections: Examination of Non-Classed Main Feedwater and Main Steam Piping Welds in Support of High Energy Line Break Analysis
FSAR 16.2.3.7	Augmented Inspections: Examination of BWST Header Including Lines from the Reactor Building Sump
FSAR 16.2.3.7	Augmented Inspections: Examination of the Piping Welds Wetted by the Reactor Building Sump Water
FSAR 16.2.3.7	Augmented Inspections: Supplemental Examination of the “Q” Stainless Steel Piping of the Main Steam System
FSAR 16.2.3.7	Augmented Inspections: Examination of the Penetration 68 Piping and Components and the Decay Heat Pump Room Drain Valves
FSAR 16.2.3.7	Augmented Inspections: Examination of Penetrations 10, 47, 58 and 64
FSAR 16.2.3.7	Augmented Inspections: Visual Examination of Pressure Retaining Surfaces of One Reactor Coolant Pump
FSAR 16.2.3.7	Augmented Inspections: Volumetric/Non-Destructive Examination of Sodium Hydroxide System Stainless Steel Tubing and Valves
FSAR 16.2.3.7	Augmented Inspections: Volumetric/Non-Destructive Examination of Chilled Water System Stainless Steel Tubing and Valves
FSAR 16.2.3.8	Small Bore Piping and Small Bore Nozzle Inspections

3.6 Successive Inspections and Additional Examinations

Successive Inspections required to be performed in accordance with IWB-2420, IWC-2420, IWD-2420 and IWF-2420 are identified in the IDDEAL® database Scheduleworks® module by an “h” (scheduled successive inspection) or an “H” (completed successive inspection).

Additional Examinations required to be performed in accordance with IWB-2430, IWC-2430, IWD-2430 and IWF-2430 are identified in the IDDEAL® database Scheduleworks® module by an “e” (scheduled additional examination) or an “E” (completed additional examination).

3.7 Systems and Components Subject To Examination

The systems and components included in the Inservice Inspection Program are identified in the ANO-1 Boundary Diagrams. A listing of these ISI Boundary Diagrams is included on drawings P-200 Sheet. These systems and components are referred to as “ISI Class 1”, “ISI Class 2” or “ISI Class 3” and are subject to the requirements of ASME Section XI, Subsections IWB, IWC, and IWD, respectively.

Systems and components at ANO-1 designed in accordance with Nuclear Class I, II, and III requirements are included in the ISI Program. In addition, systems and components designed in accordance with Non-Nuclear Power Class requirements that are nuclear safety related are included in the ISI Program. Some of these systems and components are excluded or exempted from Section XI requirements because they are optionally upgraded to Code Class as discussed in IWA-1320(e) or because they do not perform the functions listed in IWD-1210(a) to (f). For a full explanation of the implementation of Section XI requirements (including exemptions and exclusions) at ANO-1 see the Piping Line Coding Legends and Exemption and Exclusion Flag Legends on drawing P-200 Sheet 1.

3.8 Nonexempt ASME Class Components and Component Supports

The ISI Class 1, 2, and 3 components which are not exempt from examination per ASME Section XI, IWB-1220, IWC-1220, IWD-1220, and IWF-1230 are identified on the ISI Boundary Diagrams in accordance with the Pipe Line Codings on drawings P-200 Sheet 1. Non-exempt components are not included within flags corresponding to Section XI exemptions listed in the plant Exemption and Exclusion Flag Legend.

3.9 Exempt ASME Class Components and Component Supports

The ISI Class 1, 2, and 3 components which are exempt from examination are those which meet the criteria of ASME Section XI, IWB-1220, IWC-1220, and IWD-1220. Component supports which meet the criteria of IWF-1230 are also exempt from examination. Exempt components are identified on the ISI Boundary Diagrams in accordance with the Exemption and Exclusion Flag Legends on drawings P-200 Sheet 1. Exempt component supports are supports of components which are exempt from examination per IWB-1220, IWC-1220, and IWD-1220.

ASME Section XI, IWC-1222(b) presents separate exemption criteria for Class 2 auxiliary feedwater systems in pressurized water reactor plants. For ANO-1, there is a conflict with the nomenclature for this piping regarding the application of IWC-1222(b) requirements.

At ANO-1, the system that performs the auxiliary feedwater function is referred to as the Emergency Feedwater System (EFW).

Because only the safety related portions of the auxiliary feedwater systems (i.e., Emergency Feedwater for ANO-1) have been classified as ISI Class 2, the components in these systems will be subject to the exemption criteria of ASME Section XI, IWC-1222 and subsequent examination criteria of Table IWC-2500-1.

3.10 ISI Isometrics and ISI Equipment Drawings

ISI Isometrics and ISI Equipment Drawings were developed to identify the ISI Class 1, 2, and 3 components (welds, bolting, etc.) and component supports which are subject to examination per ASME Section XI. The ISI Isometrics and ISI Equipment Drawings were developed to support the ISI Program and are not to be used for design information. ISI Isometrics and ISI Equipment Drawings are available for each site as follows.

An index of the isometrics utilized for ISI is included in Appendix A. These isometrics are plant isometrics that have been edited to support the ISI Program (plant vendor drawings serve as ISI Component drawings).

3.11 Calibration Standards

Calibration standards are used to calibrate ultrasonic examination equipment. These standards were used during preservice examinations and during the previous ISI intervals, and are maintained at ANO-1. Calibration standards are listed in the IDDEAL® database.

Calibration block thickness is the same nominal thickness as the material being examined. Any calibration block thickness that is within ± 25% of the material being examined may be considered to be the same nominal thickness.

Alternative calibration blocks may be used if the referencing procedure allows the use of such blocks.

Additions or changes to the calibration blocks listed in the IDDEAL® database shall be requested with the use of a Program Database Change Notice (PDCN) in accordance with Program Section CEP-COS-0110.

3.12 IDDEAL® ISI Database

The IDDEAL® database and associated software are electronic tools utilized at ANO-1 to manage the data and documents comprising the ISI Program Plan.

Scheduling and component information is controlled by the Scheduleworks® module of the IDDEAL® database. The IDDEAL® database is controlled in accordance with CEP-COS-0110.

The IDDEAL® database is a master component inspection item list that acts as the focal point to access individual items and information scheduled for work. Individual information for specific scheduled components pertaining to unique item specifications, reference drawings, procedures, inspection records and individual examination requirements is integrated within the

program. Inspection item planning and scheduling is accessed for organizing and tracking inspection scopes with the ability to create/view inspection work packages and track results on specific NDE method inspection data forms.

Augmented and owner elected examinations applicable to each site are also controlled in the site's ISI database in the ScheduleWorks® Module of the IDDEAL® Software Suite. License renewal examinations will be added, if required, as each commitment is defined.

Each examination has been scheduled to meet the requirements listed in Appendix B. These examinations are scheduled either by interval or by a set outage frequency. Examinations scheduled as once per interval may be rescheduled as allowed by CEP-ISI-0110. Examinations that are scheduled based on outage requirements and require rescheduling must be approved by the appropriate site owner and documented via the PDCN process in accordance with CEP-COS-0110.

3.13 Incomplete or Missing Examinations

Resolution and tracking of incomplete or missed examinations shall be in accordance with the Program Change Notice / Condition Report (PCN/CR) process as described below:

3.13.1 PCN Requirements

A PCN to the program shall be developed in a timely manner. The PCN should contain the following:

a) The affected component.

b) The examination requirement that has not been, or will not be, met.

c) The reason for incomplete or missed examination.

d) Alternate examinations performed or recommended, (i.e. best effort vs. VT-1, etc.) to include reasons why this is acceptable.

e) For partial examinations, the extent of coverage the component received or will receive using approved methods.

3.13.2 Request for Relief

If a Request for Relief is required for an incomplete or missing examination, the following steps shall be completed:

a) The site should develop and submit the necessary documentation to the NRC.

b) If the Request for Relief is approved by the NRC, the approval should be incorporated into the program plan by a PCN.

c) If the Request for Relief is disapproved, the site should initiate a CR.

3.13.3 Missed Examinations Which Cannot Be Made Up

If it is discovered that a required examination has been missed and cannot be performed before the end of the inspection period in accordance with the Program Plan, a CR should be initiated. Note that the period includes any extensions made within the ASME Section XI and 10 CFR 50.55a provisions. The end of the period does not occur until any applicable extensions are completed.

APPENDIX A

DRAWING INDEX

Below is a listing of the Piping Isometric Drawings for systems subject to inservice inspection (ISI). These drawings identify piping welds, flanges, valves, pumps, and piping supports that are within the non-exempt piping boundaries. In addition, system identifications, pipe classifications, pipe sizes, containment penetrations and piping configurations are identified. Piping and components that are exempt from nondestructive and visual examination in accordance with ASME Section XI, paragraphs IWB-1220, IWC-1220, and IWD-1220 may also be depicted on these drawings. If exempt piping or components are shown, it is for information only.

DRAWING NUMBER	TITLE
1-MS-1	LARGE PIPE ISOMETRIC MAIN STEAM FROM STEAM GENERATOR E-24A
1-MS-2	LARGE PIPE ISOMETRIC MAIN STEAM FROM STEAM GENERATOR E-24A
1-MS-3	LARGE PIPE ISOMETRIC MAIN STEAM FROM STEAM GENERATOR E-24B
1-MS-4	LARGE PIPE ISOMETRIC STEAM GENERATOR E-24B SECONDARY LINE FROM CONTAINMENT TO CV-2692
1-MS-5 (Sht 1)	LARGE PIPE ISOMETRIC MAIN STEAM TO ISOLATION VALVES UPSTREAM OF EMERGENCY FEEDWATER PUMP TURBINE K-3
1-MS-5 (Sht 2)	LARGE PIPE ISOMETRIC MAIN STEAM LINE ATMOSPHERIC DUMP (CV-2668)
1-MS-101	LARGE PIPE ISOMETRIC MAIN STEAM HEADER
1-MS-103	LARGE PIPE ISOMETRIC MAIN STEAM HEADER
1-MS-118 (Sht 1)	LARGE PIPE ISOMETRIC STEAM ADMISSION SYSTEM TO EMERGENCY FEEDWATER TURBINE (K-3)
1-MS-118 (Sht 2)	LARGE PIPE ISOMETRIC STEAM ADMISSION TO EMERGENCY FEEDWATER TURBINE (K-3)
2-MFW-1	LARGE PIPE ISOMETRIC MAIN FEEDWATER TO STEAM GENERATOR E-24B
2-MFW-2	LARGE PIPE ISOMETRIC MAIN FEEDWATER
2-MFW-110	LARGE PIPE ISOMETRIC MAIN FEEDWATER
3-EFW-107	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER
3-EFW-108 (Shts 1 and 2)	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-109	LARGE PIPE ISOMETRIC EMERGENCY DISCHARGE FEEDWATER PUMP P-7A TO ISOLATION VALVE
3-EFW-110 (Sht 1)	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-110 (Sht 2)	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER FROM P-7B TO CV-2626

DRAWING NUMBER	TITLE
3-EFW-111	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER FROM P-7B TO CV-2670
3-EFW-112	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-113 (Shts 1 and 2)	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER PUMP P-7A & P-7B INLET PIPING
3-EFW-114 (Shts 1, 2 & 3)	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER PUMP INLET HEADER PIPING
3-EFW-115 (Sht 1)	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER PUMP P-7B PIPING TO CV-2670
3-EFW-115 (Sht 2)	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-116 (Shts 1, 2 & 3)	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-117	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-118	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
3-EFW-119	EMERGENCY FEEDWATER SYSTEM PIPING ISOMETRIC
5-BS-1	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY
5-BS-2	LARGE PIPE ISOMETRIC SPRAY PUMP DISCHARGE
5-BS-3	LARGE PIPE ISOMETRIC SPRAY PUMP DISCHARGE TO BORATED WATER STORAGE TANK
5-BS-4	LARGE PIPE ISOMETRIC P-35A DISCHARGE TO CONTAINMENT AND RETURN TO BWST
5-BS-5	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY
5-BS-6	LARGE PIPE ISOMETRIC SPRAY PUMP SUCTION
5-BS-7	LARGE PIPE ISOMETRIC SPRAY PUMP SUCTION
5-BS-101	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY SYSTEM
5-BS-102	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY SYSTEM
5-BS-103	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY
5-BS-109	LARGE PIPE ISOMETRIC REACTOR BUILDING SPRAY
6-CF-1	LARGE PIPE ISOMETRIC CORE FLOODING TO REACTOR
6-CF-2	LARGE PIPE ISOMETRIC CORE FLOODING TO REACTOR
7-DH-1	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL TO REACTOR
7-DH-2	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE TO REACTOR
7-DH-3	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL FROM REACTOR
7-DH-4	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL FROM REACTOR
7-DH-5	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE

DRAWING NUMBER	TITLE
7-DH-6	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE
7-DH-8	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE
7-DH-9	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL
7-DH-10	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE
7-DH-11	LARGE PIPE ISOMETRIC DECAY HEAT PUMP DISCHARGE
7-DH-12 (Shts 1 and 2)	LARGE PIPE ISOMETRIC ENGINEERED SAFEGUARDS PUMP SUCTION HEADER
7-DH-13	LARGE PIPE ISOMETRIC DECAY HEAT PUMP SUCTION HEADER
7-DH-14	LARGE PIPE ISOMETRIC PRIMARY MAKE UP PUMP SUCTION HEADER
7-DH-15	LARGE PIPE ISOMETRIC MAKE-UP PUMP SUCTION
7-DH-16	LARGE PIPE ISOMETRIC DECAY HEAT PUMP SUCTION FROM REACTOR BUILDING SUMP
7-DH-17	LARGE PIPE ISOMETRIC DECAY HEAT PUMP SUCTION FROM REACTOR BUILDING SUMP
7-DH-22	LARGE PIPE ISOMETRIC BORATED WATER STORAGE TANK PURIFICATION
7-DH-22A	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL TO REACTOR
7-DH-23	LARGE PIPE ISOMETRIC DECAY HEAT REMOVAL TO REACTOR
7-DH-102	LARGE PIPE ISOMETRIC BORATED WATER STORAGE TANK PIPING
7-DH-103	LARGE PIPE ISOMETRIC BORATED WATER STORAGE TANK PIPING
12-CON-141	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER FROM T-41B TO EFW PUMPS P-7A AND P-7B
12-CON-142	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER FROM T-41B TO EFW PUMPS P-7A AND P-7B
12-CON-143	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER FROM T-41B TO EFW PUMPS P-7A AND P-7B
12-CON-144	LARGE PIPE ISOMETRIC EMERGENCY FEEDWATER PIPING FROM T-41B TO EFW PUMPS P-7A AND P-7B
12-CON-147	EMERGENCY FEEDWATER RECIRCULATION TO T41B
13-SW-1	LARGE PIPE ISOMETRIC SERVICE WATER PENETRATION PIPING TO VCC-2C & 2D
13-SW-2	SERVICE WATER FROM VCC-2C & 2D
13-SW-3	LARGE PIPE ISOMETRIC SERVICE WATER PENETRATION PIPING
13-SW-4	LARGE PIPE ISOMETRIC SERVICE WATER PENETRATION PIPING
13-SW-101	LARGE PIPE ISOMETRIC SERVICE WATER (ESSENTIAL)
13-SW-102	LARGE PIPE ISOMETRIC SERVICE WATER (ESSENTIAL)

DRAWING NUMBER	TITLE
13-SW-103	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO VCC-2A & VCC-2B
13-SW-104	LARGE PIPE ISOMETRIC SERVICE WATER ESSENTIAL RETURN
13-SW-105	LARGE PIPE ISOMETRIC SERVICE WATER VCC-2A & 2B RETURN
13-SW-106	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY LOOP I
13-SW-108	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO COOLER E-35A
13-SW-110	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY
13-SW-111	LARGE PIPE ISOMETRIC SERVICE WATER RETURN FROM EMERGENCY DIESEL GENERATOR JACKET COOLERS
13-SW-112	LARGE PIPING ISOMETRIC SERVICE WATER RETURN
13-SW-113	LARGE PIPE ISOMETRIC E-35A RETURN
13-SW-114	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO EMERGENCY POOL
13-SW-115	LARGE PIPE ISOMETRIC SERVICE WATER RETURN
13-SW-116	LARGE PIPE ISOMETRIC SERVICE WATER RETURN FROM DECAY HEAT EXCHANGER E-35B
13-SW-118	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO DECAY HEAT EXCHANGER E-35B
13-SW-119	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY
13-SW-120	LARGE PIPE ISOMETRIC SERVICE WATER RETURN
13-SW-122	LARGE PIPE ISOMETRIC SERVICE WATER TO EMERGENCY FEEDWATER SUCTION
13-SW-126	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY ESSENTIAL
13-SW-128	SERVICE WATER FROM VCC-2C & D
13-SW-129	SERVICE WATER FROM VCC-2A & B
13-SW-130	SERVICE WATER SUPPLY TO VCC-2A & B
13-SW-131	SERVICE WATER SUPPLY TO VCC-2C & D
13-SW-132	SERVICE WATER SUPPLY
13-SW-133	LARGE PIPE ISOMETRIC SERVICE WATER PUMP TO DISCHARGE
13-SW-134	LARGE PIPE ISOMETRIC SERVICE WATER ESSENTIAL
13-SW-135	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO VCC-2D
13-SW-136	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY TO VCC-2A
13-SW-137	LARGE PIPE ISOMETRIC SERVICE WATER RETURN FROM VCC-2D
13-SW-138	SERVICE WATER RETURN FROM VCC-2A
13-SW-141	LARGE PIPE ISOMETRIC SERVICE WATER RETURN
13-SW-142	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY ESSENTIAL

DRAWING NUMBER	TITLE
13-SW-143 (Shts 1 and 2)	LARGE PIPE ISOMETRIC SERVICE WATER RETURN FROM E20B1 AND E20B2 FOR K4B
13-SW-149	LARGE PIPE ISOMETRIC CONTAINMENT COOLING COIL VCC-2D SUPPLY AND RETURN PIPING
13-SW-150	LARGE PIPE ISOMETRIC CONTAINMENT COOLING COIL VCC-2B SUPPLY AND RETURN PIPING
13-SW-151	SERVICE WATER CONNECTIONS FOR VCC-2C
13-SW-152	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY AND RETURN FOR REACTOR BUILDING COOLING COIL VCC-2A
13-SW-154	LARGE PIPE ISOMETRIC SERVICE WATER RETURN
13-SW-156	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY
13-SW-162	LARGE PIPE ISOMETRIC SERVICE WATER SUPPLY ESSENTIAL
16-RC-4	LARGE PIPE ISOMETRIC PRESSURIZER RELIEF PIPING FROM PSV-1001 TO QUENCH TANK T-42
16-RC-6	LARGE PIPE ISOMETRIC PRESSURIZER RELIEF DOWNSTREAM OF RELIEF VALVE PSV-1000
16-RC-8	LARGE PIPE ISOMETRIC PRESSURIZER RELIEF PIPING FROM PSV-1002 TO QUENCH TANK T-42
16-RC-9	PRESSURIZER MAIN SPRAY LINE CCA-4
17-MU-1	LARGE PIPE ISOMETRIC SYSTEM #17 MAKE UP & PURIFICATION
17-MU-2 (Sht 1)	LARGE PIPE ISOMETRIC MAKE UP & PURIFICATION
17-MU-2 (Sht 2)	LARGE PIPE ISOMETRIC MAKE UP & PURIFICATION FROM LETDOWN COOLERS TO DECAY TANK
17-MU-17	LARGE PIPE ISOMETRIC MAKE-UP PUMP SUCTION
17-MU-18	LARGE PIPE ISOMETRIC MAKE-UP PUMP SUCTION
17-MU-19	LARGE PIPE ISOMETRIC MAKE-UP PUMP SUCTION
17-MU-20	LARGE PIPE ISOMETRIC MAKE-UP PUMP DISCHARGE
17-MU-21	LARGE PIPE ISOMETRIC SEAL FLOW TO REACTOR COOLANT PUMPS
17-MU-22	LARGE PIPE ISOMETRIC MAKE UP TO REACTOR COOLANT SYSTEM
17-MU-23	LARGE PIPE ISOMETRIC RCP P-32D HP INJECTION AND CROSS CONNECTION
17-MU-24	LARGE PIPE ISOMETRIC HP INJECTION TO RCS
17-MU-25	LARGE PIPE ISOMETRIC HIGH PRESSURE INJECTION TO REACTOR COOLANT SYSTEM
17-MU-26	LARGE PIPE ISOMETRIC HP INJECTION TO REACTOR COOLANT PUMP P-32A

DRAWING NUMBER	TITLE
17-MU-27	LARGE PIPE ISOMETRIC HP INJECTION TO REACTOR COOLANT PUMP P-32B
17-MU-28	LARGE PIPE ISOMETRIC HIGH PRESSURE INJECTION TO REACTOR COOLANT SYSTEM
17-MU-29	LARGE PIPE ISOMETRIC HIGH PRESSURE INJECTION TO REACTOR COOLANT PUMP P-32C (LOOP C)
17-MU-30	LARGE PIPE ISOMETRIC P-32C HP INJECTION
17-MU-31	LARGE PIPE ISOMETRIC HIGH PRESSURE INJECTION TO REACTOR COOLANT PUMP P-32D
17-MU-37	LARGE PIPE ISOMETRIC REDUNDANT HPI INJECTION TO REACTOR COOLANT SYSTEM OUTSIDE CONTAINMENT: LOOPS “A” & “B”
17-MU-38	LARGE PIPE ISOMETRIC REDUNDANT HPI INJECTION TO REACTOR COOLANT SYSTEM OUTSIDE CONTAINMENT: LOOPS “C” & “D”
LWA-200	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP P-32A & B DRAINS TO REACTOR BUILDING DRAIN HEADER
LWA-201	SMALL PIPE ISOMETRIC REACTOR COOLANT SYSTEM VENTS, DRAINS AND MISCELLANEOUS PIPING
MS-210	SMALL PIPE ISOMETRIC STEAM TRAP 5 PIPING
MU-200	SMALL PIPE ISOMETRIC MAKE-UP PUMP DISCHARGE 2P-36A, B & C DISCHARGE TO 2E-26A & B
MU-201	SMALL PIPE ISOMETRIC PRIMARY MAKE-UP PUMP P-36A, B & C DISCHARGE TO SEAL RETURN COOLERS E-26A & B
MU-204	SMALL PIPE ISOMETRIC SEAL FLOW TO REACTOR COOLANT PUMPS
MU-206	SMALL PIPE ISOMETRIC P-32D CONTROLLED BLEED OFF
MU-210	SMALL PIPE ISOMETRIC P-32D SEAL INJECTION
MU-219	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP, P-32A CONTROLLED BLEED OFF
MU-220	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP, P-32C SEAL INJECTION
MU-221	SMALL PIPE ISOMETRIC P-32A SEAL INJECTION
MU-223	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP, P-32B SEAL INJECTION
MU-224	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP P-32B CONTROLLED BLEED OFF PIPING
MU-225	SMALL PIPE ISOMETRIC REACTOR COOLANT PUMP P-32C CONTROLLED BLEED OFF PIPING
RC-203	PRESSURIZER AUX. SPRAY LINE CCA-9 & CCB-9

APPENDIX B

AUGMENTED EXAMINATIONS

I. AUGMENTED EXAMINATIONS FOR EXTERNAL COMMITMENTS

ANO1-R&R-010: Volumetric Examinations of Weld Overlay including upper 25% of original weld

Source Document: ANO1-R&R-010

Commitment No.: None

Associated Document: None

Purpose: Ensure cracking does not propagate into the upper 25% of the original base metal of dissimilar metal welds that contain alloy that are mitigated by overlay.

Scope: Pressurizer Nozzle Dissimilar Metal Welds (6) and Hot Leg-to-Surge Line Nozzle Dissimilar Metal Weld (1).

Method: Perform ultrasonic examinations of the proposed preemptive full structural weld overlays in accordance with Appendix VIII, Supplement 11 of the 1995 Edition/1996 Addenda of ASME Section XI accept as modified by the Performance Demonstration Initiative (PDI) Program. The proposed PDI alternatives to Appendix VIII, Supplement 11.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The weld overlay examination volume A-B-C-D in Figure 2 shall be added to the inspection plan and shall be ultrasonically examined during the first or second refueling outage following application. If inservice examinations reveal crack growth, or new cracking, meeting the acceptance standards, the weld overlay examination volume shall be re-examined during the first or second refueling outage following discovery of the growth or new cracking. Weld overlay examination volumes that show no additional indication of crack growth or new cracking shall be placed into a population to be examined on a sample basis. Twenty-five percent of this population shall be examined once every ten years.

Acceptance Criteria or Standard: ASME Code Section XI, 2001 Edition through 2003 Addenda IWB-3514-2.

Regulatory Basis: ANO1-R&R-010

EFW RISER SUPPORTS & IWA: Surface inspections on Emergency Feedwater Riser Attachment Welds and Visual Examinations on Emergency Feedwater Riser Supports

Source Document: Babcock & Wilcox letter number APL-85-349.

Commitment No.: P-16456

Associated Document: None

Purpose: Surface examinations and visual (VT-3) inspections shall be performed on Emergency Feedwater riser welds in accordance with Babcock & Wilcox letter number APL-85-349. These examinations and inspections are performed once every ISI 10-Year Interval. The concern with this riser piping is the potential for water hammer.

Scope: Emergency Feedwater riser welds.

Method: The welds in the 6-inch and 3-inch piping, mounted on the exterior of the Steam Generators, receive a surface examination while the associated hangers receive a visual (VT-3) inspection.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The examinations shall be performed once every ISI 10-Year Interval.

Acceptance Criteria or Standard: ASME Code Section XI, 2001 Edition through 2003 Addenda.

Regulatory Basis: There is no regulatory basis for this augmented examination.

GL 97-01 CRDM: Inspection of Control Rod Drive Mechanisms

Source Document: NRC Generic Letter 97-01

Commitment No.: P-16351

Associated Documents: Letter No. 0CAN079703, NUREG/CR-6245, B&WOG Report BAW-2301.

Purpose: Inspection of the Control Rod Drive Mechanism (CRDM) shall be performed as committed to in 0CAN079703 “Response to Generic Letter 97-01”, dated July 29, 1997 and B&WOG Report BAW-2301, dated July 1997. These inspections are the result of an industry concern with cracking of CRDM housings.

Scope: The scope of these augmented examinations addresses the control rod drive mechanisms (CRDS) and other vessel closure head penetrations (VHPs) in the reactor pressure vessel.

Method: The subject welds shall be examined by either the liquid penetrant or ultrasonic examination method. In addition, they shall be subject to visual, VT-2 examination during system leakage tests.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The subject welds shall be examined by the liquid penetrant or ultrasonic examination once each interval, and VT-2 visually examined after each refueling outage.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWB.

Regulatory Basis: The regulatory basis for this augmented examination program is NRC Generic Letter 97-01.

HPI/MU NOZZLE RT: Inspection of HPI/Makeup Nozzles

Source Document: NRC Generic Letter 85-020

Commitment No.: P-18688

Associated Documents: Letter No. 0CNA118503, 1CAN048501, A17905, P6446.

Purpose: Inspection of the HPI nozzle thermal sleeves shall be performed as committed to in P-18688. These inspections are the result of an industry concern with cracking of thermal sleeves. The augmented exams will assess the thermal sleeve gap on the A/B/C/D HPI/MU thermal sleeves, also to verify the tips are still intact and that no axial or circumferential cracking has occurred.

Scope: The scope of these augmented examinations addresses the A/B/C/D HPI/MU thermal sleeves.

Method: The subject volume shall be examined by Radiography to assess the thermal sleeve gap on the A/B/C/D HPI/MU thermal sleeves and visual inspections of the thermal sleeves to verify the tips are still intact and that no axial or circumferential cracking has occurred. The visual exams are performed by system engineering and not tracked by this program. Also the Ultrasonic examination of the HPI/MU Safe End To Nozzle Welds. This is based on the “D” Pump 21-064 being the most susceptible and thus examined by the Risk informed ISI Plan.

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

Frequency: The subject Volumes shall be examined by the Radiography once every 5th outage, and all the HPI/MU Safe End to Nozzle Welds are dissimilar metal welds and are subject to periodic inspections per the ASME Code, Section XI, Appendix VIII for performance demonstration as part of our 10 year ISI program. Also the Ultrasonic examination of the DM welds by the Section XI program is being credited. This is based on the “D” Pump 21-064 being the most susceptible and thus examined by the Risk informed ISI Plan.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWB.

Regulatory Basis: The regulatory basis for this augmented examination program is NRC Generic Letter 85-020.

IEB 79-17 BORIC ACID EXAM: Examination for Pipe Cracks in Stagnant, Borated Systems at PWR Plants

Source Document: NRC IE Bulletin 79-17

Commitment No.: P-16452

Associated Documents: NRC Circular 76-06

Purpose: The examination of piping welds in stagnant borated-water systems shall be performed per NRC IE Bulletin 79-17. Piping attached to the Borated Water Storage Tank (BWST) was selected due to its exposure, in the early 1970s, to a chemical, sodium thiosulfate, now known to cause intergranular stress corrosion cracking (IGSCC) in stainless steel piping welds. Additionally, this same piping had been previously excluded from the ISI Program due to the exemptions allowed in earlier editions and addenda of ASME Code Section XI. The chemical contamination at ANO-1, as well as similar events at other B&W plants, was addressed in NRC IE Circular 76-06. This Circular served as the basis for Bulletin 79-17.

Scope: The scope of these augmented examinations is the thin-wall (schedule 10S) piping connecting the BWST to the inlet of several safety-related pumps. Not less than a 10% sampling of total weld count by size and wall thickness shall be inspected.

ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 also identify the augmented examination of the BWST header including lines from the reactor building sump. This license renewal commitment is discussed in Appendix A: Augmented Examination No. ANO-1-LR-10 in this document.

Method: The subject welds shall be ultrasonically examined using techniques that are specially developed for detecting intergranular stress corrosion cracking in thin-wall stainless steel piping.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The subject welds shall be examined once each interval.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWC.

Regulatory Basis: The regulatory basis for this augmented examination program is IE Bulletin 79-17.

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 examinations on special lifting devices in accordance with NUREG-0612.

Scope: As defined in Procedure 1402.091, Attachment 1, the special lifting devices addressed by this augmented examination are the tripod with cables and turnbuckles, the internals handling adaptor, the internals handling extension and the stainless steel lifting cables and adapters. 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: The subject components shall be subject to a surface examination and VT-3 visual 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. The VT-3 visual examination shall be performed prior to each heavy load lift.

Acceptance Criteria or Standard: Acceptance criteria are stated in Entergy Procedure 1402.091.

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

NUREG-0800, HELB: Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants - Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping (Examination of High Energy Line Break Piping)

Source Document: NUREG-0800, Section 3.6.2

Commitment No.: P-16450

Associated Documents: CR-ANO-1-2006-1508 CA7, WTANOWT-2007-001 CA2360, Upper Level Document ULD-0-TOP-07, FSAR A.7, 1CAN078705

Purpose: The purpose of this augmented program is to perform examinations on piping subject to High Energy Line Break (HELB) analysis criteria. Examinations are required on 100% of the subject welds per NUREG-0800, Section 3.6.2, Branch Technical Position MEB 3-1, Paragraph B.1.b(7).

Scope: Design Engineering is responsible for maintaining the following required examinations via the EC process. Any questions in respect to this augmented program shall be directed to Design Engineering for resolution. The following Table is the current list of examinations required by CR-ANO-1-2006-1508 in CA-07.

Method: Ultrasonic examinations shall be performed on the subject piping welds.

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

Frequency: Ultrasonic examinations will be performed on each of the subject welds once per 10-year interval. Examinations shall be distributed evenly between examination periods as defined by ASME Section XI. The welds selected during each period shall be distributed among the total number of piping welds to be examined to provide a representative sampling of the conditions of the welds. In addition, the following stipulations apply:

1) In the event repairs of any welds are required following any examination during successive inspection intervals, the inspection schedule for the repaired welds will revert back to the first 10-year inspection program.

2) Examinations that reveal unacceptable structural defects in a weld during an examination should be extended to require an additional inspection of another 1/3 of the welds. If further unacceptable defects are detected in the second sampling, the remainder of the welds shall be inspected.

3) Repairs, reexamination and piping pressure tests shall be conducted in accordance with Section XI of the ASME Code.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, IWB-3514.

Regulatory Basis: The regulatory basis for this augmented examination program is NRC NUREG-0800, Section 3.6.2.

RCP SEAL INJECTION EXAMS: **Visual inspections on Reactor Coolant Pump seal injection piping and supports**

Source Document:

Commitment No.: P-16456

Associated Document: Babcock & Wilcox letter number APL-85-349

Purpose: Surface examinations and visual (VT-3) inspections shall be performed on Emergency Feedwater riser welds in accordance with Babcock & Wilcox letter number APL-85-349. These examinations and inspections are performed once every ISI 10-Year Interval. The concern with this riser piping is the potential for water hammer.

Scope: Emergency Feedwater riser welds.

Method: The welds in the 6-inch and 3-inch piping, mounted on the exterior of the Steam Generators, receive a surface examination while the associated hangers receive a visual (VT-3) inspection.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The examinations shall be performed once every ISI 10-Year Interval.

Acceptance Criteria or Standard: ASME Code Section XI, 2001 Edition through 2003 Addenda.

Regulatory Basis: There is no regulatory basis for this augmented examination.

RCP SHAFTS & COVERS: Ultrasonic Examinations on Reactor Coolant Pump Shafts and Surface Examinations on Reactor Coolant Pump Shaft Covers

Source Document: PIE 87-0082B

Commitment No.: P-16455

Associated Document: CR-1-90-0853-07

Purpose: The purpose of this augmented examination is to demonstrate the integrity of the reactor coolant pump (RCP) pump shaft and pump shaft cover. This concern began with a sheared RCP shaft, referred to as a “loss of stiffness accident”, at Crystal River Nuclear Plant and two instances of cracking in BWR Recirculation pump covers.

Scope: Each reactor coolant pump’s shaft and pump shaft cover.

Method: Ultrasonic examinations shall be performed on Reactor Coolant Pump shafts and surface examinations shall be performed on Reactor Coolant Pump shaft covers in accordance with Plant Impact Evaluation (PIE) 87-0082B recommendation # 2, each time a pump is disassembled.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The examinations shall be performed each time a RCP is disassembled.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by Design Engineering.

Regulatory Basis: There is no regulatory basis for this augmented examination.

RG 1.14 RCP FLYWHEEL: Reactor Coolant Pump Flywheel Integrity

Source Document: NRC Regulatory Guide 1.14

Commitment No.: P-16454

Associated Document: Improved Technical Specification 5.5.7.

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 multiple 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-1 Improved Technical Specification 5.5.7. These examinations are to be performed to the extent possible through the access ports in the motor housings without disassembly of the motors. The Technical Specification allows the use of acoustic emission as a substitute for the volumetric and surface examinations.

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

Frequency: All 4 RCP flywheels shall be inspected once every ISI 10-Year Interval.

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

Regulatory Basis: Improved Technical Specification 5.5.7 is loosely based on Regulatory Guide 1.14; however, ANO-1 is not committed to this Regulatory Guide.

P-16458: Visual inspections on Dry Spent Fuel Storage Casks

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

Industry Code or Standards: None

Frequency: The examinations shall be performed once per year for the external of all loaded casks. Also, a visual inspection of the internal space of the first-loaded cask once every 5 years 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.

RG 1.150: Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations

Source Document: NRC Regulatory Guide 1.150

Commitment No.: P-16449

Associated Document: ASME Section XI Code Case N-747

Purpose: Ultrasonic examinations on the Reactor Pressure Vessel (RPV) shall be conducted in accordance with U.S. Nuclear Regulatory Commission Regulatory Guide 1.150, Rev. 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations". ASME Section XI, Appendix VIII, as implemented by Performance Demonstration Initiative (PDI), satisfies the objectives of this Regulatory Guide. RPV Supplements 4, 5, 6, and 7 are being implemented in lieu of Regulatory Guide 1.150. However, Regulatory Guide 1.150 is applicable for the Flange-to-Head and Flange-to-Shell weld since an ASME Section XI Appendix VIII qualified procedure is not applied. Note that Entergy has submitted a Request for Alternative to adopt ASME Section XI Code Case N-747. If this Request for Alternative is approved by the NRC, volumetric examinations would no longer be required on the Flange-to-Head weld, in which case Regulatory Guide 1.150 would no longer be applicable for this weld.

The application of the Regulatory Guide and Appendix VIII produce a more thorough examination of the RPV welds utilizing more qualified personnel, thereby providing additional assurance of structural integrity of the RPV under all operational situations and accident scenarios.

Scope: The reactor vessel Flange-to-Head weld and Flange-to-Shell weld. Note that if the Request for Alternative described above is approved, the scope will only include the Flange-to-Shell weld.

Method: The subject welds shall be ultrasonically examined in accordance with the criteria established in Regulatory Guide 1.150.

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

Frequency: The subject welds shall be examined once every ten year interval.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by comparing the examination results to the acceptance standards established in Regulatory Guide 1.150 and ASME Section XI, IWB-3510.

Regulatory Basis: RG 1.150 has been withdrawn the commitment needs to be closed.

II. OWNER ELECTED EXAMINATIONS FOR INTERNAL COMMITMENTS

DH TIE-BACK SUPPORTS: Visual inspections on Decay Heat Vent and Drains Tie-Back Supports

Source Document: CR-ANO-1-96-0391.

Commitment No.: None

Associated Document: None

Purpose: This is based on experience with prior ANO-1 Decay Heat / RCS vibration issues. When the leak was found near valve CF-1009A, it was also reported that the tie-back restraint was missing some U-bolts and not providing any effective support. Historical information further suggested that this support had required repair previously, leading to the belief that this was a repetitive problem caused by known system vibrations (Ref: ANO IDEAS Doc. CR-1-96-0391). If no loosening is detected in this newer ANO-1 application after several inspections, inspection frequency may be adjusted.

Scope: Decay Heat tie-back supports DH-1001, DH-1450, LCP-94-5030, and DH-1037.

Method: A Visual Inspection looking for Loosening parts on the supports. Not a VT-3. No scaffolding required.

Industry Code or Standards: None

Frequency: The examinations shall be performed each outage.

Acceptance Criteria or Standard: No loose parts

Regulatory Basis: There is no regulatory basis for this augmented examination.

FO-1241 LOWER FILLET WELD: Radiographic Examination on Lower Fillet Weld on FO-1241

Source Document: Condition Report CR-1-97-0206

Commitment No.: None

Associated Document: WTANOWT-2007-0001-1904

Purpose: Industry events had identified that Oconee had loose flow orifices in the Make Up system. ANO issued Job Orders #965569 for flow orifice FO-1241 (P36A), #965519 for FO-1242 (P36B) and #965570 for FO-1243 (P36C) to radiograph the applicable lines to look for gaps in the orifices. The radiography was completed on July 3, 1997. The radiographs indicated that all three recirculation flow orifices were in place without degradation or gaps. The radiographs were reviewed again on July 17, 1997 with System Engineering, and while comparing the orifices against each other and the design drawings, it appeared that the lower fillet weld on FO-1241 (P36A) was separated where it attaches to the first baffle in the flow orifice. The indication was initially thought to be the lower edge of the baffle, but after further review was determined to be a possible crack. An alternate examination was proposed to verify the indication. An ultrasonic examination was performed on July 30, 1997 as an attempt to verify the indication and dimension its length. Due to the geometry of the weld, the ultrasonic examination was not totally definitive, but did give some indication that the fillet weld is cracked away from the lower baffle approximately 90% around the circumference. The condition was discussed with System Engineering and assessed to pose no threat to operability as the flow orifice was intact, the fillet weld at the top of the orifice is not cracked, and the lower fillet weld acts as a key to prevent movement of the orifice upstream. Immediately downstream from the orifice is an elbow and immediately upstream is a valve and reducer, essentially constraining the orifice in place.

Scope: The lower fillet weld on flow orifice FO-1241 (P36A).

Method: Radiographic examination shall be performed on the subject weld to monitor for increases in the gap between inlet orifice and the inside of the pipe, to monitor for degradation of the inlet orifice weld, and to determine if the fillet weld indication has grown.

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

Frequency: FO-1241 (P36A) shall be examined every 5 years, beginning in December, 2007.

Acceptance Criteria or Standard: Flaws or a change in conditions detected during examination shall be evaluated by Design Engineering.

Regulatory Basis: There is no regulatory basis for this augmented examination.

HPI Support Wear: Visual inspections on High Pressure Injection (HPI) Support MU-167 and Associated Piping

Source Document: Condition Report CR-ANO1-96-0502

Commitment No.: 3rd interval Commitment P-16451

Associated Document: None

Purpose: Visual inspections shall be performed on High Pressure Injection (HPI) support MU-167 and associated piping in accordance with Arkansas Nuclear One Condition Report CR-1-96-0502. This inspection is performed in order to monitor wear on the support and associated piping. The wear is a result of relative motion between the support and the piping. The results are provided to Design Engineering for their acceptance or rejection of the worn condition.

Scope: Support MU-167 and associated piping.

Method: A Visual Inspection looking for wear on the support and associated piping. Not a VT-3.

Industry Code or Standards: None.

Frequency: The examinations shall be performed each outage.

Acceptance Criteria or Standard: No increase in wear.

Regulatory Basis: There is no regulatory basis for this augmented examination.

LEVEL TAP BALANCING PLATE: Visual inspections on Balancing Plates, Hot Leg Level Taps

Source Document: CR-ANO-1-96-0391

Commitment No.: None

Associated Document: None

Purpose: This is based on experience with prior ANO-1 Decay Heat / RCS vibration issues. When the leak was found near valve CF-1009A, it was also reported that the tie-back restraint was missing some U-bolts and not providing any effective support. Historical information further suggested that this support had required repair previously, leading to the belief that this was a repetitive problem caused by known system vibrations (Ref: ANO IDEAS Doc. CR-1-96-0391). If no loosening is detected in this newer ANO-1 application after several inspections, inspection frequency may be adjusted.

Scope: Balancing plates, hot leg level taps: RC-1071 and RC-1072

Method: A Visual Inspection to verify U-bolts are tight and no missing nuts. Not a VT-3. No scaffolding required.

Industry Code or Standards: None

Frequency: The examinations shall be performed each outage.

Acceptance Criteria or Standard: No loose parts

Regulatory Basis: There is no regulatory basis for this augmented examination.

MS TIE-BACK SUPPORTS: Visual inspections on Main Steam Tie-Back Supports

Source Document: CR-ANO-2-1998-00242, CR-ANO-2-2004-01019.

Commitment No.: None

Associated Document: None

Purpose: This is recommended based on experience with a similar design found on ANO-2 Main Steam lines, which have tie back supports that loosen every 1 or 2 cycles and require rework (Ref: CR-ANO-2-1998-00242, CR-ANO-2-2004-01019). If no loosening is detected in this ANO-1 application after several inspections, inspection frequency may be adjusted.

Scope: Main Steam tie-back supports 1-MS-101-, H001, H002, and 1-MS-103-, H001, H002.

Method: A Visual Inspection looking for Loosening parts on the supports. Not a VT-3. No scaffolding required.

Industry Code or Standards: None

Frequency: The examinations shall be performed each outage.

Acceptance Criteria or Standard: No loose parts.

Regulatory Basis: There is no regulatory basis for this augmented examination.

PZR LEVEL TAP: Ultrasonic Examinations on One Pressurizer Upper Level Tap

Source Document: Calculation 86E-0074-103

Commitment No.: 3rd interval Commitment P-15790

Associated Document: ANO-92-00507 and 1CAN089302

Purpose: Inspection of this temporary repair, which was performed on the outside of the Pressurizer upper level tap. The repair of the 1-inch diameter line was performed during 1R9 and left carbon steel base material within the Pressurizer wall exposed to the steam space of the Pressurizer. Calculations performed by ANO Design Engineering demonstrated that corrosion of the Pressurizer base material within the wall would not be a concern. However, ANO-1 is continuing to perform a special ultrasonic technique to demonstrate that base-material corrosion is not occurring in the Pressurizer.

Scope: Pressurizer upper level tap temporary repair.

Method: A special ultrasonic technique to demonstrate that base-material corrosion is not occurring in the Pressurizer.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The examinations shall be performed during even outages provides a basis for deferral of a permanent repair.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by Design Engineering.

Regulatory Basis: There is no regulatory basis for this augmented examination.

PZR RELIEF VALVE PIPING: Ultrasonic Examinations on Relief Valve Piping

Source Documents: Condition Reports CR-1-92-0244 and CR-1-91-0131

Commitment No.: 3rd interval Commitment P-16460

Associated Document: None

Purpose: These examinations are a result of a cracked weld discovered in 1992 on the discharge of one of the Pressurizer safety valves. The crack was determined to be the result of chloride contamination. The source of the contamination was unknown but was suspected to be the result of a cleaning process when the valves were shipped off-site for testing.

Scope: Pressurizer relief valve piping.

Method: Ultrasonic examinations shall be performed on Pressurizer relief valve piping in accordance with ANO Condition Reports CR-1-92-0244 and CR-1-91-0131, Item 8. The examinations shall include 10% of total population once every ISI 10-Year Interval.

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

Frequency: 10% of the total population of the subject piping shall be examined once each interval.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by Design Engineering.

Regulatory Basis: There is no regulatory basis for this augmented examination.

RCP SEAL INJECTION EXAMS: Visual inspections on Reactor Coolant Pump Seal Injection Piping and Supports

Source Document: Condition Report CR-ANO1-90-0514-11

Commitment No.: 3rd interval Commitment P-16459

Associated Document: None

Purpose: Visual inspections shall be performed on Reactor Coolant Pump seal injection piping and supports in accordance with ANO Condition Report CR-1-90-0514-11. A visual inspection is performed every outage starting with 1R12 unless ANO Design Engineering/MCS changes the inspection frequency. These inspections are the result of vibrational wear damage on the supports and associated piping. This concern is similar to that contained in P-16451.

Scope: Reactor Coolant Pump seal injection piping and supports.

Method: A Visual Inspection looking for vibrational wear on the supports and associated piping. Not a VT-3.

Industry Code or Standards: None.

Frequency: The examinations shall be performed each outage.

Acceptance Criteria or Standard: No increase in wear.

Regulatory Basis: There is no regulatory basis for this augmented examination.

SG MANWAY & HANDHOLD BOLT: Visual Inspection of Steam Generator Manways and Handholes

Source Document: Letter No. 0CAN03891

Commitment No.: P-7679

Associated Document: Letter No. 0CAN069303

Purpose: The purpose of this augmented examination is to verify the integrity of the steam generators manways and handholes.

Scope: This augmented examination applies to the manways and handholes in the ANO-1 once-through steam generators.

Method: The steam generators manways and handholes shall be VT-1 visually examined.

Industry Code or Standards: ASME Code Section XI, 2001 Edition through 2003 Addenda may be used for guidance.

Frequency: The manways and handholes shall be examined once every 90 months.

Acceptance Criteria or Standard: Flaws detected during examination shall be evaluated by Design Engineering.

Regulatory Basis: There is no regulatory basis for this augmented examination.

III. LICENSE RENEWAL EXAMINATIONS FOR AGING MANAGEMENT COMMITMENTS

This section is being used to prepare for those actions required as the result of ANO Unit 1 Licensing Renewal. The actions were collected from the FSAR and multiple NRC submittals. Some of the actions require are identified others require the development of an augmented program to define what will be required. The time frame for completion of each action is divided into two time frames. So examinations must be completed prior to the license renewal period

while other examinations began with the licensing renewal period. This effort is the start of the first phase of the project necessary to prepare for the examinations. This phase is the identification or development of augmented programs. The augmented examinations are in the course of preparation and require input and changes to license commitments to ensure the right examination is performed.

Text that is shaded is different than what was stated in the License Renewal Application and therefore needs to be discussed with the License Renewal Group. Text that is bolded requires input to complete the augmented program.

ANO1-LR-1: Pressurizer Cladding Examination

Source Document: Letter No. 1CAN010003, Appendix B, Section 3.4.1

Commitment No.: A-17845

Associated Document: FSAR Section 16.1.4.1

Purpose: The pressurizer cladding examination will assess the condition of the pressurizer cladding.

Scope: The scope of this activity will include the cladding and attachment welds to the cladding of the ANO-1 pressurizer.

Aging Effects: The aging effect is cracking of cladding by thermal fatigue, which may propagate to the underlying ferritic steel.

Method: Volumetric examination of the pressurizer items that are most susceptible to thermal fatigue will provide assurance that cracking of cladding has not extended into the base metal of the pressurizer. Pressurizer items with the highest cumulative usage factor include the circumferential weld that connects the shell to the lower head and the full penetration weld that connects the pressurizer surge nozzle to the lower head.

In accordance with ASME Section XI, Examination Category B-B, volumetric examination of the circumferential shell-to-head weld is performed each inspection interval. In addition, 1 ft of the longitudinal weld adjacent to the heater belt forging is volumetrically examined. The weld that connects the surge nozzle to the lower head receives volumetric examination each inspection interval in accordance with Examination Category B-D. Continuation of these inspections during the period of extended operation will manage any cracking of cladding that may extend into the base metal at the locations that are most susceptible to thermal fatigue.

Sample Size: The pressurizer design report was reviewed and the stainless steel clad carbon steel items with the highest cumulative usage factors include the circumferential weld that connects the shell to the lower head and the weld that connects the surge nozzle to the lower head. Inspection of these items will bound the remaining stainless steel clad carbon steel items in the pressurizer.

Industry Code or Standards: ASME Section XI, 2001 Edition through 2003 Addenda, including mandatory Appendices VII and VIII (Appendix VIII in accordance with 10 CFR 50.55a).

Frequency: The examination frequency is defined by ASME Section XI, Table IWB-2500-1, Examination Categories B-B and B-D.

Acceptance Criteria or Standard: Acceptance standards for volumetric examination in accordance with ASME Section XI, IWB-3510 and IWB-3512.

Timing of New Program or Activity: The inspections discussed above are included in the current ANO-1 ISI program and will be carried forward to the period of extended operation.

Demonstration: As a result of pressurizer cladding cracking that occurred at Haddam Neck, cracking of cladding in the pressurizer was evaluated as a potential aging effect requiring aging management. The concern is that cracks in the cladding may extend into the underlying ferritic steel and subsequent growth of the crack may propagate and remain undetected. Based on differences in design, fabrication, and operation, cladding cracking and propagating into the ferritic base material in the ANO-1 pressurizer is not expected.

The Pressurizer Cladding Examination includes multiple volumetric examinations of pressurizer items having the highest fatigue usage factors. Any cracking of the cladding that extends into the base metal would be detected by ASME Section XI volumetric examinations at these locations. The multiple volumetric inspections being performed in accordance with ASME Section XI requirements conservatively envelope the one time inspection recommended in the SER in BAW-2244A. The Pressurizer Cladding Examination will provide reasonable assurance that the aging effects associated with the cladding and ferritic base material will be managed such that the applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-2: Pressurizer Heater Bundle Penetration Welds Examination

Source Document: Letter No. 1CAN010003, Appendix B, Section 3.4.2

Commitment No.: A-17845

Associated Document: FSAR Section 16.1.4.2

Purpose: The pressurizer heater bundle penetration welds examination will assess the condition of the pressurizer heater penetration welds.

Scope: This examination will be applicable to the heater sheath-to-diaphragm plate penetration welds inside the pressurizer. The pressurizer contains three heater bundles.

Aging Effects: The aging effect is cracking at the heater bundle penetration welds, which may lead to reactor coolant leakage.

Method: For the first heater bundle that is removed for replacement, a surface examination of sixteen peripheral welds will be performed. A visual examination (VT-3 or equivalent) of the remaining welds of the heater bundle will be performed.

In addition, ANO-1 inspects the exterior portions of the heater bundle each outage in accordance with Examination Category B-P of ASME Section XI. In accordance with IWA-5242 for bolted connections, ANO-1 will remove the insulation surrounding the penetrations and perform a VT-1 inspection. This addresses Open Item 2 in the NRC SER of BAW-2244A.

Sample Size: The examination will include sixteen peripheral heater penetration welds on one heater bundle. However, if the surface examination of the Oconee heater bundle penetration welds is performed before the ANO-1 bundle removal and indicates that cracking of the welds is not an aging effect, the heater bundle penetration welds at ANO-1 will not be inspected. The Oconee (Units 2 and 3) and ANO-1 heater bundle designs are identical, and inspection of the Oconee Unit 1 welds would bound ANO-1 since the Oconee Unit 1 welds are fabricated from Alloy 82/182 [BAW-2244A].

Industry Code or Standards: ASME Section XI, 2001 Edition through 2003 Addenda, including mandatory Appendices VII and VIII (Appendix VIII in accordance with 10 CFR 50.55a).

Frequency: Pressurizer heater bundle penetration welds examination is a one-time inspection. If the results of the inspection are not acceptable, then the results may be used as a baseline inspection for establishing further programmatic actions covering the other two ANO-1 heater bundles.

Acceptance Criteria or Standard: Acceptance standards for surface examinations and visual examination (VT-3) will be in accordance with ASME Section XI.

Timing of New Program or Activity: The heater bundle examination may occur prior to entering the period of extended operation or during the period of extended operation. If the Oconee inspection occurs prior to the ANO-1 bundle removal and indicates that cracking of the heater penetration welds is an aging effect, the examination will be performed upon removal of an ANO-1 pressurizer heater bundle.

Operating Experience and Demonstration: No stainless steel heater sheath-to-diaphragm plate penetration welds have cracked to date on a B&W plant. Failures have occurred at other non-B&W plants on similar heater penetrations. However, these failures occurred on more susceptible Alloy-600 penetrations through hemispherical heads. The ANO-1 heaters are welded to a flat plate. Cracking is not expected on the ANO-1 pressurizer heaters during the period of extended operation. If through-wall cracking occurs, the resulting leakage will be detected by Leakage Detection in Reactor Building or ASME Section XI-IWB Inspection Programs. Because of the design of the heater sheath assembly, if leakage occurs, it will not be a safety concern. The mechanical design of the heater will limit leakage and provide adequate structural support even with a failure of the sheath-to-diaphragm welds. If a heater bundle is removed for replacement, surface examinations of the 16 peripheral heater penetrations and VT-3 or equivalent examinations of the remaining welds of the heater bundle will determine if cracking of these welds is an applicable aging effect. This will provide reasonable assurance that the aging effects associated with stainless steel heater penetration welds will be managed such that the applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-3: ASME Section XI, Subsection IWB Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.1

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.1

Purpose: The purpose of the ASME Section XI, Subsection IWB Inspections under the scope of the ANO-1 Inservice Inspection Plan is to identify and correct degradation of ASME Class 1 pressure retaining components and their integral attachments in accordance with 10 CFR 50.55a and ANO-1 Technical Specification 4.0.5.

Scope: The scope of the ASME Section XI, Subsection IWB Inspections, credited for license renewal, is identified specifically for each component and for applicable component features in Table 3.2-1 in the License Renewal Application (Letter No. 1CAN010003). Items listed in Table 3.2-1 selected for ISI at ANO-1 are consistent with the items contained in ASME Section XI, Table IWB-2500-1, with the exception of RCS piping and approved alternatives.

ASME Section XI requires a VT-3 visual examination of the internal surfaces whenever a pump is disassembled for maintenance, repair or volumetric examination. If an RCP has not been disassembled for maintenance, repair or volumetric examination, ANO-1 will disassemble an RCP and do a VT-3 visual inspection of the internal surface of one pump casing before entering the period of extended operations.

ANO-1 has implemented a risk-informed methodology to select RCS piping welds for inspection in lieu of the requirements specified in the 2001 Edition through 2003 Addenda of ASME Section XI, Table IWB-2500-1, Examination Category B-J. The risk-informed approach is based on Code Case N-716 and consists of the following two essential elements: (1) a degradation mechanism evaluation is performed to assess the failure potential of the piping system under consideration, and (2) a consequence evaluation is performed to assess the impact on plant safety in the event of a flooding event.

The risk-informed process used to select piping elements for inspection is consistent with the method used to identify applicable aging effects in BAW-2243A for stainless steel piping, Alloy-600 branch connections and piping, and clad carbon steel piping. Therefore, the risk-informed method that supersedes the current Examination Category B-J requirements is appropriate for the period of extended operation and adequately addresses the applicable aging effect of cracking at welded joints for clad carbon steel and stainless steel piping. See the ANO-1 program entitled "Small Bore Piping and Small Bore Nozzles Inspections," for a discussion of the application of risk-based inspection to small bore piping (i.e., NPS less than 4 inches) and small bore nozzles. Aging management for Alloy-600 items is addressed by the ANO-1 program entitled "Alloy-600 Aging Management Program."

Aging Effects: The aging effects managed as part of the ASME Section XI, Subsection IWB Inspections include cracking, loss of mechanical closure integrity at bolted connections, and loss of material.

Method: Detection of flaws is performed using nondestructive examination techniques. Three different types of examinations are performed: volumetric, surface, and visual examinations. Volumetric examinations are the most extensive, using methods such as radiographic, ultrasonic or eddy current examinations to locate surface and subsurface flaws. Surface examinations use methodologies such as magnetic particle or dye penetrant testing to locate surface flaws.

Three levels of visual examinations are specified. The VT-1 visual examination is conducted to assess the condition of the surface of the part being examined, looking for cracks, symptoms of wear, corrosion, erosion or physical damage. It can be done with either direct visual observation or with remote examination using various optical/video devices. The VT-2 examination is conducted specifically to locate evidence of leakage from pressure retaining components (period pressure tests). While the system is under pressure for a leakage test, visual examinations are conducted to detect direct or indirect indication of leakage. The VT-3 examination is conducted to determine the general mechanical and structural condition of components and supports and to detect discontinuities and imperfections such as loss of integrity at bolted connections.

Industry Code or Standards: The ASME B&PV Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program. For examination category B-J, the risk-informed approach is based on Code Case N-716.

Frequency: The frequency of inspections is specified in ASME Section XI Tables IWB-2500-1 for applicable examination categories identified in Table 3.2-1 in Letter No. 1CAN010003. The inspection intervals are not restricted by the Code to the current term of operation and are valid for any period of extended operation.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Tables IWB-2500-1 for all applicable examination categories identified in Table 3.2-1 in Letter No. 1CAN010003.

Timing of New Program or Activity: An RCP will be disassembled and inspected prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME Section XI Code. ANO-1 Technical Specification 4.0.5 specifically requires ISI per the ASME Section XI Code. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1,* also provides a regulatory basis for this program.

Operating Experience and Demonstration: The IWB inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repairs or replacement are accomplished in accordance with ASME Section XI standards. The continued implementation of the IWB Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-4: ASME Section XI, Subsection IWC Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.2

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.2

Purpose: The purpose of the ASME Section XI, Subsection IWC inspections is to identify and correct degradation of ASME Class 2 pressure retaining components and their integral attachments in accordance with 10 CFR 50.55a and ANO-1 Technical Specification 4.0.5.

Scope: The scope of the ASME Section XI, Subsection IWC Inspections, credited for license renewal, includes inspection of selected components in the following systems.

- Core Flood
- Reactor Building Spray
- Main Feedwater
- Spent Fuel
- Service Water
- High Pressure Injection/Makeup and Purification
- Low Pressure Injection/Decay Heat
- Emergency Feedwater
- Main Steam
- Reactor Building Isolation
- Chilled Water System

Aging Effects: The aging effects that are managed as part of the ASME Section XI, Subsection IWC Inspections include cracking, loss of mechanical closure integrity, and loss of material.

Method: Detection of flaws is performed using nondestructive examination techniques. Three different types of examinations performed are volumetric, surface, and visual examinations. Volumetric examinations consist of radiographic, ultrasonic or eddy current examinations performed to locate surface and subsurface flaws. Surface examinations use methodologies such as magnetic particle or dye penetrant testing to locate surface flaws.

Three levels of visual examinations are specified. The VT-1 visual examination is conducted to assess the condition of the surface of the part being examined, looking for cracks, symptoms of wear, corrosion, erosion or physical damage. It can be done with either direct visual observation or with remote examination using various optical/video devices. The VT-2 examination is conducted specifically to locate evidence of leakage from pressure retaining components (period pressure tests). While the system is under pressure for a leakage test, visual examinations are conducted to detect direct or indirect indication of leakage. The VT-3 examination is conducted to determine the general mechanical and structural condition of components and supports and to detect discontinuities and imperfections.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency of inspections is specified in ASME Section XI Table IWC-2500-1. The inspection intervals are not restricted by the Code to the current term of operation and are valid for any period of extended operation.

Acceptance Criteria or Standard**:** Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWC.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME Code Section XI. ANO-1 Technical Specification 4.0.5 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: The IWC inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repair and replacement are accomplished in accordance with ASME Section XI standards. The continued implementation of the IWC Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-5: ASME Section XI, Subsection IWD Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.3

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.3

Purpose: The purpose of the ASME Section XI, Subsection IWD Inspections is to identify and correct degradation of ASME Class 3 pressure-retaining components and their integral attachments in accordance with 10 CFR 50.55a and ANO-1 Technical Specification 4.0.5.

Scope: The scope of the ASME Section XI, Subsection IWD Inspections, credited for license renewal includes inspections of selected components in the following systems.

- Service Water
- Spent Fuel
- Main Steam
- Emergency Feedwater
- Sodium Hydroxide
- Condensate Storage

Aging Effects: The aging effects that are managed as part of the ASME Section XI, Subsection IWD Inspections include cracking, loss of mechanical closure integrity, and loss of material.

Method: Detection of flaws is performed using visual inspection techniques. Two levels of visual examinations are specified. The VT-2 examination is conducted specifically to locate evidence of leakage from pressure retaining components (period pressure tests). While the system is under pressure for a leakage test, visual examinations are conducted to detect direct or indirect indication of leakage. The VT-3 examination is conducted to determine the general mechanical and structural condition of components and supports and to detect discontinuities and imperfections.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency of inspections is specified in ASME Section XI Table IWD-2500-1. The inspection intervals are not restricted by the Code to the current term of operation and are valid for any period of extended operation.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWD.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.0.5 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: The IWD inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repair and replacement are accomplished in accordance with ASME Section XI standards. The continued implementation of the IWD Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-6: ASME Section XI, Subsection IWE Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.4

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.4

Purpose: The purpose of the ASME Section XI, Subsection IWE Inspections is to identify and correct degradation of Class MC pressure retaining components and their integral attachments, and of metallic shell and penetration liners of Class CC pressure retaining components and their integral attachments in accordance with 10 CFR 50.55a.

Scope: The scope of the ASME Section XI, Subsection IWE Inspections, credited for license renewal includes inspections of the reactor building liner plate.

Aging Effects: The aging effect managed as part of the ASME Section XI, Subsection IWE Inspections is a loss of material of the steel surfaces.

Method: Detection of flaws is performed using nondestructive examination techniques. Three different types of examinations performed are volumetric, surface, and visual examinations. Volumetric examinations consist of radiographic and ultrasonic examinations. Surface examinations use methodologies such as magnetic particle or dye penetrant testing to locate surface flaws.

Two levels of visual examinations are specified. The VT-1 visual examination is conducted to assess the condition of the surface of the part being examined, looking for cracks, symptoms of wear, corrosion, erosion or physical damage. It can be done with either direct visual observation or with remote examination using various optical/video devices. The VT-3 examination is conducted to determine the general mechanical and structural condition of components and supports and to detect discontinuities and imperfections.

NOTE: If the License Renewal Group decides to reference the 2001 Edition through 2003 Addenda of ASME Section XI, they also need to update the “Methods” section written above. The 2001 Edition through 2003 Addenda does not stipulate surface examinations or radiographic examinations. In addition, VT-1 and VT-3 visual examinations have been replaced by “General Visual” and “Detailed Visual” examinations.

Industry Code or Standards: The ASME B&PV Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency of inspections is specified in ASME Section XI Table IWE-2500-1. The inspection intervals are not restricted by the Code to the current term of operation and are valid for any period of extended operation.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWE.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: The IWE inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repair and replacement are accomplished in accordance with

ASME Section XI standards. The continued implementation of the IWE Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-7: ASME Section XI, Subsection IWF Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.5

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.5

Purpose: The purpose of the ASME Section XI Inservice Inspection Program, IWF Inspections is to identify and correct degradation of ASME Class 1, 2, 3, or MC component supports in accordance with 10CFR50.55a and ANO-1 Technical Specification 4.0.5.

Scope: The scope of the ASME Section XI, Subsection IWF Inspections, credited for license renewal includes component supports for ASME Class 1, 2, 3, or MC components.

Aging Effects: The aging effects managed as part of ASME Section XI, Subsection IWF include cracking, loss of material, and change in material properties.

Method: Visual examinations (i.e., VT-3) are conducted to determine the general mechanical and structural condition of component supports within the scope as defined for the applicable component support type in ASME Section XI Table IWF-2500-1.

Industry Code or Standards: The ASME Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency of inspections is specified in ASME Section XI Tables IWF-2500-1. The inspection intervals are not restricted by the Code to the current term of operation and are valid for any period of extended operation.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI, Subsection IWF-3400.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.0.5 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: The IWF inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repair and replacement are accomplished in accordance with ASME Section XI standards. The continued implementation of the IWF Inspections provides

reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-8: ASME Section XI, Subsection IWL Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.6

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.6

Purpose: To provide instructions and documentation requirements for assessing the quality and structural performance of the reactor building's post-tensioning systems and concrete surfaces.

Scope: IWL inspections are performed on the reactor building's post-tensioning systems and concrete components that are subject to an aging management review as identified in Sections 2.4 and 3.6 of the ANO-1 License Renewal Application. Items exempt from the examination requirements include inaccessible tendon end anchors and concrete surfaces.

Aging Effects: The aging effects requiring management are loss of material for tendon anchorage and cracking and change in material properties for concrete.

Method: ASME Code Section XI, Subsection IWL provides the rules and requirements for inservice examination, inservice inspection and repair of the reinforced concrete and the post-tensioning systems of Class CC components. Such inspections are performed since degradation could lead to a crack or break in tendon wires or anchorage, thereby rendering the tendon unable to maintain compressive force on the reactor building structure during an accident.

Industry Codes or Standards**:** ASME Code Section XI, Subsection IWL, 2001 Edition through 2003 Addenda provides requirements for inservice inspection and repair or replacement activities of the post-tensioning systems of concrete reactor building.

Frequency: Tendon surveillance is currently performed at 5-year intervals. Concrete surface examinations are conducted within a year of tendon surveillance.

Acceptance Criteria of Standard: Acceptance standards are specified in IWL-3000.

Regulatory Basis: 10 CFR 50.55a and technical specifications.

Operating Experience and Demonstration: During the twentieth year in-service inspection performed in the latter part of 1993, signs of degradation included an observable quantity of water in one of the tendons, corrosion on a shim at the end of one tendon, and one tendon found to have slightly low ultimate strength. The corroded shim was replaced. Metallurgical analysis found that the slightly low tensile strength was an original condition from the wire mill. The surveillance findings indicated that the tendons are experiencing normal relaxation. This experience demonstrates that the IWL inspections are effective in identifying indications of

potential aging effects. In addition, the tendon surveillance and concrete inspections are performed in accordance with Subsection IWL of the ASME Code. Continued implementation of this program provides reasonable assurance that aging effects will be managed so that the reactor building post-tensioning system will continue to perform its intended function in accordance with the current licensing basis during the period of extended operation.

ANO1-LR-9: Augmented Examinations - Examination of Non-Classed Main Feedwater and Main Steam Piping Welds in Support of High Energy Line Break Analysis

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify the augmented examination of non-classed main feedwater and main steam piping welds in support of the high energy line break analysis. Is this license renewal commitment met by the existing commitment to examine these welds per NUREG-0800, Section 3.6.2 and ANO Upper Level Document ULD-0-TOP-07 as discussed in Appendix A: Augmented Examination No. P-16450 in this document.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: The methods used for these augmented examinations are addressed in Appendix A: Augmented Examination No. P-16450 in this document.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency used for these augmented examinations are addressed in Appendix A: Augmented Examination No. P-16450 in this document.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-10: Augmented Examinations - Examination of BWST Header Including Lines from the Reactor Building Sump

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify the augmented examination of the borated water storage tank (BWST) header including lines from the reactor building sump. This license renewal commitment is met by the existing commitment to examine these welds per NRC IE Bulletin 79-17 as discussed in Appendix A: Augmented Examination No. P-16452 in this document.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: The methods used for these augmented examinations are addressed in Appendix A: Augmented Examination No. P-16452 in this document.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: The frequency used for these augmented examinations are addressed in Appendix A: Augmented Examination No. P-16452 in this document.

Acceptance Criteria or Standard: Flaws detected during examination are evaluated by comparing the examination results to the acceptance standards established in ASME Section XI.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-11: Augmented Examinations - Examination of the Piping Welds Wetted by the Reactor Building Sump Water

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify special augmented inspections on the welds of the piping wetted by the reactor building sump water. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-12: Augmented Examinations - Supplemental Examination of the "Q" Stainless Steel Piping of the Main Steam System

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify supplemental augmented examination of the "Q" stainless steel piping of the main steam system. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-13: Augmented Examinations - Examination of the Penetration 68 Piping and Components and the Decay Heat Pump Room Drain Valves

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify augmented examination of the Penetration 68 piping and components and the decay room pump room drain valves. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-14: Augmented Examinations - Examination of Penetrations 10, 47, 58 and 64

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.7

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: ANO-1 License Renewal Application Letter No. 1CAN010003, Appendix B, Section 4.3.7 and FSAR Section 4.3.7 identify augmented examination of Penetrations 10, 47, 58 and 64. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-15: Augmented Examinations - Visual Examination of Pressure Retaining Surfaces of One Reactor Coolant Pump

Source Document: This commitment is listed in FSAR Section 16.2.3.7, but is not addressed in Letter No. 1CAN010003, Appendix B, Section 4.3.7. As such, there is no "source document" beyond a listing in the FSAR.

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: FSAR Section 4.3.7 identifies the augmented visual examination of pressure retaining surfaces of one reactor coolant pump.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-16: Augmented Examinations - Volumetric/Non-Destructive Examination of Sodium Hydroxide System Stainless Steel Tubing and Valves

Source Document: This commitment is listed in FSAR Section 16.2.3.7, but is not addressed in Letter No. 1CAN010003, Appendix B, Section 4.3.7. As such, there is no "source document" beyond a listing in the FSAR.

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: FSAR Section 4.3.7 identifies the augmented volumetric/non-destructive examination of sodium hydroxide system stainless steel tubing and valves. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-17: Augmented Examinations - Volumetric/Non-Destructive Examination of Chilled Water System Stainless Steel Tubing and Valves

Source Document: This commitment is listed in FSAR Section 16.2.3.7, but is not addressed in Letter No. 1CAN010003, Appendix B, Section 4.3.7. As such, there is no "source document" beyond a listing in the FSAR.

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.7

Purpose: The purpose of the ASME Section XI, Augmented Inspections is to identify and correct degradation of components outside of the jurisdiction of ASME Section XI.

Scope: FSAR Section 4.3.7 identifies the augmented volumetric/non-destructive examination of chilled water system stainless steel tubing and valves. The action scope needs to be identified.

Aging Effects: The aging effects managed by these inspections are cracking and a loss of material.

Method: An examination method for this augmented examination needs to be determined.

Industry Code or Standards: The ASME Code Section XI, 2001 Edition through 2003 Addenda was used to develop this program.

Frequency: An examination frequency for this augmented examination needs to be determined.

Acceptance Criteria or Standard: The acceptance standards to be used for this augmented examination needs to be determined.

Timing of New Program or Activity: The new inspections will be initiated prior to the end of the initial 40-year license term for ANO-1.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.15 specifically requires ISI per the ASME B&PV Code, Section XI. NRC Reg. Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, also provides a regulatory basis for this program.

Operating Experience and Demonstration: Augmented Inspections use the same nondestructive examination methods that are used for Section XI inspections on Class 1, 2, and 3 structures and components. These methods have proven effective in the industry for identifying cracking and loss of material. The continued implementation of the Augmented Inspections provides reasonable assurance that the aging effects will be managed so that the applicable structures and components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

ANO1-LR-18: Small Bore Piping and Small Bore Nozzles Inspections

Source Document: Letter No. 1CAN010003, Appendix B, Section 4.3.8

Commitment No.: A-17845

Associated Document: FSAR Section 16.2.3.8

Purpose: The Small Bore Piping and Small Bore Nozzles Inspections identify aging effects on small bore piping and nozzles.

Scope: The small bore piping and small bore nozzles, within the scope of this program, are defined as reactor coolant system piping and nozzles less than 4-inch NPS that do not receive volumetric inspection in accordance with ASME Section XI. Alloy-600 small bore branch connections, small bore safe ends, and small bore nozzles are addressed by the Alloy-600 Aging Management Program.

Aging Effect: BAW-2243A and BAW-2244A identify cracking as an aging effect for small bore piping and small bore nozzles.

Method: Section 4.4.2 of BAW-2243A states that additional inspections of small bore piping may be appropriate to assure the management of potential weld cracking for the period of extended operation. Selection of additional inspection locations should be based on detailed evaluations of material susceptibility, operating environment, stress, and risk.

ANO-1 has implemented a risk-informed method to select RCS piping welds for inspection in lieu of the requirements specified in the 1992 Edition of ASME Section XI, Table IWB-2500-1, Examination Category B-J. The risk-informed approach is based on Code Case N-716 and consists of two essential elements: (1) a degradation mechanism evaluation to assess the failure potential of the piping system under consideration, and (2) a consequence evaluation to assess the impact on plant safety in the event of a piping failure.

The results from these two independent evaluations are coupled to determine the risk significance of piping segments within the system. Priority is then given to the most risk significant piping segments during the selection of RCS piping welds for inspection.

As part of the risk-informed ISI program, ANO-1 has selected for volumetric examinations, a sample population of welds in the following Class 1 small bore piping: 1½-inch pressurizer spray line, 2½-inch makeup and purification lines, 2½-inch letdown line, and 1½-inch cold leg suction drain line.

Industry Codes or Standards: ASME Code Case N-716 is the industry code used to develop this program.

Frequency: The inspection frequencies are defined in Table 1 of ASME Code Case N-716.

Acceptance Criteria or Standard: Acceptance criteria are provided in ASME Section XI IWB-3400 and IWB-3132 as provided in ASME Code Case N-716.

Regulatory Basis: The regulatory basis for the inservice inspection program is 10 CFR 50.55a(g), which specifically requires ISI be performed per ASME B&PV Code Section XI. ANO-1 Technical Specification 4.0.5 also provides a regulatory basis for this program.

Operating Experience and Demonstration: Following the discovery of a cracked weld in an RCS drain line in 1989, ANO-1 implemented a program to investigate the potential for cracking of other similar lines. The root cause of the cracking was determined to be a weld defect that propagated by vibrational fatigue. A document search for records of small bore pipe failures for the past 10 years at ANO-1 revealed no piping failures caused by thermal fatigue.

Vibration induced socket weld failures at ANO have occurred, almost exclusively, on small bore (2-inch NPS and under) vents and drains. Engineering personnel performed a comprehensive root cause analysis and developed a corrective action plan for the prevention of ANO-1 piping vibration failures. Several socket welds at locations of high vibration loads were reinforced. Plant changes that may introduce new vibration sources or new vents or drains are thoroughly evaluated before implementation. At ANO-1, failures of ASME Class 1 small bore pipe have been rare.

The ANO-1 risk-informed method for selecting welds for inspection incorporates the elements necessary to manage cracking of small bore piping and small bore nozzles during the period of extended operation. The inspections are implemented in accordance with NRC approved versions of ASME Section XI using proven techniques and methods to detect and evaluate flaws. Repair or replacement is accomplished in accordance with ASME Section XI standards. The continued implementation of this program provides reasonable assurance that the aging effects will be managed so that the applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.