Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

April 22 2016

10 CFR 50.55a

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2
Facility Operating License No. NPF-96
NRC Docket No. 50-391

Subject: **Watts Bar Nuclear Plant Unit 2 - American Society of Mechanical Engineers Section XI First 10-Year Interval Inservice Inspection Program**

References:

1. Tennessee Valley Authority (TVA) letter to the Nuclear Regulatory Commission (NRC), "Watts Bar Nuclear Plant (WBN) - Unit 2 - Regulatory Framework for the Completion of Construction and Licensing Activities for Unit 2," dated January 29, 2008 (ML080320443)

2. NRC letter to TVA, "Issuance of Facility Operating License No. NPF-96, Watts Bar Nuclear Plant Unit 2," dated October 22, 2015 (ML15251A587)

3. TVA letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Transition - Revised Commitment," dated September 1, 2011 (ML11306A022)

4. TVA Letter to NRC ,"Watts Bar Nuclear Plant (WBN) Units 1 and 2 – Updated Inservice Test (IST) Program (Unit 1) and IST/Preservice Test (PST) Program (Unit 2), dated December 12, 2013 (ML13358A066)

5. TVA letter to NRC, "Watts Bar Nuclear Plant Units 1 and 2 - Request for Approval of an Alternative to the Inservice Examination Requirements of American Society of Mechanical Engineers (ASME) Section XI Examination Methodology - Number WBN-1 & -2/PDI-4," dated April 22, 2016

The purpose of this letter is to submit to the Nuclear Regulatory Commission (NRC) the Watts Bar Nuclear Plant (WBN) Unit 2 American Society of Mechanical Engineers (ASME)

Boiler and Pressure Vessel (B&PV) Code Section XI Inservice Inspection (ISI) Program. In Reference 1, the Tennessee Valley Authority (TVA) committed to submit the WBN Unit 2 ISI Program to the NRC within six months after receiving the WBN Unit 2 operating license (OL). In Reference 2, the NRC issued the WBN Unit 2 OL on October 22, 2015. Therefore, the due date for submitting the WBN Unit 2 ISI Program to the NRC is April 22, 2016. In addition, TVA committed to submit the Inservice Testing Program and the ISI Program separately in Reference 3. The WBN IST Programs were submitted in Reference 4.

The WBN ISI Program consists of the following documents:

- WBN Unit 2 Technical Requirements Instruction (TRI) 2-TRI-0-10.1, "ASME Section XI ISI/NDE Program," Revision 0 (Enclosure 1).

- WBN Unit 2 Surveillance Instruction (SI) 2-SI-68-907, "Steam Generator Tubing Inservice Inspection and Augmented Inspections," Revision 1 (Enclosure 2). This instruction contains the program details and requirements for performing the first 10-year inservice inspections of steam generator (SG) tubing for WBN Unit 2. The SG Program is an integrated program that includes implementation of requirements for ASME Section XI and the WBN Unit 2 Technical Specifications.

The code of record for the first 10-year ISI interval for WBN Unit 2 is the ASME, Section XI, Division 1, 2007 Edition, 2008 Addenda in accordance with Title 10 *Code of Federal Regulations* (10 CFR) 50.55a(g)(4)(i). The WBN Unit 2 first 10-year interval will begin at commercial operation, which is currently scheduled for June 2016.

Appendix J to Enclosure 1, contains alternative request PDI-4 for WBN Units 1 and 2 that has been submitted separately for NRC review and approval in Reference 5.

There are no new regulatory commitments associated with this submittal. Please address any questions regarding this response to Gordon Arent at 423-365-2004.

Respectfully,

Paul Simmons
Site Vice President
Watts Bar Nuclear Plant

Enclosures:

1. Watts Bar Nuclear Plant Unit 2 Technical Requirements Instruction 2-TRI-0-10.1, "ASME Section XI ISI/NDE Program," Revision 0

2. Watts Bar Nuclear Plant Unit 2 Surveillance Instruction, "2-SI-68-907, Steam Generator Tubing Inservice inspection and Augmented Inspections," Revision 1

cc (Enclosures):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Unit 1
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Unit 2
NRR Project Manager - Watts Bar Nuclear Plant

Enclosure 1

Watts Bar Nuclear Plant Unit 2
Technical Requirements Instruction 2-TRI-0-10.1
ASME Section XI ISI/NDE Program
Revision 0

Watts Bar Nuclear Plant

Unit 2

Technical Requirements Instruction

2-TRI-0-10.1

ASME SECTION XI ISI/NDE PROGRAM

Revision 0000

Quality Related

Level of Use: Information Use

Effective Date: 04-07-2016

Responsible Organization: PGM, Engineering Program Group

Prepared By: Eben Burns

Approved By: Cindy Abidi

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0	04/07/16	All	Initial Issue

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1.0 INTRODUCTION

1.1 Purpose

In accordance with Title 10 Code of Federal Regulations (CFR) Part 50.55a(g), this program implements the Watts Bar Nuclear Plant (WBN) Unit 2 Technical Surveillance Requirement 3.4.5.2 and fulfills the requirements of NPG-SPP-09.1, ASME Code and Augmented Programs, Part A, Section XI Inservice Inspection and Augmented Nondestructive Examinations. This program is organized to comply with the inservice inspection (ISI) nondestructive examination (NDE) requirements of the 2007 Edition, 2008 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Division 1, Articles 1000, 2000, 3000, and 6000 as modified by ASME Code Section XI Code Case N-716-1, Alternative Classification and Examination, for Risk-Informed ISI. This program implements the conditions imposed by the NRC in 10CFR50.55a on ISI, ASME Section XI, and various ASME Code Cases.

This ISI/NDE Program is an administrative Technical Requirement Instruction (TRI) employed to obtain data via NDE of ASME Section XI Code Class 1, 2, 3, and non-Code equivalent components and areas to determine acceptance of components for continued service during operation and to determine if a flaw is an isolated case or of a generic nature. It shall serve as TVA's ISI/NDE plan and schedule in accordance with the requirements of IWA-1400 for the WBN Unit 2 First ISI Interval.

This ISI/NDE Program reflects the built-in limitations of the original plant design, geometry, construction, component materials, and the current technology or state-of-the-art nondestructive examination techniques. It specifies the number of components to be examined, the examination methods to be used and provides schedule tables from which specific items are scheduled for examination. These items are described and detailed in ISI scan plans which are issued for each refueling outage.

1.2 Scope (Applicability)

This program outlines details for planning and implementing the first ISI/NDE inspection interval for ASME Section XI Code Class 1, 2, 3, and non-Code equivalent components and areas at WBN Unit 2 in accordance with IWA-2431, Inspection Program. With the implementation of ASME Code Case N-716-1 for Risk-Informed ISI, some non-Code piping areas have been identified as High Safety Significant (HSS) due to flooding concerns and have been added to the ISI Program. ASME Code Case N-716-1 also requires a Preservice Inspection of HSS components following Repair/Replacement Activities.

1.2 Scope (Applicability) (continued)

Other elements of ASME Section XI and ASME OM Code, such as Pump and Valve Testing, Snubber Inservice Examination and Testing, Repairs and Replacements, System Pressure Tests (including the associated Categories B-P, C-H, D-B, VT-2 Visual Examinations), and Steam Generator Tube Examinations (Category B-Q) are covered by other programs and procedures. The Containment ISI Program for Category IWE is addressed in 2-TI-100.012.

The TVA Flow Diagrams and the ISI Drawings are used to identify the components and systems to be examined (see Appendix G for listing).

IWB-1220 describes the Code Class 1 components exempt from volumetric and surface examination. Applicable exemptions are as follows.

A. Reactor coolant pressure boundary components and piping segments less than or equal to nominal pipe size (NPS) 1, except for Steam Generator tubes (which are not addressed by this ISI Program).

B. Components and piping segments which have one inlet and one outlet, both of which are NPS 1 or smaller.

C. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 1 pipe.

D. Reactor Vessel Head connections and associated piping 2” nominal pipe size (NPS) and smaller, made inaccessible by control rod drive penetrations.

E. Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe.

IWC-1221 and IWC-1223 describe the Code Class 2 components in Residual Heat Removal (RHR), Emergency Core Cooling (ECC), and Containment Heat Removal (CHR) systems exempt from volumetric and surface examinations. Applicable exemptions are as follows.

A. For RHR, ECC, and CHR systems, except High Pressure Safety Injection, components and piping segments NPS 4 and smaller. Components and piping segments which have one inlet and one outlet, both of which are NPS 4 or smaller. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 4 pipe.

1.2 Scope (Applicability) (continued)

B. For the High Pressure Safety Injection system, piping, vessels, pumps, valves and their piping connections NPS 1-1/2 and smaller. Components and piping segments which have one inlet and one outlet, both of which are NPS 1-1/2 or smaller. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 1-1/2 pipe. Since WBN-2 is implementing Risk-Informed ISI per ASME Code Case N-716-1, the Class 2 HPSI requirements are not applicable for this Interval. The inspection requirements for Class 2 HPSI are replaced by requirements in Risk-Informed Category R-A.

C. Vessels, piping, pumps, valves, other components, and component connections of any size in statically-pressurized, passive (i.e., no pumps) safety injection systems. This applies to the 4 Cold Leg Accumulators (CLAs).

D. Piping and other components of any size beyond the last shutoff valve in open-ended portions of systems that do not contain water during normal operating conditions.

E. Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe.

IWC-1222 and IWC-1223 describe the Code Class 2 components in systems other than RHR, ECC, and CHR systems exempt from volumetric and surface examinations, as follows.

A. For systems except Auxiliary Feedwater, components and piping segments NPS 4 and less. Components and piping segments which have one inlet and one outlet, both of which are NPS 4 or smaller. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 4 pipe.

B. For Auxiliary Feedwater, components and piping segments NPS 1-1/2 and less. Components and piping segments which have one inlet and one outlet, both of which are NPS 1-1/2 or smaller. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 1-1/2 pipe. Since WBN-2 is implementing Risk-Informed ISI per ASME Code Case N-716-1, the Class 2 AFW requirements are not applicable for this Interval. The inspection requirements for Class 2 AFW are contained in Category R-A.

1.2 Scope (Applicability) (continued)

C. Vessels, piping, pumps, valves, other components, and component connections of any size in systems that operate (when the system function is required) at a pressure equal to or less than 275 psig and at a temperature equal to or less than 200 F.

D. Piping and other components of any size beyond the last shutoff valve in open-ended portions of systems that do not contain water during normal operating conditions.

E. Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe.

IWD-1220 describes the Code Class 3 components exempt from the VT-1 visual examination requirements of IWD-2500. Applicable exemptions are as follows.

A. Component and piping segments NPS 4 and smaller. Components and piping segments which have one inlet and one outlet, both of which are NPS 4 or smaller. Components and piping segments which have multiple inlets or multiple outlets whose cumulative pipe cross-sectional area does not exceed the cross-sectional area defined by the OD of NPS 4 pipe.

B. Components that operate at a pressure of 275 psig or less, and at a temperature of 200 degrees F or less, in systems (or portions of systems) whose function is not required in support of RHR, CHR, and ECC.

C. Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe.

Personnel responsible for performance of the examinations should familiarize themselves with the requirements of this program prior to performing the examinations. Specifics concerning performance of NDE are **NOT** a part of this program, but are included in Inspection Services Organization Programs Manual (refer to Inspection and Examination Program (IEP) series).

1.3 Codes of Record and Code Cases

1.3.1 Current Code Requirements

The WBN Unit 2 Code of Record for the first inspection interval is the 2007 Edition, 2008 Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, Division 1 in accordance with 10 CFR 50.55a(g)(4)(i).

1.3.1 Current Code Requirements (continued)

10CFR50.55a-mandated additional requirements and/or exceptions are listed below along with the applicable 10CFR50 reference:

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10CFR50.55a(b)(2)(xxii)	IWA-2220 of the ASME Section XI 2007 Edition, 2008 Addenda, that allows the use of an ultrasonic examination method as a surface examination, is prohibited.
10CFR50.55a(b)(2)(xxiv) and 10CFR50.55a(b)(2)(xiv, & xv) are required)	Appendix VIII and supplements to Appendix VIII and Appendix I Article I-3000 of ASME Section XI 2007 Edition 2008 Addenda will be used. (Refer to Relief Request PDI-4 in section 7.9).
10CFR50.55a(b)(2)(xviii)(A)	Level I and II nondestructive examination personnel shall be recertified on a 3 year interval in lieu of the 5 year interval in IWA-2314(a) and IWA-2314(b) of ASME Section XI 2007 Edition, 2008 Addenda.
10CFR50.55a(b)(2)(xix)	The provisions in IWA–4520(b)(2) and IWA–4521 of the 2008 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, allowing the substitution of ultrasonic examination for radiographic examination specified in the Construction Code, are not approved for use.
10CFR50.55a(b)(2)(xxi)	Table IWB-2500-1 examination requirements: The provisions of Table IWB–2500–1, Examination Category B–D, Full Penetration Welded Nozzles in Vessels, Items B3.40 and B3.60 (Inspection Program A) and Items B3.120 and B3.140 (Inspection Program B) of the 1998 Edition must be applied when using the 1999 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section. A visual examination with magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria in Table IWB–3512–1, 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, with a limiting assumption on the flaw aspect ratio (i.e., a/l=0.5), may be performed instead of an ultrasonic examination.

1.3.1 Current Code Requirements (continued)

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10 CFR 50.55a(g)(6)(ii)(E)	Augmented ISI requirements: Reactor coolant pressure boundary visual inspections - (1) All licensees of pressurized water reactors must augment their inservice inspection program by implementing ASME Code Case N–722–1, subject to the conditions specified in paragraphs (g)(6)(ii)(E)(2) through (4) of this section. The inspection requirements of ASME Code Case N–722–1 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement. (2) If a visual examination determines that leakage is occurring from a specific item listed in Table 1 of ASME Code Case N–722–1 that is not exempted by the ASME Code, Section XI, IWB–1220(b)(1), additional actions must be performed to characterize the location, orientation, and length of crack(s) in Alloy 600 nozzle wrought material and location, orientation, and length of crack(s) in Alloy 82/182 butt welds. Alternatively, licensees may replace the Alloy 600/82/182 materials in all the components under the item number of the leaking component. (3) If the actions in paragraph (g)(6)(ii)(E)(2) of this section determine that a flaw is circumferentially oriented and potentially a result of primary water stress corrosion cracking, licensees must perform non-visual NDE inspections of components that fall under that ASME Code Case N–722–1 item number. The number of components inspected must equal or exceed the number of components found to be leaking under that item number. If circumferential cracking is identified in the sample, non-visual NDE must be performed in the remaining components under that item number. (4) If ultrasonic examinations of butt welds are used to meet the NDE requirements in paragraphs (g)(6)(ii)(E)(2) or (g)(6)(ii)(E)(3) of this section, they must be performed using the appropriate supplement of Section XI, Appendix VIII or the ASME Boiler and Pressure Vessel Code.

1.3.1 Current Code Requirements (continued)

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10CFR50.55a(g)(6)(ii)(D)	Augmented ISI requirements: Reactor vessel head inspections - (1) All licensees of pressurized water reactors must augment their inservice inspection program with ASME Code Case N–729–1, subject to the conditions specified in paragraphs (g)(6)(ii)(D)(*2*) through (*6*) of this section. Licensees of existing operating reactors as of September 10, 2008, must implement their augmented inservice inspection program by December 31, 2008. Once a licensee implements this requirement, the First Revised NRC Order EA–03–009 no longer applies to that licensee and shall be deemed to be withdrawn. (2) Note 9 of ASME Code Case N–729–1 must not be implemented. (3) Instead of the specified 'examination method' requirements for volumetric and surface examinations in Note 6 of Table 1 of Code Case N–729–1, the licensee must perform volumetric and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Figure 2 of ASME Code Case N–729–1. A demonstrated volumetric or surface leak path assessment through all J groove welds must be performed. If a surface examination is being substituted for a volumetric examination on a portion of a penetration nozzle that is below the toe of the J-groove weld [Point E on Figure 2 of ASME Code Case N–729–1], the surface examination must be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically. (4) By September 1, 2009, ultrasonic examinations must be performed using personnel, procedures and equipment that have been qualified by blind demonstration on representative mockups using a methodology that meets the conditions specified in (50.55a(g)(6)(ii)(D)(4)(i) through (iv), instead of the qualification requirements of Paragraph –2500 of ASME Code Case N–729–1. References herein to Section XI, Appendix VIII must be to the 2004 Edition with no Addenda of the ASME BPV Code. (i) The specimen set must have an applicable thickness qualification range of +25 percent to -40 percent for nominal depth through-wall thickness. The specimen set must include geometric and material conditions that normally require discrimination from primary water stress corrosion cracking (PWSCC) flaws. (ii) The specimen set must have a minimum of ten (10) flaws which provide an acoustic response similar to PWSCC indications. All flaws must be greater than 10 percent of the nominal pipe wall thickness. A minimum of 20 percent of the total flaws must initiate from the inside surface and 20 percent from the outside surface. At least 20 percent of the flaws must be in the depth ranges of 10–30 percent through wall thickness and at least 20 percent within a depth range of 31–50 percent through wall thickness. At least 20 percent and no more than 60 percent of the flaws must be oriented axially. (continued)

1.3.1 Current Code Requirements (continued)

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10CFR50.55a(g)(6)(ii)(D) (continued)	(iii) Procedures must identify the equipment and essential variables and settings used for the qualification, in accordance with Subarticle VIII–2100 of Section XI, Appendix VIII. The procedure must be requalified when an essential variable is changed outside the demonstration range as defined by Subarticle VIII–3130 of Section XI, Appendix VIII and as allowed by Articles VIII–4100, VIII–4200 and VIII–4300 of Section XI, Appendix VIII. Procedure qualification must include the equivalent of at least three personnel performance demonstration test sets. Procedure qualification requires at least one successful personnel performance demonstration. (iv) Personnel performance demonstration test acceptance criteria must meet the personnel performance demonstration detection test acceptance criteria of Table VIII—S10–1 of Section XI, Appendix VIII, Supplement 10. Examination procedures, equipment, and personnel are qualified for depth sizing and length sizing when the RMS error, as defined by Subarticle VIII–3120 of Section XI, Appendix VIII, of the flaw depth measurements, as compared to the true flaw depths, do not exceed ⅛ inch (3 mm), and the root mean square (RMS) error of the flaw length measurements, as compared to the true flaw lengths, do not exceed ⅜ inch (10 mm), respectively. (5) If flaws attributed to PWSCC have been identified, whether acceptable or not for continued service under Paragraphs -3130 or -3140 of ASME Code Case N–729–1, the re-inspection interval must be each refueling outage instead of the re-inspection intervals required by Table 1, Note (8) of ASME Code Case N–729–1. (6) Appendix I of ASME Code Case N–729–1 must not be implemented without prior NRC approval.

1.3.1 Current Code Requirements (continued)

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10CFR50.55a(g)(6)(ii)(F)	Augmented ISI requirements: Examination requirements for Class 1 piping and nozzle dissimilar-metal butt welds - (1) Licensees of existing, operating pressurized-water reactors as of July 21, 2011, must implement the requirements of ASME Code Case N–770–1, subject to the conditions specified in paragraphs (g)(6)(ii)(F)(2) through (10) of this section, by the first refueling outage after August 22, 2011. (2) Full structural weld overlays authorized by the NRC staff may be categorized as Inspection Items C or F, as appropriate; welds that have been mitigated by the Mechanical Stress Improvement Process (MSIP) may be categorized as Inspection Items D or E, as appropriate, provided the criteria in Appendix I of the code case have been met; for ISI frequencies, all other butt welds that rely on Alloy 82/182 for structural integrity must be categorized as Inspection Items A–1, A–2 or B until the NRC staff has reviewed the mitigation and authorized an alternative code case Inspection Item for the mitigated weld, or until an alternative code case Inspection Item is used based on conformance with an ASME mitigation code case endorsed in Regulatory Guide 1.147 with conditions, if applicable, and incorporated in this section. (3) Baseline examinations for welds in Table 1, Inspection Items A–1, A–2, and B, must be completed by the end of the next refueling outage after January 20, 2012. Previous examinations of these welds can be credited for baseline examinations if they were performed within the re-inspection period for the weld item in Table 1 using Section XI, Appendix VIII requirements and met the Code required examination volume of essentially 100 percent. Other previous examinations that do not meet these requirements can be used to meet the baseline examination requirement, provided NRC approval of alternative inspection requirements in accordance with paragraph50.55a(z)of this section is granted prior to the end of the next refueling outage after January 20, 2012. (4) The axial examination coverage requirements of -2500(c) may not be considered to be satisfied unless essentially 100 percent coverage is achieved. (5) All hot-leg operating temperature welds in Inspection Items G, H, J, and K must be inspected each interval. A 25 percent sample of Inspection Items G, H, J, and K cold-leg operating temperature welds must be inspected whenever the core barrel is removed (unless it has already been inspected within the past 10 years) or has reached 20 years, whichever is less. (6) For any mitigated weld whose volumetric examination detects growth of existing flaws in the required examination volume that exceed the previous IWB–3600 flaw evaluations or new flaws, a report summarizing the evaluation, along with inputs, methodologies, assumptions, and cause of the new flaw or flaw growth is to be provided to the NRC prior to the weld being placed in service other than modes 5 or 6. (continued)

1.3.1 Current Code Requirements (continued)

10CFR50.55a Reference	Mandated Additional Requirements/Exemptions
10CFR50.55a(g)(6)(ii)(F) (continued)	(7) For Inspection Items G, H, J, and K, when applying the acceptance standards of ASME B&PV Code, Section XI, IWB–3514, for planar flaws contained within the inlay or onlay, the thickness ‘‘t’’ in IWB–3514 is the thickness of the inlay or onlay. For planar flaws in the balance of the dissimilar metal weld examination volume, the thickness ‘‘t’’ in IWB–3514 is the combined thickness of the inlay or onlay and the dissimilar metal weld. (8) Welds mitigated by optimized weld overlays in Inspection Items D and E are not permitted to be placed into a population to be examined on a sample basis and must be examined once each inspection interval. (9) Replace the first two sentences of Extent and Frequency of Examination for Inspection Item D in Table 1 of Code Case N–770–1 with, ‘‘Examine all welds no sooner than the third refueling outage and no later than 10 years following stress improvement application.’’ Replace the first two sentences of Note (11)(b)(2) in Code Case N–770–1 with, ‘‘The first examination following weld inlay, onlay, weld overlay, or stress improvement for Inspection Items D through K must be performed as specified.’’ (10) General Note (b) to Figure 5(a) of Code Case N–770–1 pertaining to alternative examination volume for optimized weld overlays may not be applied unless NRC approval is authorized under paragraph50.55a(z) of this section.
10CFR50.55a Reference	Mandated Additional Requirements/Exemptions

1.3.2 Current Code Cases

Code cases used shall be implemented in their entirety unless approved by NRC or as stated in Regulatory Guide 1.147. The following table lists Code Cases that have been accepted for use by the NRC as found in Regulatory Guide 1.147 and may be used during implementation of this program. Other Code Cases may be added during the Interval as needed. Code Cases for other Programs, such as Containment ISI, Repair/Replacement, and System Pressure Testing are listed in the program documents pertaining to those programs.

Current to **Regulatory Guide 1.147, Revision 17**

Code Case	Title
N-460	Alternative Examination Coverage for Class 1 and Class 2 Welds
N-517-1	Quality Assurance Program Requirements for Owners
N-526	Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels
N-532-5	Repair/Replacement Activity Documentation Requirements and Inservice Inspection Summary Report Preparation and Submission
N-586-1	Alternative Additional Examination Requirements for Classes 1, 2, and 3 Piping,

1.3.2 Current Code Cases (continued)

	Components, and Supports, Section XI, Division 1
N-613-1	Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Item Nos. B3.10 and B3.90, Reactor Nozzle-to-Vessel Welds, Figs. IWB-2500-7(a), (b), and (c).
N-629	Use of Fracture Toughness Test Data to Establish Reference Temperature for Pressure Retaining Materials
N-639	Alternative Calibration Block Material **Conditions for Use:** Chemical ranges of the calibration block may vary from the materials specification if (1) it is within the chemical range of the component specification to be inspected, and (2) the phase and grain shape are maintained in the same ranges produced by the thermal process required by the material specification.
N-643-2	Fatigue Crack Growth Rate Curves for Ferritic Steels in PWR Water Environment
N-648-1	Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles **Conditions for Use:** 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 (the external surface is from point M to point N in the figure). Due to the increased radiation exposure to perform a visual exam, rather than the Code-required UT examination, this Code Case is not expected to be utilized.
N-705	Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks
N-706-1	Alternative Examination Requirements of Table IWB-2500 1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchangers. Code Case N-716-1 affects the use of this Code Case.
N-716-1	Alternative Classification and Examination Requirements. Risk-Informed ISI for Code Class 1, 2, 3, and Non-Code-Class components.
N-722-1	Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials **Note: Required Code Case mandated by NRC** See requirements and limitations in 10CFR50.55a(g)(6)(ii)(E)
N-729-1	Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds **Note: Required Code Case by NRC** See requirements and limitations in 10CFR50.55a(g)(6)(ii)(D)
N-735	Successive Inspection of Class 1 and 2 Piping Welds
N-747	Reactor Vessel Head-to-Flange Weld Examinations This Code Case allows a surface examination in lieu of a UT.

1.3.2 Current Code Cases (continued)

N-765	Alternative to Inspection Interval Scheduling Requirements of IWA-2430 This Code Case allows WBN-1 and WBN-2 to align ISI Intervals with some restrictions.
N-770-1	Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated With UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities **Note: Required Code Case by NRC** See requirements and limitations in 10CFR50.55a(g)(6)(ii)(F)

1.3.3 History of ISI and PSI Programs

A Preservice Inspection Program was performed in accordance with WBN-2 PSI, Preservice Inspection Program Plan.

The WBN Unit 2 operating license (full power) was issued on October 22, 2015. Commercial Operation is expected to begin on June 30, 2016 and the first interval ISI program is scheduled for June 30, 2016 to June 30, 2026.

1.4 Frequency Inspection Intervals and Inspection Periods

The inservice examinations required by ASME Section XI shall be performed during each 10-year interval of service (inspection interval). The inspection intervals represent calendar years after the unit has been placed into commercial service. The ISI examinations required by ASME Section XI, Division 1, during this inspection interval for Unit 2 shall follow the Inspection Program of IWA-2431. The inspection interval may be decreased or extended by as much as one year in accordance with IWA-2430(c)(1). In addition, if the unit is out of service continuously for six months or more, the inspection interval may be extended for an equivalent period in accordance with IWA-2430(d).

First Inspection Interval Period durations are:

- First Inspection Period – June 30, 2016 through June 30, 2019
- Second Inspection Period – June 30, 2019 through June 30, 2023
- Third Inspection Period – June 30, 2023 through June 30, 2026

This TRI may be performed in any mode and is applicable for all operational modes.

1.4 Frequency Inspection Intervals and Inspection Periods (continued)

Except for examinations that may be deferred to the end of the inspection interval, the required examinations shall be performed in accordance with the following schedule that complies with IWA-2431; IWB-2411 and Table IWB-2411-1; IWC-2411 and Table IWC-2411-1; IWD-2411 and Table IWD-2411-1; and IWF-2410 and Table IWF-2410-1.

The examinations deferred to the end of the inspection interval shall be completed by the end of the inspection interval.

This instruction is to be scheduled to be performed at least once each refueling outage.

1.5 Technical Requirements Fulfilled and Modes

Performance of this TRI satisfies the following Technical Surveillance Requirements:

SURVEILLANCE REQUIREMENT	APPLICABLE MODES	PERFORMANCE MODES
TSR 3.4.5.1	ALL MODES	MODES 5 and 6
TSR 3.4.5.2	ALL MODES	ALL MODES

1.6 Owner Statement

Owner:	**Tennessee Valley Authority**
Address of Corporate Office:	**Chattanooga Office Complex** **1101 Market Street** **Chattanooga, Tennessee 37402-2801**
Name and Address of Nuclear Power Plant:	**Watts Bar Nuclear Plant** **P.O. Box 2000** **Spring City, Tennessee 37381-2000**
Applicable Nuclear Power Units:	**Watts Bar Nuclear Plant, Unit 2**
Commercial Operation Date:	**June 30, 2016 (Scheduled)**

2.0 DEVELOPMENTAL REFERENCES

2.1 WBN Unit 2 Technical Requirement Manual

A. Technical Surveillance Requirement 3.4.5.1 and 3.4.5.2.

2.2 WBN Final Safety Analysis Report

A. Section 3.2, Classification of Structures, Systems and Components

B. Section 5.2.6, Pump Flywheels (Reactor Coolant Pump)

C. Section 5.2.8, Inservice Inspection of ASME Code Class 1 Components

D. Section 5.4.4.4, Inservice Inspection (Reactor Vessel and Appurtenances)

E. Section 6.6, Inservice Inspection of ASME Code Class 2 and 3 Components

2.3 NRC Documents

A. 10 CFR Part 50.55a, Codes and Standards, Inservice Inspection Requirements

B. 10 CFR Part 50.2, Definitions

C. Regulatory Guide 1.14, Reactor Coolant Pump Flywheel Integrity

D. Regulatory Guide 1.26, Quality Group Classification and Standards for Water, Steam, and Radioactive Waste Containing Components of Nuclear Power Plants

E. Regulatory Guide 1.147, Inservice Inspection Code Case Acceptability ASME Section XI Division 1

2.4 ASME Reference Documents

A. ASME Boiler and Pressure Vessel Code, Section XI, Division 1, 2007 Edition, 2008 Addenda

B. ASME Section XI Code Cases as listed in Section 1.3.2.

2.5 Plant Procedures and Instructions

A. Standard Programs and Processes, Department Procedures, and Site Standard Practices, Technical Procedures, Business Practices

1. NPG-SPP-03.18, Conduct of Quality Assessments

2. MMTP-102, Erection of Scaffolds/Temporary Work Platforms and Ladders

2.5 Plant Procedures and Instructions (continued)

3. NETP-113, PWR Alloy 600 Program and other Augmented Inspection Requirements
4. BP-257, Integrated Material Issues Management Plan
5. NPG-SPP-31.2, Records Management
6. NPG-SPP-22.300, Corrective Action Program
7. NPG-SPP-03.5, Regulatory Reporting Requirements
8. NPG-SPP-05.2, ALARA Program
9. NPG-SPP-05.4, Chemical Traffic Control
10. NPG-SPP-06.1, Work Order Process Initiation
11. NPG-SPP-06.4, Measuring and Test Equipment
12. NPG-SPP-06.5, Foreign Material Control
13. NPG-SPP-07.2, Outage Management
14. NPG-SPP-06.9.1, Conduct of Testing
15. NPG-SPP-06.9.2, Surveillance Test Program
16. NPG-SPP-09.1, ASME Code and Augmented Programs
17. NPG-SPP-09.11, Probabilistic Risk Assessment (PRA) Program
18. NPG-SPP-09.3, Plant Modifications and Engineering Change Control
19. 0-TI-31.013, Wall Thinning Monitoring Program For Microbiologically Induced Corrosion And General Corrosion

B. Plant Instructions

1. RCI-128, ALARA Program Implementation
2. 2-TI-12.07A, Containment Access Modes 1 - 4
3. 2-TI-12.07B, Containment Access Modes 5 & 6

C. WBN Maintenance and Technical Instructions

1. 0-MI-0.002, Valve Maintenance

2.5 Plant Procedures and Instructions (continued)

2. 2-MI-3.014, Removal and Reinstallation of Steam Generator Secondary Side Closures

3. 2-MI-68.001, Disassembly and Reassembly of the Unit 2 Reactor Pressure Vessel

4. 0-MI-68.004, Reactor Coolant Pump Seal Inspection or Replacement

5. 0-MI-68.06, Removal, Inspection and Maintenance of Reactor Coolant Pump Rotating Element

6. 2-MI-68.007, Removal and Installation of Steam Generator Primary Manway Covers

7. 0-MI-68.013, Removal and Replacement of Pressurizer Safety Valves

8. 2-MI-68.14, Removal and Replacement of Pressurizer Manway Cover

9. 0-MI-68.018, Adjustment and Replacement of Reactor Coolant Pump Main Flange Bolts

10. 2-MI-68.021, Pressurizer PORV Maintenance

11. 2-TRI-68-6, Unit 2 System Leakage Test Reactor Coolant System

12. 2-TRI-68-901, Reactor Coolant System Leakage Test In Lieu of Hydrostatic Testing

D. Inspection and Examination Procedures

1. IEP-100, Administration of Nondestructive Examination (NDE) Procedures

2. IEP-200, Qualification and Certification Requirements for TVA Inservice Inspection Services Organization (ISO) Nondestructive Examination (NDE) Personnel

3. IEP-203, Control of Nondestructive Examination (NDE) Calibration Standards

4. IEP-207, Control of TVA NDE Equipment and Supplies

5. IEP-300, Qualification and Certification of Ultrasonic Inservice Inspection Organization (ISO) personnel for Preservice and Inservice ASME Section XI Examinations

6. IEP-500, Guideline for Conducting Ultrasonic Examination of Dissimilar Metal Welds

2.5 Plant Procedures and Instructions (continued)

7. N-GP-7, Computation of Component Support Settings In Accordance With ASME Section XI

2.6 EPRI Documents

A. EPRI Materials Reliability Program (MRP)

1. MRP-126, Generic Guidance for an Alloy 600 Management Plan

2. MRP-139, Primary System Piping Butt Weld Inspection and Evaluation Guideline

3. MRP-146, Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines

B. EPRI Guidelines

1. EPRI Report 1018181, Nondestructive Evaluation: Guideline for Conducting Ultrasonic Examinations of Dissimilar Metal Welds

2.7 Nuclear Energy Institute (NEI) Guidelines

A. NEI 03-08, Guideline for the Management of Materials Issues

2.8 Westinghouse Documents

A. WAT-D-12064, SG Upper Lateral Support Splice Bolts

2.9 ISI Drawings

(See Appendix G)

2.10 Abbreviations

ALARA	As Low As Reasonably Achievable
ASNT	American Society for Nondestructive Testing
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
DCRM	Document Control and Records Management
IEP	Inspection and Examination Procedures
ISI	Inservice Inspection
NDE	Nondestructive Examination
NRC	Nuclear Regulatory Commission
RADPRO	Radiation Protection
RFR	Request for Relief
RWP	Radiation Work Permit
SI	Surveillance Instruction
SPP	Standard Processes and Procedures
WO	Work Order

3.0 PREREQUISITES AND PRECAUTIONS

3.1 Prerequisites

A. When craft support of minor or similar maintenance (examples: scaffolding, insulation removal, buffing of welds using Scotchbrite or other cleaning pads, and cleaning bolts) is required to facilitate performance of this TRI, a WO may be used. This WO shall be processed in accordance with NPG-SPP-06.1. Additional WOs are required to remove fire barrier insulation foam in sleeves, piping support clamps, steam generator support rings, reactor coolant pump flywheel access covers and plugs, etc.

B. Contact RADPRO for radiation work permit (RWP)/ALARA preplanning requirements. Coordination with RADPRO should begin as soon as components are identified to be scheduled for examination during a particular refueling outage.

3.2 Precautions

A. Safety belts should be worn when working from scaffolding or ladders in accordance with MMTP-102.

B. Protective clothing, such as long-sleeve shirts, should be worn when working around hot pipes and equipment.

3.2 Precautions (continued)

C. Care should be exercised when climbing on plant structures and piping to ensure firm footing and to prevent damaging site equipment. Walking on flex hoses and insulation shall be avoided.

D. Efforts should be made to ensure proper planning to reduce delays and radiation exposure in performance of the work.

E. Read and observe all applicable precautions as indicated in WBN Instruction 2-TI-12.07A and 2-TI-12.07B, Containment Access, and NPG-SPP-06.5, Foreign Material Control.

4.0 SPECIAL TOOLS AND EQUIPMENT

Equipment shall be specified by individual NDE Procedures.

5.0 ACCEPTANCE STANDARDS

The acceptance criteria shall be in accordance with IWA-3000 and the individual NDE Procedures of IEP-100.

Evaluations of examinations in accordance with IWB-3132.3, IWB-3142.4, IWC-3122.3, or IWC-3132.3 shall be submitted to the NRC. This information shall be submitted with the Inservice Inspection Summary Report or, if deemed necessary, a separate report shall be submitted. The evaluations shall be documented on or referenced on the Notification of Indication.

6.0 QUALIFICATIONS OF NDE PERSONNEL

Personnel performing NDE operations shall be qualified and certified in accordance with IWA-2300, IEP-200, and IEP-300.

7.0 IMPLEMENTATION AND RESPONSIBILITIES

Any revisions to this program initiated by other groups shall be submitted to ISI/NDE for approval prior to incorporating the revisions into this program.

Responsibilities shall be in accordance with NPG-SPP-09.1, Part A.

7.1 NDE Examinations

A. NDE methods shall be in accordance with IWA-2200 of ASME Section XI and this program as scheduled in Appendices A-K.

7.1 NDE Examinations (continued)

B. NDE shall be performed in accordance with IWA-2200 and the individual NDE Procedures of IEP-100.

C. In accordance with IWA-2600, a reference system shall be established for all welds and areas subject to surface or volumetric examination. Each such weld and area shall be located and identified by a system of reference points in accordance with applicable NDE procedures.

D. When less than the required code examination volume or area is examined, the percentage examined shall be documented on the examination data sheet. The cause of the limitation shall be clearly specified and documented on the examination data sheet. The examination with less than the required ASME Section XI Code examination volume or area shall be handled as a request for relief in accordance with NPG-SPP-09.1, Part A.

7.2 Components Subject to Examination

A. ASME Class 1 Equivalent Components Subject to Examination (IWB)

1. The ASME Class 1 equivalent systems subject to examination are: Chemical and Volume Control System; Reactor Coolant System; Residual Heat Removal System; and Safety Injection System. The specific components subject to examination are identified on drawings listed in Appendix G, ISI Drawings List.

2. Components are scheduled for examination in accordance with ASME Section XI, Table IWB-2500-1. The number of components within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Appendix A. ASME Class 1 valves subject to examination are listed in Appendix F.

3. The rules of IWB-1220(a), (b),and (c) have been used to establish exemption criteria for components and establish the numbers in Appendix A.

4. Examination Category B-A, B-B, B-D, B-G-1, B-G-2, B-K, B-L-2, B-M-2, B-N-1, B-N-2, B-N-3, B-O, shall be selected for examination in accordance with Table IWB-2500-1, 2007 Edition, 2008 Addenda of ASME Section XI.

5. Former Code Categories B-F and B-J have been reclassified as Code Category R-A in accordance with ASME Section XI Code Case N-716-1. Components shall be selected for examination in accordance with Code Case N-716-1. Periodic updates to the RI-ISI program will be required as discussed in Section 7.12 and as detailed in Code Case N-716-1. Some Category B-F and B-J welds are also addressed by Code Case N-770-1. Reference the Alloy 600 Table for details.

7.2 Components Subject to Examination (continued)

6. Examination requirements for ASME Class 1 equivalent component supports, Examination Category F-A, shall be in accordance with ASME Section XI Subsection IWF. See Section 7.2.D.

7. Welded support attachment examination is also required whenever component support member deformation (e.g., broken, bent, or pulled out parts) is identified during operation, refueling, maintenance, examination, inservice inspection, or testing.

8. Examination coverage of ASME Class 1 equivalent welds will be in accordance with Code Case N-460 unless impractical due to original plant design. In this case the examination will be processed in accordance with Section 7.9.

B. ASME Class 2 Equivalent Components Subject to Examination (IWC)

1. ASME Class 2 equivalent systems subject to examination are: Containment Spray System; Feedwater System; High Pressure Safety Injection System (includes Chemical Volume Control, Safety Injection and RCP Seal Injection); Main Steam System; Residual Heat Removal System; and Safety Injection System. The specific components subject to examination are identified on drawings listed in Appendix G, ISI Drawings List.

2. Components are scheduled for examination in accordance with ASME Section XI, Table IWC-2500-1, 2007 Edition 2008 Addenda of ASME Section XI. The number of components within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Appendix B.

3. The rules of IWC-1220 have been used to establish exemption criteria for components and establish the numbers in Appendix B.

4. Examination Category C-C components shall be selected for examination in accordance with Table IWB-2500-1, 2007 Edition, 2008 Addenda of ASME Section XI.

5. Former Code Categories CA, C-B, C-D, C-F-1, and C-F-2 have been reclassified as Code Category R-A in accordance with ASME Section XI Code Case N-716-1. Components shall be selected for examination in accordance with Code Case N-716-1. Periodic updates to the RI-ISI program will be required as discussed in Section 7.12 and as detailed in Code Case N-716-1.

6. Examination requirements for ASME Class 2 equivalent component supports, Examination Category F-A, shall be in accordance with ASME Section XI Subsection IWF. See Section 7.2.D.

7.2 Components Subject to Examination (continued)

7. Examination coverage of ASME Class 2 equivalent welds will be in accordance with Code Case N-460 unless impractical due to original plant design. In this case the examination will be processed in accordance with Section 7.9.

8. Welded support attachment examination is also required whenever component support member deformation (e.g.: broken, bent, or pulled out parts) is identified during operation, refueling, maintenance, examination, inservice inspection, or testing.

C. ASME Class 3 Equivalent Components Subject to Examination (IWD)

1. ASME Class 3 equivalent systems subject to examination are: Auxiliary Feedwater System; Component Cooling System; and Essential Raw Cooling Water System. The specific components subject to examination are identified on drawings listed in Appendix G, ISI Drawings List.

2. The rules of IWD-1220 have been used to establish exemption criteria for components.

3. Examination requirements for ASME Class 3 equivalent component supports, Examination Category F-A, shall be in accordance with ASME Section XI Subsection IWF. See Section 7.2.D.

D. Component Supports Subject to Examination (IWF)

1. Component supports shall be examined in accordance with Table IWF-2500-1. Component supports to be examined shall be the supports of components NOT exempted in accordance with section 7.2.D.2. These component and piping supports are within the systems identified in sections 7.2.A.1, 7.2.B.1, and 7.2.C.1. The specific supports subject to examination are identified on ISI Drawings listed in Appendix G.

2. Component supports exempt from NDE examinations are those connected to piping or other items exempted from volumetric, surface or VT-1 or VT-3 visual examination by IWB-1220, IWC-1220, and IWD-1220, and portions of supports that are inaccessible by being encased in concrete, buried underground, or encapsulated by guard pipe.

3. Supports depicted as snubbers on the support drawings are subject to examination up to but not including the snubber pins in accordance with IWF-5300(c). The snubber is outside the examination boundary. The examination/testing of snubbers is covered by the Snubber Inservice Testing Program.

7.2 Components Subject to Examination (continued)

4. The number of supports subject to an examination sample plan, the number selected for examination during the inspection interval and the number selected for examination by period are provided in Appendix D.

5. Support examination boundaries shall be in accordance with IWF-1300. When determining equipment support boundaries, consideration is to be given to include miscellaneous steel for each equipment support. Acceptance range for support settings shall be calculated in accordance with Inspection Services Organization Programs Manuals (Refer to Nondestructive Examination Procedure N-GP-7).

6. Component supports that have been adjusted in accordance with IWF-3000 or corrected by repair or replacement shall be preservice examined prior to return of the system to service per the applicable examinations listed in Table IWF-2500-1.

   Also for systems that operate above 200 degrees F during normal operation, an additional preservice examination shall be performed on the affected component support(s) during or following the subsequent system heat-up and cool-down cycle unless determined unnecessary by evaluation. This examination shall be performed during operation or at the next refueling outage.

7. Piping support function is determined by using the latest analysis drawing with change paper for piping. If the piping does not have an associated analysis drawing, the latest support drawing with change paper will be used to determine support function.

   a. Support Function A – Supports such as one-directional restraints.

   b. Support Function B – Supports such as multidirectional restraints.

   c. Support Function C – Supports that allow thermal movement, such as variable or constant force springs.

   d. Support Function D – Either hydraulic or mechanical snubbers.

7.3 Notification of Indication

Whenever an unacceptable inservice examination indication is discovered, an NOI shall be initiated in accordance with NPG-SPP-09.1, Part A. The NOI is to be used to:

A. Notify Plant Management of unacceptable indications found during the performance of scheduled ASME Section XI inservice examinations that will require evaluation and a disposition in accordance with plant procedures.

7.3 Notification of Indication (continued)

B. Notify ISI/NDE Representative of indications that exceed the acceptance criteria of Article IWX-3000 of the ASME Section XI Code and that the indications have been documented on an examination report form contained within the NDE procedure used for examination.

C. Provide ISO and ISI/NDE Representative with a method to track examination reports that require reexamination or a documented disposition for closure.

D. As a final product, with the disposition provided in accordance with plant procedures added to Part II of the NOI Form; to provide the ISI/NDE Representative a method of determining if additional and/or successive examinations are required in accordance with the Code.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components

After a Notification of Indication (NOI) has been dispositioned and returned to the ISI/NDE Representative (reference Section 7.3), the NOI shall be evaluated to determine if additional examinations shall be required in accordance with ASME Section XI IWB-2430, IWC-2430, IWD-2430, IWF-2430, or Code Case N-716-1, as applicable. If it is determined that additional examinations are required, these examinations shall be performed during the same outage as the initial examinations. A sample is defined as those items (welds, areas, or parts) as described or intended in a particular examination category and item number and within the same system. The initial sample is the sample scheduled for examination at a particular outage for Section XI credit.

For components inspected per ASME Code Case N-716-1, refer to the Code Case for instructions on additional examinations.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components (continued)

NOTE

Code Case N-586-1

"Alternative Additional Examination Requirements for Class 1, 2, 3 Piping, Components, Supports"

Code Case N-586-1 may be used as an alternative to additional examination requirements of ASME Section XI, provided the engineering evaluations addressed under Item (a) of the code case and the additional examinations addressed under Item (b) of the code case shall be performed during this outage. If the additional examinations performed under item (b) of the code case reveal indications exceeding the applicable acceptance criteria of Section XI, the engineering evaluations and the examinations shall be further extended to include additional evaluations and examinations at this outage.

Code Case N-586-1 may not be used as an alternative to additional examination requirements of ASME Code Case N-716-1 (Risk-Informed ISI), unless approval is obtained from the NRC prior to use. For components inspected per ASME Code Case N-716-1, refer to the Code Case for instructions on additional examinations.

NOTES

1) Welds, areas, or parts are those described or intended in a particular inspection item of Table IWX-2500-1.
2) An inspection item, as listed in Table IWX-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).
3) The following instructions for Additional Examinations are for ASME Section XI Code examinations and do not apply to examinations conducted per ASME Code Case N-716-1.

A. Additional Examinations for Class 1 Equivalent Components (IWB)

Additional examinations for Class 1 equivalent components (IWB), excluding supports, shall be in accordance with the requirements of IWB-2430. The additional examination samples are defined as those items (welds, areas, or parts) in a particular examination category and item number and within the same system. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components (continued)

1. Examinations performed in accordance with Table IWB-2500-1, except for Examination Category B-P, of the initial sample that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1 shall be extended to include additional examinations except for volumetric and surface examinations where IWB-3112(b) is applicable. (Such as, flaws detected by volumetric or surface examinations that meet the nondestructive examination standards of NB-2500 and NB-5300, as documented in QA records, shall be acceptable).

2. The first additional examination sample shall include an additional number of welds, areas, or parts included in the inspection item 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.

3. If the first additional examinations of section 7.4.A.2 reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1, except where IWB-3112(b) is applicable, the examinations shall be further extended to include additional examinations during the current outage. The second additional examination sample 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.

4. If examinations performed in the second additional examination sample reveal indications exceeding the acceptance standards of Table IWB-3410-1, the indications shall be evaluated for further action, if needed.

5. 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.

6. For steam generator tubing, additional examinations shall be governed by plant Technical Specifications.

7. 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, additional examinations shall be performed, if determined necessary, based on an evaluation by the Owner.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components (continued)

B. Additional Examinations for Class 2 Equivalent Components (IWC)

Additional examinations for Class 2 equivalent components (IWC), excluding supports, shall be in accordance with IWC-2430. The additional examination samples are defined as those items (welds, areas, or parts) in a particular examination category and item number and within the same system. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

1. Examinations of the initial sample that reveal indications exceeding the acceptance standards of table IWC-3410-1 shall be extended to include additional examinations in the same outage except for volumetric and surface examinations where IWC-3112(b) is applicable. (Such as, flaws detected by volumetric or surface examinations that meet the nondestructive examination standards of NC-2500 and NC-5300, as documented in QA records, shall be acceptable).

2. The first additional sample shall include an additional number of items included in the inspection item equal to 20% of the number of items included in the inspection item that are scheduled to be performed during the inspection interval. The additional examination sample shall be selected from items of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

3. If the first additional examinations of Section 7.4.B.2 reveal flaws or relevant conditions exceeding the acceptance standards of Table IWC-3410-1, except where IWC-3121(b) is applicable, the examinations shall be further extended to include additional examinations during the current outage. The second additional examination sample shall include the remaining number of items of similar material and service subject to the same type of flaws or relevant conditions.

4. For the inspection period following the period in which the examinations of 7.4.B.2 or 7.4.B.3 were completed, the examinations shall be performed as originally scheduled in accordance with IWC-2400.

C. Additional Examinations for Class 3 Equivalent Components (IWD)

Additional examinations for Class 3 equivalent components (IWD) shall be in accordance with IWD-2430. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components (continued)

1. Examinations performed in accordance with Table IWD-2500-1 of the initial sample that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWD-3000 shall be extended to include additional examinations during the current outage.

2. The first additional sample shall include an additional number of items included in the inspection item that are scheduled to be performed during the inspection interval. The additional examination sample shall be selected from items of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

3. If the first additional examination sample of section 7.4.C.2 reveals flaws or relevant conditions exceeding the acceptance standards of Table IWD-3000, the examinations shall be further extended to include additional samples during the current outage. The extent of the additional examinations shall be determined by engineering based upon an engineering evaluation of the root cause of the flaws or relevant conditions. The corrective actions shall be documented in accordance with IWA-6000.

4. For the inspection period following the period in which the examinations of 7.4.C.2 or 7.4.C.3 were completed, the examinations shall be performed as originally scheduled in accordance with IWD-2400.

D. Additional Examinations for Component Supports (IWF)

Additional examinations for component supports (IWF) shall be in accordance with IWF-2430. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

1. Examinations performed in accordance with IWF-2500 of the initial sample that reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400 and that require corrective action 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.

2. When the first additional examination sample of section 7.4.D.1 reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400 and that require corrective action, the examinations shall be further extended to include additional examinations during the current outage. The component supports within the system of the same type and function as in section 7.4.D.1.

7.4 Additional Examinations for ASME Code Class 1, 2, 3 and non-Code components (continued)

3. When the second additional sample of section 7.4.D.2 reveals flaws or relevant conditions exceeding the acceptance standards of IWF-3400 and that require corrective action, examinations shall be extended to include a third additional sample of all nonexempt supports potentially subject to the same failure modes that required corrective actions in accordance with 7.4.D.1 and 7.4.D.2. Also, these additional examinations shall include nonexempt component supports in other systems when support failures requiring corrective actions indicate non-system related failure modes.

4. When the third additional sample of section 7.4.D.3 reveals flaws or relevant conditions exceeding the acceptance standards of IWF-3400 and that require corrective action, examinations shall be extended to those exempt component supports that could be affected by the same observed failure modes and could affect nonexempt components.

E. Completion of Additional Examinations

After completion of the additional examinations, ASME Section XI Code requirements for additional examinations are complete. If the final sample examinations reveal indications which exceed the acceptance standards of Article IWX-3000, the indications shall be evaluated for further action, if needed, within this and /or other systems.

Site Engineering shall be notified by using the Notification of Additional Sample Results Form in Appendix I. Included in the notification should be a summary of the indications found, number of examinations, number of indications in each sample, type of examinations performed, examination category, item number, copies of the NOIs, and any other pertinent information.

7.5 Corrective Action Program and Successive Examinations

Corrective actions required as a result of ISI examinations per ASME Section XI shall be handled in accordance with NPG-SPP-03.1.

For components inspected per ASME Code Case N-716-1, refer to the Code Case for instructions on successive examinations.

7.5 Corrective Action Program and Successive Examinations (continued)

A. Successive Examinations - Class 1 Equivalent Components

Areas containing flaw indications or relevant conditions evaluated in accordance with IWB-3132.3 or IWB 3142.4 and NPG-SPP-03.1 that qualify for continued service shall be reexamined during the next three inspection periods listed in the inspection schedules. If the re-examinations reveal that the flaw indications remain essentially unchanged for three successive inspections, then the component examination schedule may revert to the original schedule. Components requiring successive examinations shall be scheduled for examination in Appendix H.

B. Successive Examinations - Class 2 Equivalent Components

Components with flaw indications evaluated in accordance with IWC-3122.3 or IWC-3132.3 and NPG-SPP-03.1 that qualify for continued service shall be reexamined during the next inspection period listed in the inspection schedule. If the reexamination reveals that the flaw indications remain essentially unchanged, the component examination schedule may revert to the original schedule. Components requiring successive examinations shall be scheduled for examination in Appendix H.

C. Successive Examinations for Class 3 Equivalent Components

Components with flaw indications or relevant conditions evaluated in accordance with IWD-3000 and NPG-SPP-22.300, Corrective Action Program, that qualify for continued service shall be re-examined during the next inspection period listed in the inspection schedule. If the re-examination reveals that the flaws remain essentially unchanged, the component examination schedule may revert to the original schedule. Components requiring successive examinations shall be scheduled for examination in Appendix H.

D. Successive Examinations for Class 1, 2 and 3 Component Supports (IWF)

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 inspection schedule. Component supports requiring successive examination shall be scheduled for examination in Appendix H.

When these examinations do not require additional corrective measures, the inspection schedule may revert to the original schedule.

7.6 Configuration Changes

When modifications are made to existing piping or components, drawings shall be reviewed and revised by ISI/NDE Representative to identify the piping configuration, welds, and components that shall be included in or deleted from the ASME Section XI ISI/NDE Program.

If variations in configuration are discovered or modifications (including additions and deletions), replacements, or repairs are made during the service life of the unit, these changes shall be marked on field corrected copies of the appropriate drawings. These field corrected copies shall be used in the performance of examinations. The scan plan shall be revised in accordance with Section 7.10, as necessary to reflect these field corrected drawings (interim working drawings) and any preservice and/or inservice examinations performed due to these variations in configuration. ISI/NDE Representative shall be responsible for reviewing the proposed change, revising and issuing the drawing as necessary in accordance with NPG-SPP-09.1, Part A.

7.7 Calibration Standards and M&TE

Calibration blocks used for ultrasonic examination shall be in accordance with NPG-SPP-09.1, Part A and IEP-203. Calibration blocks from other TVA sites and/or vendors may be used following review and assignment by a TVA Level III. The ISI Engineer shall be responsible for the control, storage, handling, and use of calibration block standards. Measuring and Test Equipment (M&TE) used for ISI shall be controlled in accordance with IEP-207.

7.8 Records and Reports

Records and reports shall be prepared in accordance with NPG-SPP-09.1, Part A.

7.9 Requests for Relief (RFR)

When TVA has determined that Code requirements or examinations are impractical, TVA shall submit written requests for relief (RFR) to the NRC with information to support the need for relief and any proposed alternate examinations. The impractical Code requirements or relief situation shall be identified as a part of the examination schedule tables (Appendices A-D) in this program and references to a particular RFR shall be included. Requests for relief shall be prepared in accordance with NPG-SPP-09.1.

Requests for relief listings are included in Appendix J.

7.10 Interval Schedule and Scan Plan

For each inspection interval, a detailed implementation schedule shall be prepared for each inspection plan described in this procedure. The schedule shall include the following, in accordance with IWA-2420:

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

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

C. Identification of drawings showing items that require examination;

D. List of examination procedures;

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

F. Identification of calibration blocks used for ultrasonic examination of components.

NOTE

The detailed implementation schedule for the first inspection interval will be developed and maintained electronically in the ISI Database.

A computerized data base system will be utilized for status and Section XI credit of completed ISI examinations and those augmented examinations which have been integrated with the ASME Section XI ISI/NDE Program. The contents of the database, i.e., the scope of examinations for the interval shall be provided to the Authorized Nuclear Inservice Inspector (ANII) for his review. The data base is utilized to provide a scan plan. A scan plan is the primary scheduling document for each fuel cycle, listing components requiring examination during a specific refueling outage. A scan plan may also be utilized to provide a listing of components to be examined for non-outage activities.

Prior to performing exams, the scan plan shall be approved by Programs Engineering Group and shall be provided to the Authorized Nuclear Inservice Inspector (ANII) for his review. As part of the approval process, the scan plan shall be reviewed by the ISI/NDE supervisor, NDE Level III examiner, ISI Program Owner, Engineering Programs Manager, and independently verified. The independent verification shall verify all required exams (ISI, IWE, and Augmented) are contained in the scan plan. All reviews and verifications shall be documented by signature on the scan plan coversheet.

7.10 Interval Schedule and Scan Plan (continued)

During implementation phases (usually outage periods), it may become necessary to revise the scan plan. Scan plan revisions can be initiated by Engineering Programs Representative, ISO, or by other personnel involved with the implementation of the scan plan. All revisions shall be independently verified by the ASME Section XI Program owner and a qualified NDE Level III examiner, as documented in the scan plan revision log. Once the revisions are incorporated into the final scan plan, additional approval by the Programs Engineering Manager shall be documented on the revised scan plan cover sheet. Revisions shall be coordinated, as needed, with the appropriate plant planning and scheduling personnel for facilitating the use of supporting craft personnel. Revisions to the scan plan shall be controlled in the same manner as the original. However, interim working copies may be hand written to allow examinations to be performed before a formal revision is issued. The approving individuals shall initial and date interim revisions on the scan plan.

NOTE

When inservice examinations are performed as a result of instructions other than this program (e.g., maintenance instructions, work plans, etc.), copies of the examination data sheet shall be submitted to Engineering Programs by the performing organization for assignment of a report number and incorporation into the scan plan.

7.11 Augmented Examinations

Augmented examinations are performed in addition to ASME Section XI code requirements. The augmented examinations may be required by the NRC or be self-imposed by TVA. Typical sources include generic letters, IE bulletins, technical specifications, vendor recommendations, and industry experience. NPG-SPP-09.1, Part A provides requirements for requesting augmented examinations. Appendix K provides a description and schedule for augmented examinations currently integrated with the ISI Program.

7.12 RI-ISI Periodic Updates

As a minimum, updates to the RI-ISI Program portions of 2-TRI-0-10.1 shall be performed at least on an inspection-period basis that coincides with the inspection program requirements contained in Section XI IWA-2431, Inspection Program, and Inspection Periods as specified for each Code Class. The RI-ISI Program shall be evaluated as new information becomes available that could impact the program. Changes to the PRA, piping performance, plant procedures that affect system operating parameters, piping inspections, component and valve lineups, equipment operating modes, or the ability of plant personnel to perform actions associated with accident mitigation shall be reviewed for any RI-ISI Program updates. Leakage and flaws identified during scheduled inspections shall be evaluated for possible RI-ISI Program updates during this periodic review.

7.12.1 Performance Monitoring

The Program Owner will maintain an awareness of input changes. After each inspection period, the effects of the changes will be evaluated to determine if a change to the Program is required.

The RI-ISI program will be updated, if required, during the subsequent inspection period. The ISI Program Engineer, with possible assistance from the EPRI NDE Center's Subscriber Request Assistance (SRA) program, who are RI-ISI experts, will review proposed RI-ISI program changes and provide program oversight. The following provides an overview of the RI-ISI program inputs.

A. Plant Design Feature Changes

Design changes have the potential to change piping configuration and alter stress calculations which were used as input to the calculations performed in support of the RI-ISI program. New systems and branch piping will be evaluated for inclusion into the scope of the RI-ISI program. Consequently, the Design Control program will be revised to recognize RI-ISI and to ensure impact is appropriately evaluated during design preparation, review, and implementation. The existing design impact review process will also be used to ensure the impact of design changes on RI-ISI has been appropriately considered prior to final approval. The calculations supporting the RI-ISI program will be entered into TVA's calculation tracking program to ensure appropriate predecessors and inputs are identified and considered during design change preparation and review.

B. Plant PRA Changes

Since the PRA forms the basis for the RI-ISI program, any changes to the PRA or risk significance determination will be evaluated for impact on the RI-ISI program.

7.12.1 Performance Monitoring (continued)

This would also include changes to risk significance categories which would include reviews by the ISI Program Engineer with possible assistance from the EPRI NDE Center's Subscriber Request Assistance (SRA) program. PRA and design changes will be incorporated into the RI-ISI program as required.

C. Plant Procedure Changes

Changes to plant procedures that affect ISI, such as system operating parameters, test intervals, or the ability of plant operations to perform actions associated with accident mitigation shall be considered in any RI-ISI program update. Additionally, changes in procedures that affect component inspection intervals, valve lineups, or operational modes of equipment shall also be assessed for their impact on changes in postulated failure mechanism initiation or Core Damage Frequency (CDF).

D. Equipment Performance Changes

Equipment performance changes shall be reviewed with system engineers and maintenance to ensure that changes in performance parameters (e.g., valve leakage, increased pump testing, and vibration problems) are considered in the RI-ISI program update. Specific attention shall be paid to these type conditions if not previously assessed in the qualitative inputs to the component selections of the RI-ISI program. Adverse equipment performance will be evaluated for changes to the RI-ISI inspection scope.

E. Examination Results

When scheduled RI-ISI program NDE examinations, pressure tests and corresponding VT-2 visual examinations for leakage have been completed, and unacceptable flaws, evidence of service related degradation, or indications of leakage have been identified, these conditions shall be evaluated in accordance with plant procedures as applicable to determine the adequacy of the scope of the inspection program and update the RI-ISI program as applicable.

F. Individual Plant and Industry Failure Information

The Program Owner will consider applicable piping failures or degradations identified by the site's corrective action program. Industry awareness will be maintained through the sites Operating Experience program, NRC Generic Letters and Bulletins, site participation in Pressurized Water Reactor Owners Group initiatives, and participation in the ASME Section XI Code committee activities.

7.12.1 Performance Monitoring (continued)

G. Program Review

The Manager of Engineering Programs will provide the oversight role for the RI-ISI program. Other affected departments will be invited to the inspection-period reviews. As with past reviews, personnel possessing expertise in RI-ISI evaluation and ISI inspection/evaluation, including possibly the EPRI NDE Center's Subscriber Request Assistance (SRA) program personnel, will be present during the presentation, and the review of the above items when the inspection period reviews occur.

Data Package: Page _____ **Date _____**

8.0 PERFORMANCE

[1] **OBTAIN** Unit Supervisor (US), or designee, approval to perform this Instruction on Surveillance Task Sheet. _____

[2] **RECORD** start date and time on Surveillance Task Sheet. _____

[3] **INDICATE** the current ISI Interval and Period and whether the current Refueling Outage is the first or second of this Period.

A. ISI Interval 1, Period 1 ☐
ISI Interval 1, Period 2 ☐
ISI Interval 1, Period 3 ☐ _____

B. First RFO of Period ☐
Second RFO of Period ☐ _____

C. Fuel Cycle/RFO Number: _____. _____

[4] **IF** Step 8.0[3]B indicates that this is the first Refueling Outage of the current ISI Period, **THEN**

ATTACH the ISO Report of examinations completed during this refueling outage to the Data Package, and

VERIFY that all planned/scheduled examinations were completed, as required, to support the ISI scan plan. _____

[5] **IF** Step 8.0[3]B indicates that this is the second Refueling Outage of the current ISI Period, **THEN**

PERFORM the following:

A. **ATTACH** the ISO Report of examinations completed during this refueling outage to the Data Package. _____

B. **ATTACH** the ISO Report of examinations completed during the previous refueling outage to the Data Package. _____

C. **VERIFY** that examinations documented on the two attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix A. _____

Data Package: Page _____ **Date _____**

8.0 PERFORMANCE (continued)

D. **VERIFY** that examinations documented on the two attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix B. _____

E. **VERIFY** that examinations documented on the two attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix C. _____

F. **VERIFY** that examinations documented on the two attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix D. _____

G. **VERIFY** that examinations documented on the two attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix E. _____

[6] **IF** Step 8.0[3]B indicates that this is any Refueling Outage other than the SECOND Refueling Outage of the THIRD ISI Period of the current ISI Interval, **THEN**

ATTACH the ISO Report of examinations completed during this refueling outage to the Data Package, and

VERIFY that all planned/scheduled examinations as identified on Appendix F were completed, as required, to support the ISI scan plan. _____

[7] **IF** Step 8.0[3]B indicates that this is the SECOND Refueling Outage of the THIRD ISI Period of the current ISI Interval, **THEN**

PERFORM the following:

A. **ATTACH** the ISO Report of examinations completed during any refueling outage of the current ISI Interval that documents completion of the required examination of valves shown on Appendix F to the Data Package. _____

B. **VERIFY** that examinations documented on the attached ISO reports satisfy the required number of examinations in each Exam Category as shown in Appendix F. _____

Data Package: Page _____ **Date _____**

8.0 PERFORMANCE (continued)

[8] **VERIFY** that all successive examinations as shown on Appendix H that were required to be performed during the Fuel Cycle/Refueling Outage number recorded in Step 8.0[3]C have been completed, and

ATTACH the ISO Report of successive examinations completed during this refueling outage to the Data Package. _____

[9] **VERIFY** that all augmented examinations as shown on Appendix K required to be performed during the Fuel Cycle/Refueling Outage number recorded in Step 8.0[3]C have been completed, and

ATTACH the ISO Report of successive examinations completed during this refueling outage to the Data Package. _____

[10] **RECORD** completion date and time on Surveillance Task Sheet. _____

Data Package: Page _____ **Date _____**

9.0 RECORDS

9.1 QA Records

The Data Package is a QA record, is handled in accordance with the Document Control and Records Management Program, and contains the following:

A. Completed parts of Section 8.0.

B. Surveillance Task Sheet.

C. ISO Examination Reports.

D. Other sheets added during the performance.

9.2 Non-QA Records

None

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-A		**Pressure Retaining Welds in Reactor Vessel**									
B-A	B1.10	RV Shell Welds									
B-A	B1.11	RV Shell Welds Circumferential	UT	4	100%	4	Deferral Permissible	0	0	4	ISI-2068A-E-02, E-03
B-A	B1.12	RV Shell Welds Longitudinal	Volumetric	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	
B-A	B1.20	RV Head Welds									
B-A	B1.21	RV Head Welds Circumferential	UT	2 (closure head and lower head)	100% of accessible length	2	Deferral Permissible	0	0	2	ISI-2068A-E-04, E-15
B-A	B1.22	RV Head Welds Meridional	UT	6 Meridional welds (lower head)	100% of accessible length	6	Deferral Permissible	0	0	6	ISI-2068A-E-15
B-A	B1.30	RV Shell-to-Flange Weld	UT	1	100%	1	Partial Deferral	0	0	1	ISI-2068A-E-15
B-A	B1.40	RV Head-to-Flange Weld	MT & UT	1 (divided into 2 halves)	100%	2	Deferral Permissible	0	0	2	ISI-2068A-E-04

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-A	B1.50	RV Beltline Repair Areas >10% Wall	N/A								
B-A	B1.51	RV Repair Welds Beltline Region	Volumetric	None	All	N/A	Deferral Permissible	N/A	N/A	N/A	
B-B		**Pressure Retaining Welds in Vessels Other than Reactor Vessels**									
B-B	B2.10	Pressurizer Shell-to-Head Welds									
B-B	B2.11	Pressurizer Circ. Shell-to-Head Welds	UT	2	100%	2	Deferral Not Permissible	0	1	1	ISI-2068C-E-01
B-B	B2.12	Pressurizer Shell-to-Head Intersecting Long Weld	UT	2 / 1 foot (one longitudinal weld)	1 foot of each	2 / 1 foot	Deferral Not Permissible	0	1 foot	1 foot	ISI-2068C-E-01
B-B	B2.20	Pressurizer Head Welds	N/A								

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-B	B2.21	Pressurizer Head Welds Circumferential	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.22	Pressurizer Head Welds Meridional	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.30	SG Primary Side Head Welds	N/A								
B-B	B2.31	SG Primary Side Head Welds Circumferential	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.32	SG Primary Side Head Welds Meridional	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.40	SG Tubesheet-to-Head Weld	UT	4 SG / 1 weld each	Tubesheet-to-Head Weld in 1 vessel	4	Deferral Not Permissible	1	2	1	ISI-2001-E-01
B-B	B2.50	Heat Exch Primary Side Head Welds	N/A								

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-B	B2.51	Heat Exch Primary Side Head Welds, Circumferential	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.52	Heat Exch Primary Side Head Welds, Meridional	Volumetric	None	One weld per head	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.60	Heat Exch Primary Side Shell Tubesheet-to-Head Welds	Volumetric	None	One weld per group, 100%	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.70	Heat Exch Primary Side Shell, Long. Welds	Volumetric	None	One foot of one weld per group	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-B	B2.80	Heat Exch Primary Side Shell, Tubesheet-to-Shell Welds	Volumetric	None	One weld per group at each end	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-D		**Full Penetration Welds of Nozzles in Vessels**									
B-D	B3.90	RV Nozzle-to-Vessel Welds	UT	8	100%	8	Deferral Partially Permissible	2	0	6	ISI-2068A-E-16, E-17
B-D	B3.100	RV Nozzle Inside Radius Section	UT	8	100%	8	Deferral Partially Permissible	2	0	6	ISI-2068A-E-16, E-17
B-D	B3.110	Pressurizer Nozzle-to-Vessel Welds	UT	6	100%	6	Deferral Not Permissible	2	2	2	ISI-2068C-E-01, E-03, E-04
B-D	B3.120 (Augmented by NRC)	Pressurizer Nozzle Inside Radius Section	UT or VT (enhanced - 1 mil wire per 10CFR50)	6	100%	6	Deferral Not Permissible	2	2	2	ISI-2068C-E-01, E-03, E-04
B-D	B3.130	SG Primary Side Nozzle-Vessel Welds	Volumetric	None	100%	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-D	B3.140 (Augmented by NRC)	SG Primary Side Nozzle Inside Radius Section	UT or VT (enhanced - 1 mil wire per 10CFR50)	8	100%	8	Deferral Not Permissible	2	3	3	ISI-2001-E-01
B-D	B3.150	Heat Exchanger Primary Side Nozzle-to-Vessel Welds	Volumetric	None	100%	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-D	B3.160	Heat Exchanger Primary Side Nozzle Inside Radius Section	Volumetric	None	100%	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-F		**Pressure Retaining Dissimilar Metal Welds -- subsumed by Risk-Informed Program - Category R-A, Code Case N-716-1. Also addressed by Code Case N-770-1, see Appendix K, Alloy 600 Table.**									
B-G-1		**Pressure Retaining Bolting, Greater Than 2" in Diameter**									
B-G-1	B6.10	RV Closure Head Nuts	VT-1	1 set of 54	100%	1	Deferral Permissible	0	0	1	ISI-2068A-E-09, E-10
B-G-1	B6.20	RV Closure Studs	UT	1 set of 54	100%	1	Deferral Permissible	0	0	1	ISI-2068A-E-09, E-10

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-1	B6.40	RV Threads in Flange	UT	1 set of 54	100%	1	Deferral Permissible	0	0	1	ISI-2068A-E-09, E-10
B-G-1	B6.50	RV Closure Washers, Bushings	VT-1	1 set of 54 Washers 4 Bushings	100%	1	Deferral Permissible	0	0	1 4	ISI-2068A-E-09, E-10
B-G-1	B6.60	Pressurizer Bolts and Studs	Volumetric	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.70	Pressurizer Flange Surface (disassembled)	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.80	Pressurizer Nuts, Bushings, and Washers	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.90	SG Bolts and Studs	Volumetric	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.100	SG Flange Surface (disassembled)	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-1	B6.110	SG Nuts, Bushings, and Washers	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.120	Heat Exch Bolts and Studs	Volumetric	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.130	Heat Exch Flange Surfaces (disassembled)	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.140	Heat Exch Nuts, Bushings, and Washers	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.150	Piping Bolts and Studs	Volumetric	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.160	Piping Flange Surfaces (disassembled)	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.170	Piping Nuts, Bushings, and Washers	Visual	None	100%	N/A	Deferral Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-1	B6.180	RCP Bolts and Studs	UT	4 Pumps / 24 bolts per Pump	25%	1 set of 24 bolts	Deferral Permissible	0	0	1	ISI-2068B-E-01
B-G-1	B6.190	RCP Flange Surface (disassembled)	VT-1	4 Pumps	Pump selected for exam under B-L-2	1 Pump	Deferral Permissible	when dis-assembled	when dis-assembled	when dis-assembled	ISI-2068B-E-01
B-G-1	B6.200	RCP Nuts, Bushings, and Washers	Visual	None	Pump selected for exam under B-L-2	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.210	Valve Bolts and Studs	Volumetric	None	Valve(s) selected for exam under B-M-2	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.220	Valve Flange Surface (disassembled)	Visual	None	Valve(s) selected for exam under B-M-2	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-G-1	B6.230	Valve Nuts, Bushings, and Washers	Visual	None	Valve(s) selected for exam under B-M-2	N/A	Deferral Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-2		**Pressure Retaining Bolting, 2" and Less in Diameter**									
B-G-2	B7.10	RV Bolts, Studs, and Nuts	VT-1	None	100%	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-G-2	B7.20	Pressurizer Bolts, Studs, and Nuts	VT-1	1 Manway / 16 Bolts	100%	1 Manway / 16 Bolts	Deferral Not Permissible	0	1 Manway	0	ISI-2068C-E-02
B-G-2	B7.30	SG Bolts, Studs, and Nuts	VT-1	4 SG / 2 Manways / 16 bolts ea.	100% 1 SG	1 SG / 2 Manways / 16 bolts ea.	Deferral Not Permissible	1 Manway	0	1 Manway	ISI-2001-E-02
B-G-2	B7.40	Heat Exch Bolts, Studs, and Nuts	VT-1	None	100%	None	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-G-2	B7.50	Piping Bolts, Studs, and Nuts									
B-G-2	B7.50	CVCS	VT-1	4 connections	When dis-assembled	4	Deferral Not Permissible	1 or when disassembled	1 or when disassembled	2 or when disassembled	ISI-2062-W series
B-G-2	B7.50	RCS	VT-1	5 connections	When dis-assembled	5	Deferral Not Permissible	2 or when disassembled	2 or when disassembled	1 or when disassembled	ISI-2068-W series
B-G-2	B7.50	RHRS	VT-1	None	When dis-assembled	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-2	B7.50	SIS	VT-1	4 connections	When dis-assembled	4	Deferral Not Permissible	1 or when disassembled	1 or when disassembled	2 or when disassembled	ISI-2063-W series
B-G-2	B7.60	Pumps Bolts, Studs, and Nuts	VT-1	4 Pumps / 2 sets / 1 set 12 bolts and 1 set 8 bolts	Pump(s) selected for exam under B-L-2	1 set 12 bolts and 1 set 8 bolts	Deferral Not Permissible	When dis-assembled	When dis-assembled	1 set 12 bolts and 1 set 8 bolts or when disassembled	ISI-2068B-E-01
B-G-2	B7.70	Valves Bolts, Studs, and Nuts	See Note 2 at end of Appendix A								
B-G-2	B7.70	CVCS	VT-1	None	Valve(s) selected for exam under B-M-2	N/A	Deferral Not Permissible	N/A	N/A	N/A	N/A
B-G-2	B7.70	RCS	VT-1	3 Valves (1 group)	Valve(s) selected for exam under B-M-2	At least 1 valve per group (1)	Deferral Not Permissible	0 or when disassembled	0 or when disassembled	1 valve in group or when disassembled	ISI-2068-W-04
B-G-2	B7.70	RHRS	VT-1	8 Valves (4 groups)	Valve(s) selected for exam under B-M-2	At least 1 valve per group (4)	Deferral Not Permissible	1 valve in 1 group or when disassembled	1 valve in 1 group or when disassembled (not in 1st period)	1 valve in each of 2 groups or when disassembled (not in 1st or 2nd period)	ISI-2074-W series

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-G-2	B7.70	SIS	VT-1	18 Valves (3 groups)	Valve(s) selected for exam under B-M-2	At least 1 valve per group (3)	Deferral Not Permissible	1 valve in 1 group or when disassembled	1 valve in 1 group or when disassembled (not in 1st period)	1 valve in 1 group or when disassembled (not in 1st or 2nd period)	ISI-2063-W series
B-J		**Pressure Retaining Welds in Piping -- subsumed by Risk-Informed Program - Category R-A, Code Case N-716-1. Also addressed by Code Case N-770-1.**									
B-K		**Welded Attachments for Vessels, Piping, Pumps, and Valves**									
B-K	B10.10	Pressure Vessels Welded Attachments	Surface								
B-K	B10.10	Reactor Vessel	MT	None	See Note 3 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-K	B10.10	Pressurizer Support Skirt	MT	1	See Note 3 at end of Appendix A	1	Deferral Not Permissible whenever component support deformation is identified	0	0	1	ISI-2068C-E-06
B-K	B10.10	Pressurizer Seismic Lugs	MT	1 PZR / 4 IAs	See Note 3 at end of Appendix A	0 (Support Skirt Selected)	Deferral Not Permissible whenever component support deformation is identified	0	0	0	ISI-2068C-E-06
B-K	B10.10	Steam Generator	MT	None	See Note 3 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A
B-K	B10.20	Piping Welded Attachments	Surface								

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-K	B10.20	CVCS	Surface	None	See Note 1 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A
B-K	B10.20	RCS	PT	2	See Note 1 at end of Appendix A	1	Deferral Not Permissible whenever component support deformation is identified	1	0	0	ISI-2068-H series
B-K	B10.20	RCS Main	Surface	None	See Note 1 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A
B-K	B10.20	RHRS	Surface	None	See Note 1 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-K	B10.20	SIS	Surface	1	See Note 1 at end of Appendix A	1	Deferral Not Permissible whenever component support deformation is identified	0	1	0	ISI-2063-H-10
B-K	B10.30	Pumps Welded Attachments	Surface	None	See Note 1 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A
B-K	B10.40	Valve Welded Attachments	Surface	None	See Note 1 at end of Appendix A	N/A	Deferral Not Permissible whenever component support deformation is identified	N/A	N/A	N/A	N/A
B-L-2		**Pump Casings**									
B-L-2	B12.20	Reactor Coolant Pump Casing Internal Surfaces	VT-3	4	1 Pump in each group	1	When Dis-assembled	When disassembled	When disassembled	When disassembled	ISI-2068B-E-03

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-M-2		**Valve Bodies**									
B-M-2	B12.50	Valves (greater than 4 NPS) Body Internal Surfaces	Visual	See Note 2 at end of Appendix A.							
B-M-2	B12.50	CVCS	VT-3	None	N/A	1 valve per group (0)	Only when disassembled	N/A	N/A	N/A	N/A
B-M-2	B12.50	RCS	VT-3	3 (One Group)	N/A	1 valve per group (1)	Only when disassembled	Only when disassembled	Only when disassembled	Only when disassembled	ISI-2068-W series
B-M-2	B12.50	RHRS	VT-3	8 (Four Groups)	N/A	1 valve per group (4)	Only when disassembled	Only when disassembled	Only when disassembled	Only when disassembled	ISI-2074-W series
B-M-2	B12.50	SIS	VT-3	18 (Three Groups)	N/A	1 valve per group (3)	Only when disassembled	Only when disassembled	Only when disassembled	Only when disassembled	ISI-2063-W series
B-N-1		**Interior of Reactor Vessel**									
B-N-1	B13.10	RV Interior Accessible Areas	VT-3	1	100% At 1st Refuel and At 3 year periods	1 At 1st Refuel and 1 each period	Deferral Not Permissible	1	1	1	ISI-2068A-E-02

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-N-2		**Integrally Welded Core Support Structure and Interior Attachments to Reactor Vessels**									
B-N-2	B13.50	RV Interior Attachments Within Beltline Region	Visual	None	Accessible Welds	N/A	Deferral Permissible	N/A	N/A	N/A	N/A
B-N-2	B13.60	RV Interior Attachments Beyond Beltline Region	VT-3	1 (6 locations)	Accessible Welds	1	Deferral Permissible	0	0	1	ISI-2068A-E-02
B-N-3		**Removable Core Support Structures**									
B-N-3	B13.70	RV Core Support Structure Accessible Surfaces	VT-3	1	Accessible Surfaces	1	Deferral Permissible	0	0	1	ISI-2068A-E-18
B-O		**Pressure Retaining Welds in Control Rod Housing**									
B-O	B14.20	RV Welds in CRD Housings	UT or PT See Note 8 at end of Appendix A	78 CRD Housings / 15 Peripheral Housings	10% of Peripheral CRD Housings	2	Deferral Permissible	0	0	2	ISI-2068A-E-04, E-07

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-O	B14.21	RV Welds in ICI Housings	UT or PT See Note 8 at end of Appendix A	78 CRD Housings / 5 Peripheral Housings	10% of Peripheral ICI Housings	1	Deferral Permissible	0	0	1	ISI-2068A-E-04, E-07
B-P		**Alloy 600 Reactor Vessel Upper Head Penetrations (Code Case N-729-1)**									
B-P	B4.10	Head with UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds	Visual, VE	79	100%	See Note 4	See Note 4	See Note 4	See Note 4	See Note 4	ISI-2068A-E-04 thru E-07
B-P	B4.20	UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds in head	Volumetric and/or Surface	79	100%	See Note 5	See Note 5	See Note 5	See Note 5	See Note 5	ISI-2068A-E-04 thru E-07
B-P	B4.30	Heads with nozzles and partial penetration welds of PWSCC-resistant material	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-P	B4.40	Nozzles and partial penetration welds of PWSCC-resistant material in heads	Volumetric Surface	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P		**Alloy 600 Locations; Code Case N-722-1 (See note 6)**									
B-P	B15.80	RPV bottom-mounted instrument penetrations	Visual, VE	1	N/A	3	Every other refueling outage (See note 7)	1	1	1	ISI-2068A-E-12, E-14
B-P	B15.90	RPV Hot leg nozzle-to-pipe connections	Visual, VE	4 (mitigated by MSIP)	N/A	N/A	N/A	N/A	N/A	N/A	ISI-2068A-E-16
B-P	B15.95	RPV Cold leg nozzle-to-pipe connections	Visual, VE	4 (mitigated by MSIP)	N/A	N/A	N/A	N/A	N/A	N/A	ISI-2068A-E-17
B-P	B15.100	RPV Instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.110	S/G Hot leg nozzle-to-pipe connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 1 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-P	B15.115	S/G Cold leg nozzle-to-pipe connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.120	S/G Bottom channel head drain tube connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.130	S/G Primary side hot leg instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.135	S/G Primary side cold leg instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.140	Pressurizer Heater penetrations	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.150	Pressurizer Spray nozzle-to-pipe connections	Visual, VE	1 (mitigated by MSIP)	100%	1	Deferral Not Permissible	1 (RFO1)	0	0	ISI-2068-W-04

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EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-P	B15.160	Pressurizer Safety and relief nozzle-to-pipe connections	Visual, VE	4 (mitigated by MSIP)	100%	4	Deferral Not Permissible	4 (RFO1)	2	2	ISI-2068-W-04
B-P	B15.170	Pressurizer Surge nozzle-to-pipe connections	Visual, VE	1 (mitigated by MSIP)	100%	1	Deferral Not Permissible	1 (RFO1)	0	0	ISI-2068-W-01
B-P	B15.180	Pressurizer Instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.190	Pressurizer Drain nozzle-to-pipe connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.200	Hot leg instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.205	Cold leg instrument connections	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-P	B15.210	Hot leg full penetration welds	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
B-P	B15.215	Cold leg full penetration welds	Visual, VE	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note 1: For Examination Category B-K, Piping, Pump, and Valve Integral Attachments the percentage examined during an inspection interval is based on 10% of the integral attachments on non-exempt piping (per system basis). 100% of the required areas of each selected welded attachment are required to be examined.

Note 2: Reference Appendix F for valve groupings and the list of valves subject to Examination Category B-G-2 or B-M-2 as applicable.

Note 3: For Examination Category B-K, Pressure Vessels Integral Attachments, only one integral attachment of one of multiple vessels is required to be examined. 100% of the required areas of each selected welded attachment are required to be examined.

Note 4: The visual examination and examination frequency shall be in accordance with **Code Case N-729-1**. The examination frequency may be extended to every third refueling outage or five calendar years. This is applicable provided an IWA-2212 VT-2 visual examination of the head is performed under the insulation through multiple access points in outages that the VE is not completed. This IWA-2212 VT-2 visual examination may be performed with the reactor vessel depressurized. See Table in Appendix K Section 4.0 for frequency details. In the database, B4.10a represents the VT-2 exam and B4.10b represents the VE.

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Note 5: The volumetric and surface examinations and examination frequency shall be in accordance with **Code Case N-729-1**. Based on the initial estimates of the RIY parameter, as determined by WBN calculation MDQ00106820070114 rev. 4, the reinspection frequency will be shorter than the maximum eight calendar year frequency, and re-examination must be performed prior to the end of the Cycle 4 refueling outage, before 6 calendar years. Future revisions to the referenced calculation may potentially extend the required frequency.

Note 6: The visual examination and examination frequency shall be in accordance with **Code Case N-722-1** unless conditioned by the NRC in 10CFR50. The NRC in 10CFR50.55a (g)(6)(ii)(E)(1) states that the inspection requirements of **ASME Code Case N-722-1** do not apply to components with pressure retaining weld fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement (SI). WBN-2 performed Mechanical Stress Improvement Process (MSIP) while still in the construction phase.

Note 7: An ultrasonic examination, performed from the component inside or outside surface in accordance with the requirements of table IWB-2500-1 and Appendix VIII (1995 Edition with 1996 Addenda or later) shall be acceptable in lieu of the visual examination requirements of this table.

Note 8: The surface examination method shall be performed on the inside diameter of the penetration nozzle housing welds as shown in Figure IWB-2500-18 for examination surface area C-D.

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-A		**Pressure Retaining Welds in Pressure Vessels - all Item Numbers except Steam Generators have been subsumed by Risk-Informed Program. See Category R-A.**									
	C1.10	Steam Generator	UT	4 (1 weld per SG)	Cylindrical Shell-to-Conical Shell Junction Weld in 1 vessel	1	Each Inspection Interval	0	0	1	ISI-2001-E-01
	C1.20	Steam Generator	UT	4 (1 weld per SG)	Head-to-Shell Weld in 1 vessel	1	Each Inspection Interval	0	1	0	ISI-2001-E-01
	C1.30	Steam Generator	UT	4 SG / 1 weld per SG	Tubesheet-to-Shell Weld in 1 vessel	1	Each Inspection Interval	1	0	0	ISI-2001-E-01
C-B		**Pressure Retaining Nozzle Welds in Vessels -- subsumed by Risk-Informed Program. See Category R-A, Code Case N-716-1.**									

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C		**Welded Attachments for Vessels, Piping, Pumps, and Valves**									
C-C	C3.10	Pressure Vessels Welded Attachments	Surface								
C-C	C3.10	Steam Generator	Surface	None	See Note 2 at the end of Appendix B.	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
C-C	C3.10	Residual Heat Removal Heat Exchanger	PT	4 (2 IAs on each RHRHX)	See Note 2 at the end of Appendix B.	1 IA on one RHRHX	Each Inspection Interval and whenever component support deformation is identified	0	1	0	ISI-2074B-E-01

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.10	Containment Spray Heat Exchanger	PT	2 (1 IA on each CSHX)	See Note 2 at the end of Appendix B.	1 IA on one CSHX	Each Inspection Interval and whenever component support deformation is identified	0	0	1	ISI-2072B-E-01
C-C	C3.10	Seal Water Heat Exchanger	PT	N/A	See Note 2 at the end of Appendix B.	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	ISI-2062B-E-02
C-C	C3.10	Seal Water Filter	PT	N/A	See Note 2 at the end of Appendix B.	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	ISI-2062D-E-01

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.10	Seal Water Injection Filter	PT	2 (1 IA on each SWIF)	See Note 2 at the end of Appendix B.	1 IA on one SWIF	Each Inspection Interval and whenever component support deformation is identified	0	1	0	ISI-2062C-E-01
C-C	C3.10	Boron Injection Tank	PT	4 (1 BIT / 4 IAs)	See Note 2 at the end of Appendix B.	1 IA on the BIT	Each Inspection Interval and whenever component support deformation is identified	0	1	0	ISI-2063A-E-01
C-C	C3.20	Piping Weld Attachments	Surface								
C-C	C3.20	AFWS	MT	13	See Note 1 at end of Appendix B (10%)	2	Each Inspection Interval and whenever component support deformation is identified	1	0	1	ISI-2003B-H series

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.20	CSS	PT	19	See Note 1 at end of Appendix B (10%)	2	Each Inspection Interval and whenever component support deformation is identified	1	0	1	ISI-2072-H series
C-C	C3.20	CVCS	PT	27	See Note 1 at end of Appendix B (10%)	3	Each Inspection Interval and whenever component support deformation is identified	1	1	1	ISI-2062-H series
C-C	C3.20	FWS	Surface	2	See Note 1 at end of Appendix B (10%)	1	Each Inspection Interval and whenever component support deformation is identified	0	1	0	ISI-2003B-H series

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.20	MSS	MT	12	See Note 1 at end of Appendix B (10%)	2	Each Inspection Interval and whenever component support deformation is identified	0	1	1	ISI-2001-H series
C-C	C3.20	RHRS	PT	12	See Note 1 at end of Appendix B (10%)	2	Each Inspection Interval and whenever component support deformation is identified	1	0	1	ISI-2074-H series
C-C	C3.20	SIS	PT	36	See Note 1 at end of Appendix B (10%)	4	Each Inspection Interval and whenever component support deformation is identified	1	2	1	ISI-2063-H series
C-C	C3.30	Pump Welded Attachments	Surface								

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.30	Centrifugal Charging Pump (CCP)	PT	2 (4 welds on each CCP)	See Note 1 at end of Appendix B (10%)	All IAs on one CCP	Each Inspection Interval and whenever component support deformation is identified	0	1 CCP (4 IAs)	0	ISI-2062A-E-01
C-C	C3.30	Containment Spray Pump	Surface	None	See Note 1 at end of Appendix B (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
C-C	C3.30	Residual Heat Removal Pump (RHRP)	PT	2 (3 IAs on each RHRP)	See Note 1 at end of Appendix B (10%)	All IAs on one RHRP	Each Inspection Interval and whenever component support deformation is identified	0	0	1 RHRP (3 IAs)	ISI-2074A-E-01

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EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-C	C3.30	Safety Injection Pump	Surface	None	See Note 1 at end of Appendix B (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
C-C	C3.40	Valve Welded Attachments	Surface	None	See Note 1 at end of Appendix B (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
C-D		**Pressure Retaining Bolting greater than 2-inches in Diameter -- subsumed by Risk-Informed Program Also addressed by Code Case N-770-1.**					N/A				
C-D	C4.10	Pressure Vessel Bolts and Studs >2” diameter	Volumetric or Surface when dis-assembled	N/A							

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-D	C4.10	Steam Generator	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.10	Residual Heat Removal Heat Exchanger	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.10	Containment Spray Heat Exchanger	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.10	Seal Water Heat Exchanger	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.10	Seal Water Filter	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.10	Seal Water Injection Filter	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 2 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
C-D	C4.10	Boron Injection Tank (BIT)	UT or MT	N/A	100% of one connection of 1 component	N/A	N/A	N/A	N/A	N/A	N/A
C-D	C4.20	Piping Bolts and Studs > 2” dia.	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.30	Pumps Bolts and Studs > 2” dia.	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-D	C4.40	Valves Bolts and Studs > 2” dia.	Volumetric or Surface when dis-assembled	None	100% of one connection of 1 component	N/A	Each Inspection Interval	N/A	N/A	N/A	N/A
C-F-1		**Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping -- subsumed by Risk-Informed Program. See Category R-A, Code Case N-716-1.**									
C-F-2		**Pressure Retaining Welds in Carbon or Low Alloy Steel Piping -- subsumed by Risk-Informed Program. See Category R-A, Code Case N-716-1.**									

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ISI Planning/Scheduling Table for ASME Class 2 Components

Note 1: For Examination Category C-C, Piping, Pump, and Valve Integral Attachments, the percentage examined during an inspection interval is based on 10% of the integral attachments associated with the component supports selected for examination under IWF-2510. 100% of the required areas of each selected welded attachment are required to be examined.

Note 2: For Examination Category C-C, Pressure Vessel Integral Attachments, only one integral attachment of only one of the multiple vessels of similar design, function, and service is required to be examined. 100% of the required areas of each selected welded attachment are required to be examined.

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A		**Integral Attachments for Class 3 Vessels, Piping, Pumps, and Valves**									
D-A	D1.10	Pressure Vessels Integrally Welded Attachments	Visual								
D-A	D1.10	Containment Spray Heat Exchanger (CSHX)	VT-1	2 (1 IA on each CSHX)	See Note 2 at the end of Appendix C.	All IAs on 1 CSHX	Each Inspection Interval and whenever component support deformation is identified	0	0	All IAs on 1 CSHX	ISI-2072B-E-02
D-A	D1.10	Nonregenerative Letdown Heat Exchanger (NRLHX)	VT-1	N/A	See Note 2 at the end of Appendix C.	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A (Exempt)

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A	D1.10	Component Cooling Surge Tank (CCST)	VT-1	1	See Note 2 at the end of Appendix C.	1 IA on the CCST	Each Inspection Interval and whenever component support deformation is identified	0	1 IA on the CCST	0	ISI-0496-C series
D-A	D1.10	Essential Raw Cooling Water System Strainer (ERCWS)	VT-1	4 (two ERCWSs with 2 IAs each)	See Note 2 at the end of Appendix C.	All IAs on one ERCWS	Each Inspection Interval and whenever component support deformation is identified	All IAs on one ERCWS	0	0	ISI-0489-C series
D-A	D1.10	Component Cooling Heat Exchanger (CCHX)	VT-1	3	See Note 2 at the end of Appendix C.	All IAs on 1 CCHX	Each Inspection Interval and whenever component support deformation is identified	0	All IAs on 1 CCHX	0	ISI-0494-C series

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A	D1.10	RHR Heat Exchanger (RHRSHX)	VT-1	2 (1 IA per RHRSHX)	See Note 2 at the end of Appendix C.	All IAs on 1 RHRSHX	Each Inspection Interval and whenever component support deformation is identified	0	0	All IAs on 1 RHRSHX	ISI-2074B-E-02
D-A	D1.10	Seal Water Heat Exchanger (SWHX)	VT-1	N/A	See Note 2 at the end of Appendix C.	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	ISI-2062B-E-02 N/A (Exempt)
D-A	D1.20	Piping Integrally Welded Attachments	Visual								
D-A	D1.20	AFWS	VT-1	5	See Note 1 at end of Appendix C (10%)	1	Each Inspection Interval and whenever component support deformation is identified	0	0	1	ISI-2003B-H series

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A	D1.20	CCS	VT-1	5	See Note 1 at end of Appendix C (10%)	1	Each Inspection Interval and whenever component support deformation is identified	1	0	0	ISI-2070-H series
D-A	D1.20	ERCWS	VT-1	24	See Note 1 at end of Appendix C (10%)	3	Each Inspection Interval and whenever component support deformation is identified	1	1	1	ISI-2067-H series
D-A	D1.30	Pumps Integrally Welded Attachments	Visual								
D-A	D1.30	Motor Driven Auxiliary Feedwater Pump	VT-1	None	See Note 1 at end of Appendix C (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A	D1.30	Turbine Driven Auxiliary Feedwater Pump	VT-1	None	See Note 1 at end of Appendix C (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
D-A	D1.30	Component Cooling System Pump	VT-1	None	See Note 1 at end of Appendix C (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A
D-A	D1.30	ERCW Pump	VT-1	None	See Note 1 at end of Appendix C (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A

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ISI Planning/Scheduling Table for ASME Class 3 Components

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
D-A	D1.40	Valve Integrally Welded Attachments	VT-1	None	See Note 1 at end of Appendix C (10%)	N/A	Each Inspection Interval and whenever component support deformation is identified	N/A	N/A	N/A	N/A

Note 1: For Examination Category D-A, Piping, Pump and Valve Integral Attachments, the percentage examined during an inspection interval is based on 10% of the integral attachments on non-exempt piping (per system basis) or whenever component support degradation is identified. 100% of the required areas of each selected welded attachment are required to be examined.

Note 2: for Examination Category D-A, Pressure Vessel Integral Attachments the attachments of only one of the multiple vessels of similar design, function, and service shall be required to be examined. For single vessels, only one welded attachment shall be selected for examination. The attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, shall be an attachment under continuous load during normal system operation, or an attachment subject to a potential intermittent load (seismic, water hammer, etc.) during normal system operation if an attachment under continuous load does not exist.

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A		**Supports**									
F-A	F1.10X (See Note 1)	Class 1 Piping Supports	Visual								
F-A		Class 1 CVC Piping Supports									
F-A	F1.10A	CVCS	VT-3	26	25%	7	Each Inspection Interval	2	3	2	ISI-2062-H series
F-A	F1.10B	CVCS	VT-3	18	25%	5	Each Inspection Interval	2	1	2	ISI-2062-H series
F-A	F1.10C	CVCS	VT-3	3	25%	1	Each Inspection Interval	0	0	1	ISI-2062-H series
F-A	F1.10D	CVCS	VT-3	13	25%	4	Each Inspection Interval	1	2	1	ISI-2062-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A		Class 1 RCS Piping Supports									
F-A	F1.10A	RCS	VT-3	11	25%	3	Each Inspection Interval	1	1	1	ISI-2068-H series
F-A	F1.10B	RCS	VT-3	8	25%	2	Each Inspection Interval	1	1	0	ISI-2068-H series
F-A	F1.10C	RCS	VT-3	9	25%	3	Each Inspection Interval	1	1	1	ISI-2068-H series
F-A	F1.10D	RCS	VT-3	17	25%	5	Each Inspection Interval	2	1	2	ISI-2068-H
F-A		Class 1 RHR Piping Supports									
F-A	F1.10A	RHRS	VT-3	3	25%	1	Each Inspection Interval	1	0	0	ISI-2074-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.10B	RHRS	VT-3	4	25%	1	Each Inspection Interval	0	0	1	ISI-2068-H series
F-A	F1.10C	RHRS	VT-3	6	25%	2	Each Inspection Interval	1	1	0	ISI-2068-H series
F-A	F1.10D	RHRS	VT-3	10	25%	3	Each Inspection Interval	1	1	1	ISI-2068-H series
F-A		Class 1 SIS Piping Supports									
F-A	F1.10A	SIS	VT-3	41	25%	11	Each Inspection Interval	3	4	4	ISI-2063-H series
F-A	F1.10B	SIS	VT-3	64	25%	16	Each Inspection Interval	5	5	6	ISI-2063-H series
F-A	F1.10C	SIS	VT-3	11	25%	3	Each Inspection Interval	1	1	1	ISI-2063-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.10D	SIS	VT-3	24	25%	6	Each Inspection Interval	2	2	2	ISI-2063-H
F-A	F1.20X (See Note 1)	Class 2 Piping Supports	Visual								
F-A		Class 2 AFWS Piping Supports									
F-A	F1.20A	AFWS	VT-3	82	15%	13	Each Inspection Interval	5	4	4	ISI-2003B-H series
F-A	F1.20B	AFWS	VT-3	67	15%	11	Each Inspection Interval	4	3	4	ISI-2003B-H series
F-A	F1.20C	AFWS	VT-3	11	15%	2	Each Inspection Interval	0	1	1	ISI-2003B-H series
F-A	F1.20D	AFWS	VT-3	32	15%	5	Each Inspection Interval	1	2	2	ISI-2003B-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A		Class 2 CSS Piping Supports									
F-A	F1.20A	CSS	VT-3	80	15%	12	Each Inspection Interval	4	4	4	ISI-2072-H series
F-A	F1.20B	CSS	VT-3	51	15%	8	Each Inspection Interval	3	2	3	ISI-2072-H series
F-A	F1.20C	CSS	VT-3	10	15%	2	Each Inspection Interval	0	1	1	ISI-2072-H series
F-A	F1.20D	CSS	VT-3	14	15%	3	Each Inspection Interval	1	1	1	ISI-2072-H series
F-A		Class 2 CVCS Piping Supports									
F-A	F1.20A	CVCS	VT-3	131	15%	20	Each Inspection Interval	7	7	6	ISI-2062-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.20B	CVCS	VT-3	146	15%	22	Each Inspection Interval	7	8	7	ISI-2062-H series
F-A	F1.20C	CVCS	VT-3	8	15%	2	Each Inspection Interval	0	1	1	ISI-2062-H series
F-A	F1.20D	CVCS	VT-3	7	15%	2	Each Inspection Interval	1	0	1	ISI-2062-H series
F-A		Class 2 FWS Piping Supports									
F-A	F1.20A	FWS	VT-3	21	15%	4	Each Inspection Interval	1	2	1	ISI-2003A-H series
F-A	F1.20B	FWS	VT-3	5	15%	1	Each Inspection Interval	0	1	0	ISI-2003A-H series
F-A	F1.20C	FWS	VT-3	0	15%	0	Each Inspection Interval	0	0	0	ISI-2003A-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.20D	FWS	VT-3	10	15%	2	Each Inspection Interval	1	0	1	ISI-2003A-H
F-A		Class 2 MSS Piping Supports									
F-A	F1.20A	MSS	VT-3	17	15%	3	Each Inspection Interval	1	1	1	ISI-2001-H series
F-A	F1.20B	MSS	VT-3	1	15%	1	Each Inspection Interval	0	1	0	ISI-2001-H series
F-A	F1.20C	MSS	VT-3	13	15%	2	Each Inspection Interval	0	1	1	ISI-2001-H series
F-A	F1.20D	MSS	VT-3	28	15%	5	Each Inspection Interval	1	2	2	ISI-2001-H series
F-A		Class 2 RHRS Piping Supports									

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.20A	RHRS	VT-3	76	15%	12	Each Inspection Interval	4	4	4	ISI-2074-H series
F-A	F1.20B	RHRS	VT-3	20	15%	3	Each Inspection Interval	1	1	1	ISI-2074-H series
F-A	F1.20C	RHRS	VT-3	14	15%	3	Each Inspection Interval	1	1	1	ISI-2074-H series
F-A	F1.20D	RHRS	VT-3	17	15%	3	Each Inspection Interval	1	1	1	ISI-2074-H series
F-A		Class 2 SIS Piping Supports									
F-A	F1.20A	SIS	VT-3	138	15%	21	Each Inspection Interval	7	7	7	ISI-2063-H series
F-A	F1.20B	SIS	VT-3	139	15%	21	Each Inspection Interval	7	7	7	ISI-2063-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.20C	SIS	VT-3	17	15%	3	Each Inspection Interval	1	1	1	ISI-2063-H
F-A	F1.20D	SIS	VT-3	28	15%	5	Each Inspection Interval	1	2	2	ISI-2063-H series
F-A	F1.30X (See Note 1)	Class 3 Piping Supports	Visual								
F-A		Class 3 AFWS Piping Supports									
F-A	F1.30A	AFWS	VT-3	27	10%	3	Each Inspection Interval	1	1	1	ISI-203B3-H series
F-A	F1.30B	AFWS	VT-3	12	10%	2	Each Inspection Interval	1	0	1	ISI-203B3-H series
F-A	F1.30C	AFWS	VT-3	4	10%	1	Each Inspection Interval	0	1	0	ISI-203B3-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.30D	AFWS	VT-3	0	10%	0	Each Inspection Interval	0	0	0	ISI-203B3-H series
F-A		Class 3 CCS Piping Supports									
F-A	F1.30A	CCS	VT-3	58	10%	6	Each Inspection Interval	2	2	2	ISI-2070-H series
F-A	F1.30B	CCS	VT-3	39	10%	4	Each Inspection Interval	1	2	1	ISI-2070-H series
F-A	F1.30C	CCS	VT-3	7	10%	1	Each Inspection Interval	0	1	0	ISI-2070-H series
F-A	F1.30D	CCS	VT-3	1	10%	1	Each Inspection Interval	0	1	0	ISI-2070-H series

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A		Class 3 ERCWS Piping Supports									
F-A	F1.30A	ERCWS	VT-3	76	10%	8	Each Inspection Interval	2	3	2	ISI-2067-H series
F-A	F1.30B	ERCWS	VT-3	84	10%	9	Each Inspection Interval	3	3	3	ISI-2067-H series
F-A	F1.30C	ERCWS	VT-3	8	10%	1	Each Inspection Interval	0	1	0	ISI-2067-H series
F-A	F1.30D	ERCWS	VT-3	1	10%	1	Each Inspection Interval	0	1	0	ISI-2067-H series
F-A	F1.40X (See Note 2)	Class 1, 2, or 3 supports other than piping supports	Visual		Supports on one or one of multiple components						
F-A	**Class 1 Equipment**										

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.41A	CVCS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.41B	Class 1 Reactor Vessel	VT-3	Reactor Vessel / 1 support	All	Reactor Vessel / 1 support	Each Inspection Interval	0	0	Reactor Vessel / 1 support	ISI-2068A-E-11
F-A	F1.41B	Class 1 CRDM Seismic Support	VT-3	CRDM / 1 support	All	CRDM / 1 support	Each Inspection Interval	0	0	CRDM / 1 support	ISI-2068A-E-19
F-A	F1.41B	Class 1 Pressurizer	VT-3	Pressurizer / 2 supports	All	Pressurizer / 2 supports	Each Inspection Interval	0	Pressurizer / 1 support (seismic)	Pressurizer / 1 support (skirt)	ISI-2068C-E-06
F-A	F1.41B	Class 1 Steam Generator	VT-3	4 SG / 1 support each	One SG	One SG / 1 support	Each Inspection Interval	0	0	One SG / 1 support	ISI-2001-E-03
F-A	F1.41B	Class 1 Reactor Coolant Pump	VT-3	4 RCP / 1 support each	One Pump	1 RCP / 1 support	Each Inspection Interval	0	1 RCP / 1 support	0	ISI-2068B-E-05

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
	Class 1 Valves			Note: Schedule the F1.40X exam with the corresponding system F1.10X exams.							
F-A	F1.41D	CVCS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.41D	RCS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	**Class 2 Equipment**										
F-A	F1.42B	Class 2 Steam Generator	VT-3	4 SGs / 1 support each. **See Section 6.0 of Appendix K**	4 SGs	1 SG support each SG	Each Refueling Outage	4 SG supports each Refueling Outage	4 SG supports each Refueling Outage	4 SG supports each Refueling Outage	ISI-2001-E-03
F-A	F1.42B	Class 2 RHR Heat Exchanger	VT-3	2 RHRHX / 1 support each	1 RHRHX	1 RHRHX support	Each Inspection Interval	0	1 RHRHX support	0	ISI-2074B-E02
F-A	F1.42B	Class 2 CSS Heat Exchanger	VT-3	2 CSHX / 1 support each	1 CSHX	1 CSHX support	Each Inspection Interval	0	0	1 CSHX support	ISI-2072B-E-02

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.42B	Class 2 Seal Water Heat Exchanger	VT-3	Seal Water Heat Exch / 1 support	All	Seal Water Heat Exch support	Each Inspection Interval	0	Seal Water Heat Exch support	0	ISI-2062B-E-02
F-A	F1.42B	Class 2 Seal Water Filter	VT-3	Seal Water Filter / 1 support	All	Seal Water Filter support	Each Inspection Interval	0	Seal Water Filter support	0	ISI-2062D-E-02
F-A	F1.42B	Class 2 Seal Water Injection Filter	VT-3	2 Seal Water Injection Filters / 1 support	All	1 Seal Water Injection Filter support	Each Inspection Interval	1 Seal Water Injection Filter support	0	0	ISI-2062C-E-02
F-A	F1.42B	Class 2 Boron Injection Tank (BIT)	VT-3	BIT / 1 support	All	BIT support	Each Inspection Interval	0	BIT support	0	ISI-2063A-E-01
F-A	F1.42B	Class 2 RHR Pump	VT-3	2 RHRP / 1 support each	1 Pump	1 RHRP support	Each Inspection Interval	0	0	1 RHRP support	ISI-2074A-E-01
F-A	F1.42B	Class 2 Centrifugal Charging Pump	VT-3	2 CCP / 1 support each	1 Pump	1 CCP support	Each Inspection Interval	1 CCP support	0	0	ISI-2062A-E-01
F-A	F1.42B	Class 2 Safety Injection Pump	VT-3	2 SIP / 1 support each	1 Pump	1 SIP support	Each Inspection Interval	0	1 SIP support	0	ISI-2063A-E-01

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
v	F1.42B	Class 2 Containment Spray Pump	VT-3	2 CSP / 1 support each	1 Pump	1 CSP support	Each Inspection Interval	0	0	1 CSP support	ISI-2072A-E-01
F-A	**Class 2 Valves**		Note: Schedule the F1.40X exam with the corresponding system F1.20X exams.								
F-A	F1.42A	CSS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.42C	CSS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.42D	CVCS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.42D	FWS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A
F-A	F1.42D	SIS	VT-3	0	100%	0	Each Inspection Interval	0	0	0	N/A

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	**Class 3 Equipment**										
F-A	F1.43B	Class 3 Motor Driven Auxiliary Feedwater Pump (MDAFWP)	VT-3	2 (1 support on each MDAFWP)	1 Pump	1 MDAFWP support	Each Inspection Interval	0	0	1 MDAFWP support	ISI-2003B-E-02
F-A	F1.43B	Class 3 Turbine Driven Auxiliary Feedwater Pump (TDAFWP)	VT-3	1	1 Pump	1 TDAFWP support	Each Inspection Interval	0	0	1 TDAFWP support	ISI-2003B-E-03
F-A	F1.43B	Class 3 Component Cooling Surge Tank (CCST)	VT-3	1	All	CCST support	Each Inspection Interval	0	CCST support	0	ISI-0496-C Series
F-A	F1.43B	Class 3 CCS Heat Exchanger (CCHX)	VT-3	3 (1 support on each CCHX)	1 CCHX	1 CCHX support	Each Inspection Interval	0	1 CCHX support	0	ISI-0494-C Series
F-A	F1.43B	Class 3 CCS Water Pumps (CCSWP)	VT-3	5 (1 support on each CCSWP)	1 CCSWP	1 CCSWP support	Each Inspection Interval	0	1 CCSWP support	0	ISI-0495-C Series
F-A	F1.43B	Class 3 Nonregenerative Letdown Heat Exchanger (NRLHX)	VT-3	0	All	0	Each Inspection Interval	0	0	0	N/A (Exempt)

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD	NUMBER TO BE EXAMINED IN THE SECOND PERIOD	NUMBER TO BE EXAMINED IN THE THIRD PERIOD	ISI DRAWING NUMBER
F-A	F1.43B	Class 3 RHR Heat Exchanger Secondary Side (RHRHX)	VT-3	2 (1 support on each RHRHX)	1 RHRHX	1 RHRHX support	Each Inspection Interval	0	0	1 RHRHX support	ISI-2074B-E-02
F-A	F1.43B	Class 3 Containment Spray Heat Exchanger (CSHX)	VT-3	2 (1 support on each CSHX)	1 CSHX	1 CSHX support	Each Inspection Interval	0	0	1 CSHX support	ISI-2072B-E-02
F-A	F1.43B	Class 3 ERCW Pump (ERCWP)	VT-3	8 (1 support on each ERCWP)	1 ERCWP	1 ERCWP support	Each Inspection Interval	0	0	1 ERCWP support	ISI-0488-C Series
F-A	F1.43B	Class 3 ERCW Screen Wash Pump (ERCWSWP)	VT-3	4 (1 support on each ERCWSWP)	1 ERCWSWP	1 ERCWSWP support	Each Inspection Interval	0	1 ERCWSWP support	0	ISI-0490-C Series
F-A	F1.43B	Class 3 ERCW Strainer (ERCWS)	VT-3	4(1 support on each ERCWS)	1 ERCWS	1 ERCWS support	Each Inspection Interval	1 ERCWS support	0	0	ISI-0489-C Series
F-A	F1.43B	Class 3 Seal Water Heat Exchanger (SWHX)	VT-3	0	All	0	Each Inspection Interval	0	0	0	ISI-2062B-E-01 (Exempt)

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ISI Planning/Scheduling Table for ASME Class 1, 2, and 3 Component Supports

Note 1: In accordance with Table IWF-2500-1, Item Numbers have been categorized to identify support types by component support function as follows (the "Y" in F1.Y0X is 1, 2, or 3 as appropriate for the associated piping classification):

Item No. F1.Y0A - one directional restraints (Function A)
Item No. F1.Y0B - multidirectional restraints (Function B)
Item No. F1.Y0C - variable supports such as: springs and constant force (Function C)
Item No. F1.Y0D - snubbers (Function D), portions of supports that contain snubbers, but outside of the snubber pins

Note 2: In accordance with Table IWF-2500-1, Item Numbers have been categorized to identify support types by component support function as follows (the "Y" in F1.4YX is 1, 2, or 3 as appropriate for the associated piping classification):

Item No. F1.4YA - one directional restraints (Function A)
Item No. F1.4YB - multidirectional restraints (Function B)
Item No. F1.4YC - variable supports such as: springs and constant force (Function C)
Item No. F1.4YD - snubbers (Function D), portions of supports that contain snubbers, but outside of the snubber pins

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Risk-Informed Piping Welds

EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD (see Note 2)	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER REQUIRED TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE SECOND PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE THIRD PERIOD (Note 1)	ISI DRAWING NUMBER
R-A		**High-Safety-Significant Piping Structural Elements**									
R-A	R1.11	Elements Subject to Thermal Fatigue	Volumetric	70 --- CVC - 13 FWS - 14 RCS - 36 RHR - 7	N/A	27 --- CVC - 6 FWS - 6 RCS - 13 RHR - 2	Deferral Not Permissible	9	9	9	ISI-2062-W ISI-2003-W ISI-2068-W ISI-2074-W Series
R-A	R1.12	Elements Subject to High Cycle Mechanical Fatigue Not Used	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R-A	R1.13	Elements Subject to Erosion-Cavitation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R-A	R1.14	Elements Subject to Crevice Corrosion Cracking	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD (see Note 2)	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER REQUIRED TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE SECOND PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE THIRD PERIOD (Note 1)	ISI DRAWING NUMBER
R-A	R1.15	Elements Subject to Primary Water Stress Corrosion Cracking (PWSCC)	Volumetric	2 ---------- PZR SEs	N/A	1 ---------- PZR SEs	Deferral Not Permissible	0 (ASME XI, & **Code Cases N-722-1 & 770-1**, & Cat B-D)	4 (ASME XI, & **Code Cases N-722-1 & 770-1**, & Cat B-D)	2 (ASME XI, & **Code Cases N-722-1 & 770-1**, & Cat B-D)	ISI-2068-W Series
R-A	R1.16	Elements Subject to Intergranular or Transgranular Stress Corrosion Cracking (IGSCC) (No TGSCC)	Volumetric	16 ---------- SIS - 16	N/A	13 ---------- SIS - 13	Deferral Not Permissible	4	5	4	ISI-2063-W Series
R-A	R1.17	Elements Subject to localized Microbiologically-Induced Corrosion (MIC) or Pitting (Note 3)	VT-3 of Internal Surfaces or Volumetric	10 Flood Event ---------- HPFP - 6 RCW - 4	N/A	10 ---------- HPFP - 6 RCW - 4	Deferral Not Permissible	Per the MIC Program	Per the MIC Program	Per the MIC Program	N/A Per the MIC Program
R-A	R1.18	Elements Subject to Flow Accelerated Corrosion (FAC)	In accordance with FAC program	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A

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EXAM CAT.	ITEM NO.	DESCRIPTION	EXAM METHOD (see Note 2)	NUMBER OF COMPONENTS IN ITEM NO.	% TO BE EXAMINED DURING INTERVAL	NUMBER REQUIRED TO BE EXAMINED IN THE INTERVAL	FREQENCY OF EXAMINATION OR DEFERRAL OF INSPECTION TO END OF INTERVAL	NUMBER TO BE EXAMINED IN THE FIRST PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE SECOND PERIOD (Note 1)	NUMBER TO BE EXAMINED IN THE THIRD PERIOD (Note 1)	ISI DRAWING NUMBER
R-A	R1.19	Elements Subject to External Chloride Stress Corrosion Cracking (ECSCC)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R-A	R1.20	Elements <u>not</u> Subject to a Degradation Mechanism	Volumetric	1037 ---------- CVC - 217 FWS - 91 RCS - 226 RHR - 82 RV - on CRDM 5 & UPIAH - 8 SIS - 408	N/A	82 ---------- CVC - 18 FWS - 5 RCS - 18 RHR - 9 RV - on CRDM 2 & UPIAH - 2 SIS - 30	Deferral Not Permissible	27	28	27	ISI-2062-W ISI-2003-W ISI-2068-W ISI-2074-W ISI-2068-W ISI-2063-W Series

Note 1: The number of examinations in each Inspection Period are stated in ASME Code Section XI, IWB-2411 and IWC-2411, essentially equally-spaced per Period throughout the Interval, except for Item Number R1.17, which is determined solely by the MIC Program.

Note 2: Socket welds in examination Category R-A require a volumetric examination and a VT-2 of the fitting. The VT-2 Examination for these socket welds will be performed and recorded as part of 2-TRI-68-6, System Leakage Test Reactor Coolant System, or 2-TRI-68-901, Reactor Coolant System Leakage Test In Lieu of Hydrostatic Testing.

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Note 3: With the implementation of ASME Code Case N-716-1 for Risk-Informed ISI, ten non-Code piping areas have been identified as High Safety Significant due to flooding concerns and have been added to the ISI Program. These areas are inspected per the MIC Program, 0-TI-31.013 (ref. 2.5.A.18). The examination results from the MIC Program are provided to the ISI Engineer for incorporation into each ISI outage report (IWA-6000).

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Class 1 Valve Bodies (B-M-2) Valve Listing

NOTES

1) Examination is limited to at least one valve in each group of valves per interval.
2) Examination of valve pressure retaining bolting (B-G-2) should also be performed during the B-M-2 exam.

CLASS 1 EXAMINATION CATEGORY B-M-2 VALVE LISTING

SYS	VALVE	ISI DRAWING	SIZE (in.)	TYPE	FUNCTION	GROUP	VENDOR	VENDOR DRAWING
SIS	FCV-63-067	ISI-2063-W-08	10	GATE	ISOLATION	1	WESTINGHOUSE	115E013
SIS	FCV-63-080	ISI-2063-W-07	10	GATE	ISOLATION	1	WESTINGHOUSE	115E013
SIS	FCV-63-98	ISI-2063-W-06	10	GATE	ISOLATION	1	WESTINGHOUSE	115E013
SIS	FCV-63-118	ISI-2063-W-09	10	GATE	ISOLATION	1	WESTINGHOUSE	115E013
SIS	63-558	ISI-2063-W-10	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-559	ISI-2063-W-10	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-632	ISI-2063-W-06	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-633	ISI-2063-W-09	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-634	ISI-2063-W-07	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-635	ISI-2063-W-08	6	CKV	PSIV	2	WESTINGHOUSE	934D185
SIS	63-560	ISI-2063-W-09	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-561	ISI-2063-W-06	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-562	ISI-2063-W-07	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-563	ISI-2063-W-08	10	CKV	PSIV	3	WESTINGHOUSE	934D187

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Class 1 Valve Bodies (B-M-2) Valve Listing

CLASS 1 EXAMINATION CATEGORY B-M-2 VALVE LISTING								
SYS	VALVE	ISI DRAWING	SIZE (in.)	TYPE	FUNCTION	GROUP	VENDOR	VENDOR DRAWING
SIS	63-622	ISI-2063-W-09	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-623	ISI-2063-W-06	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-624	ISI-2063-W-07	10	CKV	PSIV	3	WESTINGHOUSE	934D187
SIS	63-625	ISI-2063-W-08	10	CKV	PSIV	3	WESTINGHOUSE	934D187
RHR	63-640	ISI-2074-W-08	8	CKV	PSIV	4	WESTINGHOUSE	934D186
RHR	63-643	ISI-2074-W-09	8	CKV	PSIV	4	WESTINGHOUSE	934D186
RHR	63-641	ISI-2074-W-08	6	CKV	PSIV	5	WESTINGHOUSE	934D185
RHR	63-644	ISI-2074-W-09	6	CKV	PSIV	5	WESTINGHOUSE	934D185
RCS	68-563	ISI-2068-W-04	6	RELIEF	RELIEF VALVE	6	CROSBY	DSCA56964
RCS	68-564	ISI-2068-W-04	6	RELIEF	RELIEF VALVE	6	CROSBY	DSCA56964
RCS	68-565	ISI-2068-W-04	6	RELIEF	RELIEF VALVE	6	CROSBY	DSCA56964
RHR	FCV-74-01	ISI-2074-W-01	14	GATE	PSIV	7	WESTINGHOUSE	115E622
RHR	FCV-74-02	ISI-2074-W-01	14	GATE	PSIV	7	WESTINGHOUSE	115E622
RHR	FCV-74-08	ISI-2074-W-01	10	GATE	PSIV	8	WESTINGHOUSE	1167E79
RHR	FCV-74-09	ISI-2074-W-01	10	GATE	PSIV	8	WESTINGHOUSE	1167E79

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ISI Drawing List

List of Applicable Flow Diagrams

Drawing Series	System Description
47W801	Main & Reheat Steam & Steam Generator Blowdown (TVA Class B)
47W803	Feedwater & Auxiliary Feedwater (TVA Class B & C)
47W809	Chemical & Volume Control (TVA Class A & B)
47W810	Residual Heat Removal (TVA Class A & B)
47W811	Safety Injection (TVA Class A & B)
47W812	Containment Spray (TVA Class B)
47W813	Reactor Coolant (TVA Class A)
47W814	Ice Condenser (exempt)
47W819	Primary Water (exempt)
47W830	Waste Disposal (exempt)
47W832	Raw Water - Yard (TVA Class C)
47W845	Essential Raw Cooling Water (TVA Class B & C)
47W850	Fire Protection & Raw Service Water (TVA Class C)
47W851	Floor & Equipment Drains (exempt)
47W855	Fuel Pool Cleaning & Cooling (TVA Class C)
47W856	Demineralized Water & Cask Decon (exempt)
47W859	Component Cooling (TVA Class B & C)
47W862	Steam Generator Layup Water Treatment (exempt)
47W865	Heating & Air Conditioning (exempt)

ISI Drawings List

Drawing Series	System Description
ISI-0439-C	Piping Support Examination Boundaries (Unit 1 & 2)
ISI-0485-C	Spent Fuel Pool Pumps Support Locations (Unit 1)
ISI-0488-C	ERCW Pumps Support Locations (Unit 1)
ISI-0489-C	ERCW Strainer Support Locations (Unit 1)
ISI-0490-C	ERCW Screen Wash Pumps Support Locations (Unit 1)
ISI-0494-C	Component Cooling Heat Exchanger Support Locations (Unit 1)
ISI-0495-C	Component Cooling Water Pumps Support Locations (Unit 1)
ISI-0496-C	Component Cooling Surge Tank Support Locations (Unit 1)
ISI-0500-C	High Pressure Fire Protection Piping Support Locations (Unit 1)
ISI-0501-C	HPFP Pump Support Locations (Unit 1)
ISI-0502-C	HPFP Strainer Support Locations (Unit 1)
ISI-2001-E	Main steam Relief Valve

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ISI Drawing List

ISI-2001-E	Steam Generators and Supports, Main Steam Safety Valves
ISI-2001-H	Main Steam Piping Support Locations
ISI-2001-W	Main steam Piping Weld Locations
ISI-2003A-H	Feedwater Piping Support Locations
ISI-2003A-W	Feedwater Piping Weld Locations
ISI-2003B-E	Motor Driven Auxiliary Feedwater Pumps Support Locations
ISI-2003B-E	Turbine Driven Auxiliary Feedwater Pump Support Locations
ISI-2003B-H	Auxiliary Feedwater Piping Support Locations
ISI-2003B-W	Auxiliary Feedwater Piping Weld Locations
ISI-2062A-E	Centrifugal Charging Pump Supports
ISI-2062C-E	Seal Water Injection Filter Support Locations
ISI-2062-H	Chemical and Volume Control Piping Support Locations
ISI-2062-W	Chemical and Volume Control Piping Weld Locations
ISI-2063A-E	Boron Injection Tank Weld and Support Locations
ISI-2063B-E	Safety Injection Pump Supports
ISI-2063-H	Safety Injection Piping Support Locations
ISI-2063-W	Safety Injection Piping Weld Locations
ISI-2067-H	Essential Raw Cooling Water Piping Support Locations
ISI-2068A-E	Auxiliary Head Adapters
ISI-2068A-E	Control Rod Drive Housing and CRDM Upper Support
ISI-2068A-E	Reactor Vessel
ISI-2068A-E	Reactor Vessel Closure
ISI-2068A-E	RV Upper head Penetrations
ISI-2068A-E	RV Lower head Penetrations
ISI-2068B-E	Reactor Coolant Pump Casing Weld Locations
ISI-2068B-E	Reactor Coolant Pump Main Flange Bolt Circle
ISI-2068B-E	Reactor Coolant Pump Supports
ISI-2068C-E	Pressurizer, including Nozzle Details and Supports
ISI-2068C-E	Pressurizer Surge Line Piping Supports
ISI-2068C-E	Pressurizer Manway Bolting
ISI-2068-H	Reactor Coolant Piping Support Locations
ISI-2068-W	Reactor Coolant Piping Weld Locations
ISI-2068-MRP	Reactor Coolant Piping MRP Branch Locations
ISI-2070-H	Component Cooling Piping Support Locations
ISI-2072A-E	Containment Spray Pump Support Locations
ISI-2072B-E	Containment Spray Heat Exchanger Support Locations
ISI-2072B-E	Containment Spray Heat Exchanger Weld Locations
ISI-2072-H	Containment Spray Piping Support Locations

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ISI Drawing List

ISI-2072-W	Containment Spray Piping Weld Locations
ISI-2074A-E	Residual Heat Removal Pump Supports
ISI-2074B-E	Residual Heat Removal Heat Exchanger Weld Locations
ISI-2074-H	Residual Heat Removal Piping Support Locations
ISI-2074-W	Residual Heat Removal Piping Weld Locations

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Schedule of Successive Examinations

COMPONENT IDENTIFIER	PROGRAM REFERENCE SECTION	EXAM METHOD	EXAM CAT	CYCLE FLAW INITIALLY DETECTED	FIRST SUCCESSIVE PERIOD	SECOND SUCCESSIVE PERIOD	THIRD SUCCESSIVE PERIOD	ISI DRAWING
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix I
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Notification of Additional Sample Results Form

TO:	Transmittal Number:
FROM:	
Plant/Unit	System
Component ID	
Code Category	Exam Method(s)
Initial Sample	NOI Number
1st Additional Sample	NOI Number
2nd Additional Sample	NOI Number
Drawing Number	Prepared By

Evaluation/Recommendation
(attach additional information if needed)

Additional Components to be Examined

Evaluation/Recommendation Prepared By:

Coordinated with ISI/NDE Representative:

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Requests for Relief

RFR No.	Component RFR Requested	RFR Description	Status
PDI-4	RPV shell-to-flange weld	Use ASME Section XI Appendix VIII for examination of the RPV shell-to-flange weld in lieu of Appendix I.	Submitted for both WBN-1 & -2 by TVA-to-NRC Letter CNL-16-074. See below for text of PDI-4.

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 & 2

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,

REQUEST FOR RELIEF

WBN-1 & -2/PDI-4

TVA requests approval for an alternative to ASME Section XI, paragraph IWA-2232 of the ASME Section XI 2007 Edition through the 2008 Addenda, for the Inservice Examinations at Watts Bar Unit 1 for the Third Ten-Year Inservice Inspection Interval and at Watts Bar Unit 2 for the First Ten-Year Inservice Inspection Interval. Specifically, this relief request is for use of Appendix VIII and Performance Demonstration Initiative (PDI) methodologies for performance of the ultrasonic examination of reactor pressure vessel shell-to-flange welds in lieu of the requirement of Appendix I and the associated Article 4, ASME Section V.

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Requests for Relief

EXECUTIVE SUMMARY:

In accordance with 10 CFR 50.55a(a)(z)(1), TVA is requesting relief from the specific requirements of performing the volumetric examination of the reactor pressure vessel (RPV) circumferential shell-to-flange weld at Watts Bar Units 1 and 2 in accordance with the requirement of Appendix I of Section XI. In lieu of the requirements of Appendix I and its associated sub-requirements of Article 4 of Section V, Watts Bar Units 1 and 2 will use the techniques, personnel, and equipment qualified to meet the requirements of ASME Section XI Appendix VIII, Supplements 4 and 6 of the 2007 Edition through the 2008 Addenda, as administered by the Electric Power Research Institute's (EPRI) Performance Demonstration Initiative (PDI) processes. This proposed alternative represents the best available methodology in qualification of equipment and personnel performing ultrasonic examinations and uses an examination process that has provided and will provide the highest practical quality and greatest amount of coverage for the performance of the shell-to-flange weld examinations. As such, the proposed alternative methodology provides an acceptable level of quality and safety. In addition, the approval of this relief results in savings in the cost of performing the examinations, with not having to incorporate the use of two different sets of examination equipment, and also in future examination will result in lower personnel radiation exposure from not having to use a different methodology for the shell-to-flange weld.

Note that this request for relief is similar to the request granted to Watts Bar Unit 1 during the First and Second 10 Year Intervals submitted most recently in a letter from TVA to the NRC, dated February 7, 2007 and approved by the Staff in a letter dated February 28, 2008 (Ref. ML080630679). Also, this request for relief is similar to the request for Watts Bar Unit 2 for the Preservice Examination which was approved by the NRC in a letter dated September 3, 2009 (Ref. TAC No. ME0022).

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

ASME Code Class 1 Reactor Pressure Vessel (RPV) Upper Vessel Shell-to-Flange Welds, Table IWB-2500-1 Category B-A, Item Number B1.30:

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Requests for Relief

APPLICABLE CODE EDITION AND ADDENDA FOR THE GIVEN EXAM

The applicable ASME section XI Code Edition and Addenda of Record for Watts Bar Units 1 and 2 Inservice Inspection is the 2007 Edition through 2008 Addenda with applicable conditions from 10CFR50.55a.

CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

In accordance with ASME Section XI, paragraph IWA-2232, "Ultrasonic examinations shall be conducted in accordance with Appendix I."

Further, in accordance with Appendix I, paragraph I-2110(b) "Ultrasonic examination of reactor vessel-to-flange welds, closure head-to-flange welds, and integral attachment welds shall be conducted in accordance with Article 4 of Section V, except that alternative examination beam angles may be used."

RELIEF REQUESTED:

Pursuant to 10 CFR 50.55a(a)(z)(1), TVA requests relief from performing the designated vessel shell-to-flange weld examination in accordance with the requirements of ASME Section XI, paragraph IWA-2232, Appendix I, and the associated Article 4 of Section V methodology in accordance with paragraph I-2110(b).

BASIS FOR RELIEF:
In accordance with ASME Section XI, Subarticle IWA-2232, TVA is required to perform ultrasonic examinations (UT) of the RPV upper shell-to-flange welds using Section XI, Appendix I, which in turn requires the use of the NDE methodologies and processes of ASME Section V, Article 4. In addition, the guidance of RG-1.150, Revision 1, was historically applied. The above listed weld is the only circumferential shell weld in the RPV that are not examined in accordance with the requirements of ASME Section XI, Appendix VIII, as mandated in 10 CFR 50.55a. This rule change mandated the use of ASME Section XI, Appendix VIII, Supplements 4 and 6 for the conduct of RPV examinations. It has been recently stated in EPRI PDI coordination meetings between the PDI committee members and the NRC Staff representatives that the NRC Staff expectations are that licensees should submit requests for relief to use the more technically advanced Appendix VIII/PDI processes for the shell-to-flange weld exams, in lieu of the Section XI Appendix I and its associated Section V, Article 4 processes.

PROPOSED ALTERNATIVES:

TVA proposes to use the procedures, personnel, and equipment qualified to meet the requirements of ASME Section XI Appendix VIII, Supplements 4 and 6 as administered by the Electric Power Research Institute's (EPRI) Performance Demonstration Initiative (PDI), to conduct the required vessel-to-flange weld examinations.

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Requests for Relief

JUSTIFICATION FOR GRANTING RELIEF:

ASME Section V, Article 4, describes the required techniques to be used for the UT of welds in ferritic pressure vessels with wall thicknesses greater than 2 inches. The techniques were first published in ASME Section V in the 1974 Edition, Summer 1975 Addenda. The calibration techniques, recording criteria and flaw sizing methods are based upon the use of a distance-amplitude-correction curve (DAC) derived from machined reflectors in a basic calibration block. UT performed in accordance with Section V, Article 4, used recording thresholds of 50 percent DAC for the outer 80 percent of the required examination volume and 20 percent DAC from the clad/base metal interface to the inner 20 percent margin of the examination volume. Indications detected in the designated exam volume portions, with amplitudes below these thresholds, were therefore not required to be recorded. Use of the Appendix VIII/PDI processes would enhance the quality of the examination results reported because the detection sensitivity is more conservative and the procedure requires the examiner to evaluate all indications determined to be flaws regardless of their associated amplitude. The recording thresholds in Section V, Article 4, requirements and in the guidelines of RG-1.150, Revision 1, are generic and somewhat arbitrary and do not take into consideration such factors as flaw orientation, which can influence the amplitude of UT responses.

The EPRI Report NP-6273, “Accuracy of Ultrasonic Flaw Sizing Techniques for Reactor Pressure Vessels,” dated March 1989, established that UT flaw sizing techniques based on tip diffraction are the most accurate. The qualified prescriptive-based UT procedures of ASME Section V, Article 4 have been applied in a controlled process with mockups of RPVs which contained real flaws and the results statistically analyzed according to the screening criteria in Appendix VIII of ASME Section XI. The results show that the procedures in Section V, Article 4, are less effective in detecting flaws than procedures qualified in accordance with Appendix VIII as administered by the PDI processes. Appendix VIII/PDI qualification procedures use the tip diffraction techniques for flaw sizing. The proposed alternative Appendix VIII/PDI UT methodology uses analysis tools based upon echo dynamic motion and tip diffraction criteria which has been validated, and is considered more accurate than the Section V, Article 4 processes.

UT performed in accordance with the Section V, Article 4 processes requires the use of beam angles of 0^{o}, 45^{o}, 60^{o}, and 70^{o} with recording criteria that precipitates equipment changes. Having to perform these process changes is time consuming and results in increased radiation exposure for the examination personnel. Having to comply with the specific ASME Section XI, Appendix I requirements for the RPV circumferential shell-to-flange weld, when the data is obtained using a less technically advanced process, results in an examination that does not provide a compensating increase in quality and safety for the higher costs and personnel exposures involved.

For future RPV shell-to-flange weld examinations, TVA does not anticipate any less coverage than the required minimum of 90 percent of coverage. However, if any such limitations are encountered during the conduct of the examinations, separate individual relief requests will be submitted, as needed.

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Requests for Relief

Procedures, equipment, and personnel qualified through the Appendix VIII, Supplements 4 and 6 PDI programs have shown to have a high probability of detection of flaws and are generally considered superior to the techniques employed earlier for RPV examinations. This approach results in increased reliability of RPV inspections and conditions where an acceptable level of quality and safety is provided with the proposed alternative methodologies. Accordingly, approval of this alternative evaluation process is requested pursuant to 10 CFR 50.55a(z)(1).

IMPLEMENTATION SCHEDULE AND DURATION:

Upon approval by the NRC staff, TVA will implement the provisions of this request for the Inservice Inspection at Watts Bar Unit 1 for the Third Ten-Year Inservice Inspection Interval and at Watts Bar Unit 2 for the First Ten-Year Inservice Inspection Interval. Both Intervals will begin in 2016.

PRECEDENTS

Note that this request for relief is similar to the request granted to Watts Bar Unit 1 during the First and Second 10 Year Intervals submitted most recently in a letter from TVA to the NRC, dated February 7, 2007 and approved by the NRC Staff in a letter dated February 28, 2008 (Ref. ML080630679).

This request for relief is similar to the request granted to Watts Bar Unit 2 during the Preservice Examination in an NRC letter dated September 3, 2009 (TAC NO. ME0022).

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Augmented Examinations

The following augmented examinations have been requested to be included in the ISI Program by the responsible organization listed. A summary of the augmented examinations are listed below and a detailed description follows this page.

NOTE

When augmented examinations of welds do not interrogate greater than 90% of the examination volume, the basis and/or requirements for performing the exam shall be reviewed to determine if the limited exam requires a UFSAR change, 50.59 screening review, or request for relief to ensure acceptability.

1.0 REACTOR COOLANT PUMP FLYWHEEL

Examination Requirements and Schedule:

A. Perform an in-place ultrasonic examination of the areas of higher stress concentration at the bore and keyway at approximately 3-year intervals during the refueling or maintenance outages.

B. Perform a surface examination of all exposed surfaces and complete ultrasonic examination at approximately 10-year intervals during the plant shutdown coinciding with the ISI schedule as required by Section XI.

Responsible Organization: Component Engineering

The augmented examination requirements of the reactor coolant pump flywheel are included in Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1; (1) an in-place ultrasonic examination of the areas of higher stress concentration at the bore and keyway at approximately 3-year intervals during the refueling or maintenance shutdown coinciding with the ISI schedule as required by Section XI of the ASME Code, and (2) a surface examination of all exposed surfaces (exposed areas are considered as those areas accessible for examination without having to remove the flywheel from the housing) and complete ultrasonic examination at approximately 10-year intervals during the plant shutdown coinciding with the ISI schedule as required by Section XI of the ASME Code. This examination is performed in accordance with WBN Technical Surveillance Requirement 3.4.5.1.

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Augmented Examinations

This augmented examination does not require a special report unless the examination reveals a flaw. The acceptance criteria should conform to the recommendations of Regulatory Position C.2.F in Regulatory Guide 1.14. If the examination and evaluation indicate an increase in flaw size or growth rate greater than predicted for the service life of the flywheel, the results of the examination and evaluation should be submitted to the NRC for evaluation. Refer to Regulatory Guide 1.14 for information to be included. The examination results shall be included in the augmented section of the ISI Summary Report.

The flywheel consists of 2 plates, approximately 7-inches thick each, bolted together. Each plate is fabricated from vacuum degassed A-533, GR. B, Class 1, steel.

The 3-year in place RCP examinations shall be recorded using the RCP motor serial number and exam ID:

RCP Motor S/N - BOREKEY (i.e., 4S-82P192 - BOREKEY)

For the 10-year exam, the IDs shall be:

RCP Motor S/N - SUR (i.e., 4S-82P192 - SUR)

RCP Motor S/N - VOL (i.e., 4S-82P192 - VOL)

Reactor Coolant Pump Flywheel Augmented Inspection Schedule

		3 Years		6 Years		9 Years
	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6
RCP Motor Flywheels						
Flywheel 2-1		UT		UT		UT & MT
Flywheel 2-2		UT		UT		UT & MT
Flywheel 2-3		UT		UT		UT & MT
Flywheel 2-4		UT		UT		UT & MT

2.0 THIS SECTION INTENTIONALLY LEFT BLANK.

3.0 EXAMINATION OF PIPING WELDS WITH MULTIPLE WELD REPAIRS

Examination Requirement and Schedule: perform ultrasonic examination of welds with multiple weld repairs as scheduled each refueling outage.

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Augmented Examinations

1.0 REACTOR COOLANT PUMP FLYWHEEL (continued)

Responsible Organization: Mechanical/Nuclear Engineering

During the 7th refueling outage Inservice Inspection (ISI) of Sequoyah Nuclear Plant Unit 2, an Intergranular Stress Corrosion Crack (IGSCC) exceeding the acceptance standards of ASME Section XI was discovered in a safety injection system weld. Problem evaluation report (PER) SQ961154 was written and the cause of the indication was attributed to multiple weld repairs performed over the life of the weld. As part of the corrective active, WBN reviewed the weld monitoring program for welds with 4 or more weld repairs. These welds are listed in the table below and are to be examined under this augmented requirement. For Watts Bar Unit 2, with no operating history, this table is blank but is being maintained for future utilization.

Each of these welds will be ultrasonically examined and evaluated per NDE procedure N-UT-64 using IGSCC techniques during the first refueling outage and during following outages at the frequency provided in the table below. The results are to be submitted to the Materials Section for evaluation. Materials will evaluate results and make additional recommendations as required. The examination results will be included in the augmented section of the Site Final Report.

				Examine Weld in Refueling Outage						
									10-year	
ISI Weld Number	ISI Drawing Number	Pipe Dia.	Wall Thick.	1	2	3	4	5	6	7

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS

Examination Requirement and Schedule:

A. RPV Top Head

In response to leaks and nozzle cracking in PWR plants, the NRC issued an Order EA 03-009 on February 11, 2003 entitled, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors." The NRC Order has since been superseded by ASME Code Case N-729-1 as conditioned by 10CFR 50.55a. The visual, surface, and volumetric examinations and examination frequencies are ASME Code requirements, in accordance with 10CFR 50.55a, and will be performed in accordance with Code Case N-729-1. WBN Unit 2 performed the Preservice Inspection (PSI) per EA 03-009, and full coverage of the examination volumes and surface areas per N-729-1 was obtained. The Inservice Inspections will be performed to ASME Code Case N-729-1 as conditioned by 10CFR 50. Reference Exam Category B-P and the Alloy 600 Table.

B. RPV Bottom Head

Visual examination of the reactor pressure vessel bottom-mounted instrument penetrations are performed in accordance with Code Case N-722-1. The visual examinations and examination frequencies are ASME Code requirements, in accordance with 10CFR 50.55a. Reference Exam Category B-P and the Alloy 600 Table.

C. Pressurizer

The pressurizer spray, safety, relief and surge nozzles were mitigated, using a mechanical stress improvement (MSIP) process, before plant commercial operation. Inspections are required, post-mitigation, in accordance with ASME Code Case N-770-1 which defines these welds as Inspection Item D, uncracked butt weld mitigated with stress improvements. These welds have no known cracks based on examination by personnel using procedures in conformance with qualified UT techniques that meet the requirements of Section -2500 of Code Case N-770-1, and have been treated with an acceptable stress improvement process (MSIP).

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Augmented Examinations

Examine all welds in the first 10 years following stress improvement application, i.e., during the First 10-Year Interval. Examine all welds no sooner than the third refueling outage and no later than 10 years following MSIP, i.e., between Refueling Outage 3 and 6 inclusive. See Note 5 of the Alloy 600 Table.

(In future 10-Year Intervals, examination volumes that show no indication of cracking shall be placed into a population to be examined on a sample basis. Twenty-five percent of this population shall be added to the ISI Program in accordance with -2410 and shall be examined once each 10-year inspection interval.)

Reference Exam Category B-P and the Alloy 600 Table.

D. RPV Nozzle-to-safe end welds

1. RV Hot Legs

ASME Code Case N-770-1 defines Inspection Item D as Uncracked butt welds mitigated with stress improvement (MSIP). These locations have been examined by personnel using procedures in conformance with qualified UT techniques and techniques that meet the requirements of Section-2500 of N-770-1.

Per 10CFR50, all Inspection Item D welds shall be volumetrically inspected no sooner than the third refueling outage and no later than 10 years following MSIP.

Reference the Alloy 600 Table.

2. RV Cold Legs

ASME Code Case N-770-1 defines Inspection Item D as Uncracked butt welds mitigated with stress improvement (MSIP). These locations have been examined by personnel using procedures in conformance with qualified UT techniques and techniques that meet the requirements of Section-2500 of N-770-1.

Per 10CFR50, all Inspection Item D welds shall be volumetrically inspected no sooner than the third refueling outage and no later than 10 years following MSIP.

Reference the Alloy 600 Table.

E. RPV Upper Head Injection (Capped) Safe End Welds

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

ASME Code Case N-770-1 defines Inspection Item B as Unmitigated butt welds at Cold Leg operating temperature (-2410) > or = 525 degrees F and < or equal to 580 degrees F. The 8 UPIAH welds have an operating temperature of 557 degrees F. These locations have been examined by personnel using procedures in conformance with qualified UT techniques and techniques that meet the requirements of Section-2500 of N-770-1.

Reference the Alloy 600 Table.

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

NOTES for ALLOY 600 TABLE

1) Per Enclosure 1 of WBN U2, Supplemental Information Regarding Certain NRC Generic Letters and Bulletins, dated April 1, 2010, ML 100950044, WBN U2 will perform Enhance Visual (VE) inspections of RPV Upper Head penetrations (79 partial penetration welds on the underside of the RPV Head) during the first refueling outage in accordance with 10CFR50.55a(g)(6)(ii)(D)(2) through (6) and ASME Code Case N-729-1.

2) Per Attachment 5 of WBN U2, Initial Response to Bulletins and Generic Letters, dated September 7, 2007, ML 072570676, WBN U2 will perform an Enhanced Visual (VE) examination of the RPV Lower Head penetrations during the first refueling outage per ASME Code Case N-722-1.

3) Per:
Attachment 6 of WBN U2, Initial Response to Bulletins and Generic Letters, dated September 7, 2007, ML 072570676,
Enclosure 1 of WBN U2, Supplemental Response to NRC Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized Water Reactors," dated September 29, 2008, ML 082750518, and
Enclosure 5 of WBN U2, Supplemental Information Regarding Certain NRC Generic Letters and Bulletins, dated April 1, 2010, ML 100950044,
WBN U2 will perform bare metal visual (BMV) inspection of the upper pressurizer Alloy 600 locations at the first refueling outage.

   If any evidence of apparent reactor coolant pressure boundary leakage is discovered during the BMV examination, then NDE capable of determining crack orientation will be performed in order to accurately characterize the flaw, the orientation, and extent. TVA will develop plans to perform an adequate extent of condition evaluation, and plans to possible expand the scope of NDE to other components in the pressurizer, which will be discussed with NRC technical staff prior to restarting Unit 2. TVA will provide the required response for inspections performed within 60 days after completion of the first refueling outage.

4) Subsequent Inservice Inspection of Unmitigated Welds (8 UPIAH butt welds) With Inside Surface Connected Planar Flaws

   - (a) If planar surface flaws are detected in the butt weld/base metal inside surface, this weld shall be reexamined at the shorter frequency of every refueling outage or the frequency determined by the crack growth analysis of N-770-1, -3132.3.
   - (b) This weld shall be subsequently examined at the frequency required by (a) unless mitigated.

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

NOTES for ALLOY 600 TABLE

5) The 4 RPV Hot Leg Nozzle-to-Safe-End welds, the 4 RPV Cold Leg Nozzle-to-Safe-End welds, and the 6 Pressurizer Nozzle-to-Safe-End welds are classified as ASME Code Case N-770-1 Inspection Item D, “Uncracked butt welds mitigated with Stress Improvement (SI)”. The inspection frequency requirement for these welds is that all welds are to be inspected no sooner than the third refueling outage and no later than 10 years following MSIP, which was accomplished before commercial operation. (In future 10-Year Intervals, this number of weld inspections may be reduced to a 25% sampling program of uncracked welds which will be examined once each 10-Year Inspection Interval).

6) The 4 Upper Head Injection capped penetration (5” NPS, Sch 160) butt welds (UPIAH-4A-D) are susceptible to PWSCC and are unmitigated. The pipe base material on the RPV Head side and the weld are Alloy 600. The pipe above the weld is 304 stainless steel, so these 4 welds are Dissimilar Metal (DM) welds. They are also classified as ASME Code Case N-770-1 Inspection Item B, “Unmitigated butt weld at Cold Leg operating temperature (-2410) > or = 525 degrees F and < or = 580 degrees F". The RPV Upper Head has an operating temperature of 557 degrees F.

   The 4 AHA butt welds (UPIAH-2/3A-D), just above the RPV Head, are susceptible to PWSCC and are unmitigated. They are Dissimilar Metal (DM) welds consisting of carbon steel weld material build up, alloy 600 buttering, and an alloy 600 weld to an alloy 600 pipe (5” NPS, Sch 160). The entire weld volume is unmitigated. These 4 welds are also classified as Inspection Item B per N-770-1.

   The Enhanced Visual (VE) is to be performed on these 8 unmitigated welds once per interval.
   The volumetric (UT) examination is to be performed on these 8 unmitigated welds every second inspection period not to exceed 7 years.

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

ALLOY 600 TABLE
Alloy-600 weld examination schedule
(includes ASME Code and Augmented Examinations)

	1.5 Years 1st Period	3 Years 1st Period	4.5 Years 2nd Period	6 Years 2nd Period	7.5 Years 3rd Period	9 Years 3rd Period End of Interval	10.5 Years	12 Years
Refueling Outage	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
RPV Upper Head								
Bare Metal Visual	VE **Note 1**	VT-2	VT-2	VE	VT-2	VT-2	VE	VT-2
Volumetric and/or Surface				UT				
RPV Lower Head	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
Bare Metal Visual	VE **Note 2**		VE		VE		VE	
Pressurizer (Note 5)	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
WP-10-SE	VE **Note 3**		UT & PT				VE	UT & PT
WP-11-SE	VE **Note 3**		UT & PT				VE	UT & PT
WP-12-SE	VE **Note 3**		VE	UT & PT				VE
WP-13-SE	VE **Note 3**		VE	UT & PT				VE

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

WP-14-SE	VE **Note 3**				VE	UT & PT		
WP-15-SE	VE **Note 3**				VE	UT & PT		
RPV Cold Leg Nozzles (Note 5)	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
N11-SE						UT & ET/PT		
N12-SE						UT & ET/PT		
N13-SE						UT & ET/PT		
N14-SE						UT & ET/PT		
RPV Hot Leg Nozzles (Note 5)	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
N15-SE			UT & ET/PT					
N16-SE			UT & ET/PT					
N17-SE						UT & ET/PT		
N18-SE						UT & ET/PT		
RPV Upper Head Injection (Capped) (Notes 4 & 6)	RFO1	RFO2	RFO3	RFO4	RFO5	RFO6	RFO7	RFO8
UPIAH-4A **(Notes 4 & 6)**				UT & PT		VE		UT & PT

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

UPIAH-4B **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-4C **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-4D **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-2/3A **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-2/3B **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-2/3C **(Notes 4 & 6)**				UT & PT		VE		UT & PT
UPIAH-2/3D **(Notes 4 & 6)**				UT & PT		VE		UT & PT

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Augmented Examinations

4.0 EXAMINATION OF ALLOY 600 WELDS (continued)

5.0 Materials Reliability Program Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines (MRP-146)

Four examination locations were selected for MRP-146 which requires inspections of small-bore piping areas on branches of reactor coolant system piping. At Watts Bar Unit 2, four such locations exist. These are areas, not welds, but may include welds in the areas.

A. Three are crossover drains. Reference drawing ISI-2068-MRP-02.

MRP-146-DR-1 (Loop 1).

MRP-146-DR-2 (Loop 2).

MRP-146-DR-4 (Loop 4).

In the Risk-Informed ISI application, these areas/welds were not selected for examination.

The Crossover Drains have an inspection frequency of every other outage. Reference MRP-146 Revision 1.

B. One is a boron injection line on the Cold Leg Loop 1. Reference drawing ISI-2068-MRP-01.

MRP-146-CL-1 (Loop 1)

In the Risk-Informed ISI application, this area/weld was not selected for examination.

The Boron Injection Line has an inspection frequency of every outage. Reference MRP-146 Revision 1.

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Augmented Examinations

6.0 Steam Generator Lateral Support Examination (WAT-D-12064)

Westinghouse has recommended inspecting the SG upper lateral support splice bolts each outage via WAT-D-12064.

Description	Exam Method	Number of Components	% To be examined	Number to be Examined	Inspection Frequency	ISI Drawing
Class 2 Steam Generator Lateral Support Code Category F-A Code Item No F1.42B	VT-3	4 SGs / 1 support each	100%	4 SG supports	Every Outage	ISI-2001-E-03

Source Notes
(Page 1 of 1)

Source Note	Source Document	Summary
None	None	None

ENCLOSURE 2

Watts Bar Nuclear Plant Unit 2
Surveillance Instruction 2-SI-68-907
Steam Generator Tubing Inservice Inspection and Augmented Inspections
Revision 1

Watts Bar Nuclear Plant

Unit 2

Surveillance Instruction

2-SI-68-907

Steam Generator Tubing Inservice Inspection and Augmented Inspections

Revision 0001

Quality Related

Level of Use: Reference Use

Effective Date: 11-23-2015

Responsible Organization: SCE, System Eng - Component

Prepared By: Emmett Camp

Approved By: Keith Dietrich

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	10/01/2014	ALL	Initial Issue - Unit 2 SI developed from Unit 1 (SI-68-907, Rev 0019) and updated to Word 2007. Reviewed/updated to be consistent with Unit-1. Ready for IIQR. Included Numerous changes driven by Revision 2 of the EPRI Steam Generator Tube Integrity Assessment Guidelines and Self Assessment CRP-ENG-06-017.
0001	11-23-15	43, 95	Revised App C, 2.0, to include a requirement to perform visual inspections each outage of blowdown piping internal to the original SGs. Revised Source Notes to include reference to T02071217001 as the document driving inspections to detect and/or monitor blowdown piping cracking.

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Purpose

This Instruction provides details and defines the requirements for performing the first 10-year interval inservice inspections (ISIs) of steam generator (SG) tubing for WBN Unit 2.[C.1] The requirements of this Instruction are applicable beginning at the start date of the first 10-year interval of WBN Unit 2. SG tubing examinations are predominantly performed by contractors.

TVA's Steam Generator Program procedures are divided into four different kinds of procedures. NEDP-16 is the upper tier document for the SG program and implements the requirements of NEI-97-06 and contains management directives. Site Surveillance Instructions primarily implements site Technical Specification Surveillance Requirements. Because site Technical Specifications contain requirements for the selection of tubes to be NDE examined and the frequency of examinations and the examination extent and determines SG "operability," the site Surveillance Instructions are augmented with additional similar requirements from other sources (such as requirements from EPRI SG Examination Guidelines, EPRI Tube Integrity Assessment Guidelines, and EPRI In-Situ Pressure Test Guidelines).

Site Maintenance Instructions are utilized to implement and document maintenance activities (such as Repair and Replacement activities) and therefore additional similar activities are also included in the MIs. The site Surveillance Instructions and Maintenance Instructions are only worked during outages and therefore a SG action item data base has been created to implement actions which do **NOT** occur during outages.

1.2 Scope and Background

1.2.1 Scope

A. NDE techniques and qualification of personnel will be in accordance with the 2001 Edition, 2003 Addenda of ASME Section XI. Otherwise, this Instruction fulfills the requirements of the 2001 Edition, 2003 Addendum of the ASME Section XI Boiler and Pressure Vessel Code[C.20] and exceeds requirements of WBN Technical Specification 5.7.2.12, and fulfills applicable requirements of NEI-97-06[C.20], EPRI PWR Steam Generator Examination Guidelines,[C.2] EPRI SG Integrity Guidelines [C.17], and EPRI SG In-Situ Pressure Test Guidelines. [C.18]

B. Additional augmented inspections administered by the SG Program on structures of the SG are performed as directed by this Instruction.

1.2.2 Surveillance Requirements Fulfilled and Modes

Performance of this Instruction partially satisfies the following Technical Specifications:

Surveillance Requirement	Applicable Modes	Performance Modes
3.4.17.1	1,2,3,4	5,6, No Mode
3.4.17.2	1,2,3,4	5,6, No Mode

1.2.3 Background

Each SG tube bundle consists of 4,674 low temperature mill-annealed NiCrFe alloy 600 (Inconel SB-163) inverted U-tubes of 0.75 inch O.D. by 0.043 inch average wall thickness. During the inspection, SG tubing shall undergo eddy current examinations in accordance with the EPRI PWR Steam Generator Examination Guidelines. Other NDE methods may be utilized to improve the characterization of an indication.

1.3 Frequency and Conditions

A. This Instruction is performed typically every 18 months during a refueling outage.

B. The first ISI interval is defined by 2-TRI-0-10.1.

C. The Unit 2 Technical Specifications requires that periodic SG tube inspections be performed as follows.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation. [C.22]

2. After the first refueling outage following SG installation, inspect each steam generator at least every 24 effective full power months or at least every refueling outage (whichever results in more frequent inspections). [C.22]

3. Inspect 100% of the tubes at sequential periods of 60 effective full power months beginning after the first refueling outage inspection following SG installation. [C.22]

4. The 60 effective full power months inspection period may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage. [C.22]

1.3 Frequency and Conditions (continued)

5. If degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube repair criteria, the minimum number of locations inspected with such capable inspection technique during the remainder of the inspection period may be prorated. The fraction of location to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. [C.22]

6. If crack indication are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever results in more frequent inspections). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack. [C.22]

7. The inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection.

D. A Pre-Service Inspection shall be performed prior to initial power operation to provide a definitive baseline record against which in-service changes can be compared. [C.2]

E. Additional unscheduled ISI's shall be performed on each SG during the shutdown subsequent to any of the following conditions, [C.2]

1. Primary-to-secondary tube leaks (**NOT** including leaks originating from tube-to-tube sheet welds) leading to a plant shutdown. [C.2]

2. A seismic occurrence greater than the Operating Basis Earthquake, [C.2]

3. A loss-of-coolant accident requiring actuation of the Engineered Safety Features, [C.2]

4. A main steam line or feedwater line break. [C.2]

F. If an unscheduled ISI is performed for other than above reasons, an engineering evaluation shall determine which SG will be examined based on the failure mechanism.

2.0 REFERENCES

2.1 Performance References

A. 2-MI-68.008, Steam Generator Primary Side Maintenance Activities.

B. 2-TRI-0-10.1, ASME Section XI ISI/NDE Program.

C. 2-MI-3.015, Steam Generator Secondary Side Maintenance Activities.

D. EPRI Steam Generator Integrity Assessment Guidelines

E. EPRI Steam Generator In Situ Pressure Test Guidelines

F. EPRI PWR Steam Generator Examination Guidelines

G. NEI 97-06, Steam Generator Program Guidelines

H. EPRI Steam Generator Degradation Specific Management Flaw Handbook

I. EDMS #B85120511001, EPRI Errata 4-10-2012, Ligament Pop-Through Models

2.2 Developmental References

2.2.1 TVA Procedures

A. NEDP-16, Steam Generator Program.

B. NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10CFR50.65

C. NPG-SPP-01.2, Administration of Site Technical Procedures

2.2.2 Other

A. Unit 2 Technical Specifications 3.4.17, 5.7.2.11, 5.7.2.12, and 5.9.9.

B. Final Safety Analysis Report Section 5.5.2.

C. Regulatory Guide 1.83.

D. ASME Code, Section XI, 2001 Edition, 2003 Addenda.

E. Draft Regulatory Guide 1.121

F. WB-DC-40-70 Section 4.3.1

G. Technical Specification Task Force Traveler TSTF-510, Rev. 2, “Revision to Steam Generator Program Inspection Frequencies and Sample Selection”

3.0 PRECAUTIONS AND LIMITATIONS

A. Contractor personnel certifications shall be reviewed and acceptance documented by an ISO ET Level III.

B. Contractor procedures shall be reviewed and acceptance documented in accordance with NPG-SPP-1.2.

C. Contractor NDE equipment certifications shall be reviewed and acceptance documented.

D. Verify the Eddy Current procedure is demonstrated to the satisfaction of the ANII.

E. Optimize Eddy Current test methods to minimize electrical noise and signal interference and maximize flaw sensitivity. [C.9]

F. During Eddy Current testing, anticipate potential sources of interfering signals, i.e., probe liftoff caused by tube transition geometry and dents, understanding potential effect on flaw detection. [C.9]

G. Review the work scope with the Eddy Current contractor, and inform the contractor that any change to scope must be approved by the TVA Eddy Current Level III and the SG Engineer.

H. Verify Eddy Current analysts designated to resolve primary/secondary analysis discrepancies are qualified data analysts per the EPRI PWR Steam Generator Examination Guidelines.[C.11]

I. Ensure contractor can provide an Eddy Current primary/secondary analysis discrepancy report once per shift. [C.11]

J. Verify the Eddy current Data Control Flowchart of Appendix B has been reviewed with the contractor. [C.11]

K. Review TVAN outage specific Degradation Assessment with the vendor's data management and lead analyst personnel.

L. Perform query on vendor's database to ensure all relevant 3-letter codes will be reported to TVA personnel during inspection.

M. Ensure the pressure and temperature conditions used in the determination of the accident induced leakage rate are consistent with the conditions assumed in the accident analysis.

Date _____

3.0 PRECAUTIONS AND LIMITATIONS (continued)

N. Ensure contractor calibration standards fulfill the requirements of ASME Section XI and industry guidelines.

O. Ensure contractor personnel performing tube integrity calculations have a copy of EPRI Errata 4-10-2012 EDMS B85120511001 to prior to performing calculations.

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

[1] **PREPARE** a Degradation Assessment prior to each inspection in accordance with EPRI Steam Generator Integrity Assessment Guidelines [C.17], [C.20] and the Minimum Requirements in Appendix J, **AND**

ENSURE that is has been reviewed by the TVA Eddy Current Level III and approved by the SG Program Specialist and appropriate Management. _____

[2] **ENSURE** the Degradation Assessment is distributed to:

A. SG Eddy Current Contractor, _____

B. ANI/ANII

C. EDMS _____

NOTES

1) During an inspection it may become necessary to expeditiously change the Degradation Assessment. As a minimum, the expeditious change shall receive the same approval (i.e., distribution may be performed later).
2) If a degradation mechanism is identified that was **NOT** sufficiently addressed in the Degradation Assessment, a PER shall be initiated.

[3] **IF**, during the inspection, it becomes necessary to change the Degradation Assessment, **THEN**

PERFORM above steps 4.1[1] and 4.1[2] for each change. _____

Date _____

4.1 Preliminary Actions (continued)

[4] **PREPARE** the Scan Plan for SG tubing examination [C20], prior to inspection, in accordance with the requirements in Sections 1.3 and 6.1 and the EPRI PWR Steam Generator Examination Guidelines, and the Degradation Assessment, **AND**

ENSURE the Scan Plan contains:

A. Examination extent,

B. Examination technique (probe type)**.** _____

[5] **ENSURE** the Scan Plan has been approved by the ISO ET Level III, SG Program Specialist, and appropriate Engineering Manager, **AND**

ENSURE the Scan Plan is distributed to:

A. SG Eddy Current Contractor

B. ANI/ANII

C. EDMS _____

NOTE

During the implementation of the Scan Plan it may become necessary to expeditiously revise the inspection scope of the Scan Plan. As a minimum, the revised inspection scope shall receive the same review and approval prior to implementation (i.e., distribution to other than the contractor may be performed later).

[6] **IF**, during the inspection, it becomes necessary to change the Scan Plan, **THEN**

PERFORM above steps 4.1[4] and 4.1[5] for each change. _____

Date _____

4.1 Preliminary Actions (continued)

[7] **PREPARE** the site eddy current analysis guidelines,[C.20] **AND**

ENSURE it has been approved by the SG Program Specialist, **AND**

ENSURE it has been distributed to:

A. SG Eddy Current Contractor

B. EDMS _____

[8] **ENSURE** prerequisite actions of 2-MI-68.008 have been implemented. _____

[9] **RECORD** start date and time on Surveillance Task Sheet. _____

[10] **INDICATE** the type(s) of performance below:

A. Scheduled ISI. ☐

B. Unscheduled ISI. ☐

C. Augmented ISI (Appendix D). ☐

D. Pre-Service Inspection ☐

NOTE

Step 4.1[11] may be N/A'd if no deviations are identified.

[11] **IF** any deviation to the following industry documents are identified

- EPRI PWR Steam Generator Examination Guidelines
- EPRI Steam Generator Integrity Assessment Guidelines
- EPRI Steam Generator In-Situ Pressure Testing Guidelines

THEN

A. **ENSURE** a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, **AND** _____

Date _____

4.1 Preliminary Actions (continued)

B. **ENSURE** knowledgeable second party (not necessarily independent of the review and approval) is obtained prior to implementing the deviation, **AND** _____

C. **ENSURE** that Site Vice President concurrence is obtained for the above **AND** _____

D. **ENSURE** the written deviation and second opinion is promptly forwarded (within 45 days of VP concurrence) to NEI and EPRI SGMP for posting to their respective websites and _____

E. **ENSURE** that a PER is written on the deviations. _____

F. **ENSURE** management concurrence is EDMS retrievable. _____

[12] **NOTIFY** NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: _____

- The guidance being deviated from
- Justification for the deviation, and
- Any actions undertaken in liev of the guidance

4.2 Approvals and Notifications

[1] **OBTAIN** Shift Manager / Designee (SM/D) approval to perform this instruction on Surveillance Task Sheet. _____

5.0 ACCEPTANCE CRITERIA

A. The frequency of SG tube examinations, the minimum sample size, inspection result classification, and the corresponding actions required shall fulfill the requirements of the EPRI PWR Steam Generator Examination Guidelines (refer to Appendix F definitions).

B. The SG shall be determined operable after plugging or repairing all tubes exceeding the plugging limit and successfully achieving Condition Monitoring (refer to Appendix F definitions).

C. The total equivalent number of tubes plugged per SG is less than or equal to 10% (467 tubes).

D. The SG Maintenance Rule performance criteria is < 1 Condition Monitoring Failure (CMF) where a CMF is **NOT** maintaining tube structural integrity as defined by Draft Regulatory Guide 1.121 or NEI-97-06 at the end of the fuel cycle as determined by:

1. Tube pull analysis,

2. In situ pressure testing,

3. Analytical analysis,

4. Probabilistic analysis, or

5. Other means.

E. All in-service steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cooldown), all anticipated transients included in the design specification, and design basis accidents. [C.22]

F. Structural integrity is defined as retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differentials and a safety factor of 1.4 against burst applied to the design basis accident primary -to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads. [C.22]

5.0 ACCEPTANCE CRITERIA (continued)

G. The primary-to-secondary accident induced leakage rate for any design basis accident, other than a steam generator tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all steam generators and leakage rate for an individual steam generator. Leakage is not to exceed 1 gpm per SG, except for specific types of degradation at specific locations as described in parargraph 6.1.C. [C.22]

H. The potential primary-to-secondary leak rate during postulated design basis accidents shall not exceed the offsite radiological dose consequences required by 10CFR100 guidelines or the radiological consequences to control room personnel required by GDC-19, or other NRC-approved licensing basis. [C.21]

I. For circumferential indications detected in the U-bend region in larger radius U-bends degraded on the extrados or intrados, the structural limit is 25 Percent Degraded Area unless a Westinghouse evaluation is performed justifying exceeding 25 Percent Degraded Area.

6.0 PERFORMANCE

6.1 General Requirements

The Unit 2 Technical Specifications requires a Steam Generator (SG) Program be established and implemented to ensure that SG tube integrity is maintained. In addition, the SG Program shall include the following provisions: [C.22]

A. Provision for condition monitoring assessments. [C.22]

1. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. [C.22]

2. The "as found" condition refers to the condition of tubing during a SG inspection outage, as determined from the inservice inspection results or by other mean, prior to the plugging of tubes. [C.22]

3. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected and/or plugged, to confirm that the performance criteria are being met. [C.22]

B. Performance criteria for SG tube integrity. [C.22]

1. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity sections 5.0E, 5.0F and 5.0G, accident induced leakage section 5.0G and 5.0H and operational leakage [refer to LCO 3.4.6.2, "Reactor Coolant System, Operational Leakage"] [C.22]

C. Provisions for SG tube plugging [or repair]. [C.22]

1. Tubes found by inservice inspection to contain flaws [degradation] with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged. [C.22]

2. For the purpose of [WBN Unit 2 Technical] Specification, tube plugging is not a repair. [C.22]

D. Provisions for SG tube inspections. [C.22]

1. Periodic SG tube inspections shall be performed [in accordance with frequencies defined in section 1.3]. [C.22]

6.1 General Requirements (continued)

a. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging or repair criteria. [C.22]

b. The tube-to-tubesheet weld is **not** part of the tube. [C.22]

c. The inspection scope, inspection methods, and inspection intervals [frequencies] shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. [C.22]

d. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and , based on this assessment, to determine which inspection methods need to be employed and at what locations. [C.22]

E. The SG inspection will fulfill the requirements of the EPRI PWR Steam Generator Examination Guidelines (latest revision) and minimum requirements in appendices J, K, L, M and N. For a minimum inspection sample to be acceptable per the EPRI PWR Steam Generator Examination Guidelines, tube inspections shall include 20% minimum of active (in-service) tubes selected on a random basis evenly distributed among the SG with an evenly spaced grid across the tube bundle, except: [C.4, C.2]

1. Where experience in similar plants with similar water chemistry indicates critical areas to be inspected, follow the recommendations for critical areas in the EPRI PWR Steam Generator Examination Guidelines and Minimum Requirements in Appendix J. [C.10]

2. When an active degradation mechanism is present, an inspection sample shall be defined and examined in accordance with the Degradation Assessment. [C.2]

F. The first sample of tubes selected for each minimum ISI (subsequent to the preservice inspection) of each SG shall include:

1. All non-repaired tubes that have prior indication of degradation shall be examined through the zone of degradation when the applicable SGs are opened for examination. [C.2]

2. Tubes in those areas where experience has indicated potential problems. [C.10]

6.1 General Requirements (continued)

3. If AVB wear is a non-active degradation mechanism, then examine 20% of the tubes in the region where AVB wear may potentially occur with bobbin coil (or equivalent) probe. [C.4] If AVB wear is an active degradation mechanism then examine 100% of the tubes in the region where AVB wear may potentially occur with bobbin coil (or equivalent) probe. [C.2]

4. All leaking tubes and adjacent bounding tubes

5. SG tubes adjacent to loose parts which could **NOT** be retrieved, as indicated by FOSAR per MI-3.015, with bobbin coil (or equivalent) probe for detection of loose part wear. [C.8]

6. All peripheral tubes, including tubes adjacent to non-tube lane regions, shall be examined (with bobbin coil or equivalent probe) for the detection of loose parts wear. [C.2]

7. Tubes (full length) and/or tubes regions identified in the Degradation Assessment shall be examined by the NDE technique specified in the Degradation Assessment.

8. The need to examine the cold leg region for temperature sensitive degradation mechanisms shall be based on the results of the Degradation Assessment. [C.2]

G. The tubes selected as an expansion sample (if required by the EPRI PWR Steam Generator Examination Guidelines with Minimum Requirements of Appendix J) during each ISI may be subjected to partial tube inspection provided:

1. The tubes selected for these samples include the tubes from those areas of the tube sheet array where tubes with imperfections were previously found, and

2. The inspections include those portions of the tubes where imperfections were previously found.

6.1 General Requirements (continued)

H. Pre-Service Inspection Requirements

1. The PSI of SGs shall be conducted with the bobbin coil on all tubing full length. [C.2]

2. A representative sample of abnormal conditions (for example, over / under expansion transitions, manufacturing burnish marks, unusual signals, dings, cold laps) observed during the baseline examination shall be examined with other techniques (for example, rotating coil technology array probes, or ultrasonic probes) to provide a basis for signal characterization and future historical comparisons. [C.2]

3. A PSI of tube sleeves (over the entire length of the sleeve) shall be performed prior to the SGs being returned to service. The PSI of tube sleeves, shall also include a utility review, in addition to vendor review, of the installation process parameters for each installed sleeve to ensure that the sleeve installation process was performed as intended. [C.2]

I. Technique Requirements

The examination technique used for the periodic sample shall meet the system performance requirements described in the EPRI PWR SG Examination Guidelines. [C.2]

NOTE

The following does not apply during SG replacement outages.

J. Requirements when primary-to-secondary operational leakage ≥ 5 GPD

1. Monitor all SGs and Determine which SG(s) are leaking.

2. If the primary-to-secondary Operational Leakage is ≥ 5 GPD in any one SG, then a hydrostatic test, bubble test, or helium leak test shall be performed to identify the suspect tubes. [C.21]

3. Examine the leaking tube by eddy current to determine the axial location of the leak, the extent, orientation, and degradation mechanism morphology.

4. Review prior inspection information on the leaking tube(s) and determine if INSITU leak testing is required per EPRI guideline.

5. Determine the cause (required per EPRI guidance) of the leak and execute corrective actions (in accordance with NPG-SPP-22.300).

6.1 General Requirements (continued)

6. Update the Degradation Assessment, Condition Monitoring, and Operational Assessment Reports (as necessary) to address unexpected leakage.

7. Ensure the leaking tube is plugged.

Date _____

6.2 Inspection

[1] **ENSURE** precautions and limitations in Section 3.0 have been reviewed. _____

[2] **ENSURE** prerequisite actions in Section 4.0 have been met. _____

[3] **PERFORM** a tube inspection on each selected tube per the approved Scan Plan and Scope Expansion Plans. _____

[4] **IF** Step 4.1[10]C was checked, **THEN**

PERFORM the appropriate augmented inspection of the SG in accordance with Appendix C, **AND**

DOCUMENT the results and any follow up needed in the implementing WO. _____

CAUTION

When meeting the performance criteria cannot be demonstrated based on the results of qualified inspection techniques, an engineering analysis, augmented inspection method(s) (e.g., ET diagnostic techniques, PT, video probe), or in situ pressure testing are acceptable alternatives. CM by engineering analysis or augmented inspection methods shall include a rational basis for concluding the performance criteria have been met.

[5] **IF** any selected tube does **NOT** permit the passage of the eddy current probe for a tube inspection, **THEN**

INITIATE a PER and Engineering Justification, **AND**

SELECT an adjacent tube for inspection if less than 100% inspection is performed. _____

[6] **IF** the initial scope of inspection detects degraded or defective tubes or findings for which the Degradation Assessment requires an expansion, **THEN**

EXPAND in accordance with the EPRI PWR Steam Generator Examination Guidelines and the Degradation Assessment with the limiting requirements of Appendix J. _____

[7] **ENSURE** that the hot leg top of tubesheet examination extent is greater than the sludge height for each tube examined. _____

Date _____

6.2 Inspection (continued)

[8] **IF** indications of loose parts (foreign parts) are detected during the ET examinations, **THEN**

A. **DEFINE** a Buffer Zone, **AND** _____

B. **INSPECT** (with ET) as necessary to bound any loose part damage, **AND** _____

C. **EVALUATE** whether secondary side FOSAR is required. [C.2] _____

[9] **IF** secondary side FOSAR identifies the presence of foreign material or secondary side tube damage, **THEN**

EVAUATE if additional eddy current examinations are needed to ensure tube integrity. _____

[10] **IF** a new degradation mechanism is identified that was **NOT** expected to be a potential degradation mechanism in the Degradation Assessment or was not sufficiently addressed in the Degradation Assessment, **THEN**

A. **WRITE** a PER, **AND** _____

B. **DEFINE** a Critical Area and Buffer Zone (if required), **AND** _____

C. **INSPECT** (with ET) to bound the new degradation mechanism. _____

NOTE

Refer to Appendix F definitions to support classification and plugging criteria.

[11] **DOCUMENT** in Appendix A or equivalent the characterization and resolution of all indications of defective tubes and all service induced wall loss indications. _____

[12] **PERFORM** additional SG tube inspections (if necessary) and plug defective tubes and the EPRI PWR Steam Generator Examination Guidelines with Minimum Requirements of Appendix J. _____

[13] **PERFORM** Condition Monitoring [C.20] (CM) in accordance with EPRI Steam Generator Integrity Assessment Guidelines [C.17] and/or Appendix K (Refer to Appendix F definitions)**.** _____

Date _____

6.2 Inspection (continued)

[14] **ENSURE** that if circumferential indications are detected in the U-bend region in larger radius U-bends degraded on the extrados or intrados, the structural limit is 25 Percent Degraded Area unless a Westinghouse evaluation is performed justifying exceeding 25 Percent Degraded Area. _____

[15] **IF** Engineering Analysis shows an indication does not meet structural integrity with 95% probability and 50% confidence, **OR**

IF sizing is not qualified **OR**

IF the ETSS sizing correlation coefficient does not meet the industry guideline requirements **OR**

IF an indication exceeds a Degradation Assessment identified structural screening voltage criteria, **THEN**

PERFORM In-Situ Pressure Testing (where possible) in accordance with EPRI Steam Generator In-Situ Pressure Test Guidelines and the Minimum Requirements in Appendix M to assist in determining whether structural integrity was meet. _____

Date _____

6.2 Inspection (continued)

[16] **ENSURE** the CM Report structural integrity evaluation is performed on each indication (some degradation mechanisms may have the worst indication evaluated as a minimum) of degradation**.** [C.17] [C.21]

Acceptance Criteria: Structural integrity is defined as retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differentials and a safety factor of 1.4 against burst applied to the design basis accidents primary -to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.

SG Program Specialist Signature _____ Date _____

Date _____

6.2 Inspection (continued)

[17] **IF** Engineering Analysis shows a steam generator does not meet leakage integrity with 95% probability and 50% confidence, **OR**

IF an indication exceeds a Degradation Assessment identified leakage screening voltage criteria, **THEN**

PERFORM In-Situ Pressure Testing (where possible) in accordance with EPRI Steam Generator In-Situ Pressure Test Guidelines and the Minimum Requirements in Appendix M to assist in determining whether leakage integrity was meet. _____

[18] **ENSURE** the CM Report leakage integrity evaluation is performed on all indications of degradation. [C.17] [C.21] _____

Acceptance Criteria: The primary-to-secondary accident induced leakage rate for any design basis accident, other than a steam generator tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all steam generators and leakage rate for an individual steam generator. Leakage is not to exceed 1 gpm per steam generator

_____ _____

SG Program Specialist Signature Date

Date _____

6.2 Inspection (continued)

[19] **IF** a Condition Monitoring Failure (CMF) is detected, i.e., any indication fails to meet the performance criteria in NEI 97-06,Steam Generator Program Guidelines, **THEN**

A. **NOTIFY** Plant Management and Licensing of findings and NRC in accordance with 10CFR50.72. _____

B. **WRITE** a PER, [C.21] **AND**

PERFORM a root cause analysis per NPG-SPP-22.300.,**AND** _____

C. **IMPLEMENT** corrective action(s) prior to Mode 4, **AND** _____

D. **NOTIFY** System Engineering of impact to Steam Generator reliability performance criteria, **AND** _____

E. **NOTIFY** the EPRI SGMP within 15 days. _____

[20] **COMPARE** the Condition Monitoring (CM) results for each degradation mechanism to the last Operational Assessment (OA) predictions (both structural integrity and leakage integrity), **AND**

DOCUMENT the comparison in the OA with conclusions regarding validity of the prior cycle OA methodology or needed changes implemented in the current cycle OA methodology **AND**

IF the OA does not bound rthe CM results, **THEN**

WRITE a PER, **AND**

IMPLEMENT corrective action(s) in a Preliminary OA prior to Mode 4. _____

Date _____

6.2 Inspection (continued)

[21] **PERFORM** a review of the Condition Monitoring results to determine growth rates for each Degradation Mechanism, **AND**

IF growth rates are larger than expected in the last Operational Assessment , **THEN**

PREPARE a preliminary Operational Assessment for the affected Degradation Mechanisms prior to plugging so if repair criteria needs to be adjusted the affected tube can be added to the plugging list. _____

NOTE

A Qualified SG Program Specialist must sign as preparer and a lead QDA must sign as Verifier on the Final Plug List.

[22] **REVIEW** indications to determine whether stabilization is required as follows:

A. All OD circumferential indications should be stabilized. _____

B. ID circumferential indications should be evaluated. _____

C. AVB wear should be evaluated based on latest industry information. _____

D. Tubes adjacent to identified Foreign Material which has been removed. _____

[23] **PREPARE** a final list of tubes (which exceed the plugging limit [C.21]) to be plugged or repaired (if applicable), **AND**

PLUG OR REPAIR [C.19] defective tubes per EPRI PWR Steam Generator Examination Guidelines and Appendix J. _____

Date _____

6.2 Inspection (continued)

[24] **CALCULATE** the equivalent tubes plugged value per SG [C.19], **AND**

RECORD below

SG 1 % Plugged	
SG 2 % Plugged	
SG 3 % Plugged	
SG 4 % Plugged	

Acceptance Criteria: The total number of equivalent tubes plugged per SG is less than or equal to 10% (467 tubes).

_____ _____
SG Program Specialist Date

[25] **IF** the total tubes plugged value in any SG approaches acceptance criteria**, THEN,**

NOTIFY Plant Management immediately. _____

[26] **IF** the DA is revised to include a scope expansion, **THEN**

ENSURE eddy current examination are expanded in accordance with EPRI PWR SG Examination Guidelines. _____

[27] **ENSURE** the appropriate Manager has reviewed Appendix A or equivalent and concurs with the characterization and resolution of indications, **AND**

ENSURE the appropriate Manager has discussed Appendix A (or equivalent) with plant management. _____

Date _____

6.2 Inspection (continued)

[28] **ENSURE** the CM Report information has been verified, **AND**

ENSURE its conclusions are verified, **AND**

ENSURE it has been approved by appropriate management, **AND**

ENSURE it is distributed to:

A. ANI/ANII

B. Plant SG Committee

C. EDMS _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES

NOTE

Refer to Appendix F definitions to support classification and plugging criteria.

[1] **RECORD** SG inspected: _____

SG 1	Yes	☐	No	☐		
SG 2	Yes	☐	No	☐		
SG 3	Yes	☐	No	☐		
SG 4	Yes	☐	No	☐		

[2] **PERFORM** a Preliminary Operational Assessment (OA) [C.20] prior to mode 4 in accordance with EPRI Steam Generator Integrity Assessment Guidelines [C.17] and the Minimum Requirements in Appendix L (refer to Appendix F definitions) with a 95 percent probability and 50 percent confidence for both structural and leakage and include secondary side inspection results, [C.7] **AND**

ENSURE that for circumferential indications in the U-bend area in larger radius U-bends degraded on the extrados or intrados, the structural limit is 25 Percent Degraded Area unless Westinghouse evaluation is performed justifying exceeding 25 Percent Degraded Area, **AND**

ENSURE it's conclusions are verified, **AND**

ENSURE it has been approved by SG Program Specialist and appropriate management, **AND**

ENSURE it is distributed to:

A. ANI/ANII _____

B. Plant SG Committee _____

C. EDMS _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[3] **IDENTIFY** the maximum cycle length from step 7.0[2] above, **AND**

IF the maximum cycle length is less than the planned cycle length, **THEN**

NOTIFY plant management. _____

[4] **ENSURE** all required actions have been completed including plugging and /or sleeving all tubes exceeding the plugging limit and all tubes containing through wall cracks.

Acceptance Criteria: Required actions have been completed including plugging all tubes exceeding the plugging limit and all tubes containing through wall cracks.

_____ _____
SG Program Specialist Date

[5] **IF** any foreign objects remain lodged between tubes in any SG's, even those objects remaining lodged from past outages, **THEN**

ENSURE a PER has been initiated, **AND**

ENSURE an Engineering evaluation is completed to evaluate the effect of objects remaining in the SG secondary side on pressure boundary integrity for next operating cycle, **AND**

ENSURE a 10CFR50.59 Review has been completed as required [C.8] _____

[6] **IF** the evaluation completed in step 7.0[5] requires plugging affected tubes, **THEN**

ENSURE tube plugging is completed [C.8]. _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[7] **IF** any SG tubes required plugging, **THEN**

RECORD the total number of tubes plugged per SG. _____

	SG 1	SG 2	SG 3	SG 4
Tubes Plugged				

[8] **VERIFY** that the total equivalent number of tubes plugged per SG is less than or equal to 10% (467 tubes).

Acceptance Criteria: The total number of tubes plugged per SG is less than or equal to 10% (467 tubes).

_____ _____
SG Program Specialist Date

[9] **RECORD** completion time and date on Surveillance Task Sheet. _____

[10] **VERIFY** eddy current data received from the contractor is accurate and complete after inputting raw data the TVA tube examination database management system by:

A. Comparing totals from contractor database by eddy current call to the TVA database.

B. Comparing totals from contractor database by eddy current technique to the TVA database.

C. Verifying retest calls have a resolving exam.

D. Verifying Scan Plan and Scope Expansion Plans, if any, are fulfilled. _____

[11] **CREATE** an action item in the appropriate management action list to ensure industry database information is completed within 120 days after start-up. _____

[12] **CREATE** an action item in the appropriate management action list to update the WBN Unit 2 Steam Generator list of known non-retrieved foreign material _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[13] **CREATE** an action item to ensure WBN SG committee meets within approximately 90 days to discuss outage results and any needed future SG maintenance. _____

[14] **CREATE** an action item to ensure the Operational Assessment is complete within 90 days. _____

[15] **CREATE** an action item to ensure the 180 day report has been completed within 180 days of entering MODE (Appendix D). _____

[16] **CREATE** an action item to ensure the applicable Units Degradation Assessment is prepared 3 months prior to the next SG outage. _____

NOTE

Step 7.0[17] may be N/A if no deviations are identified.

[17] **IF** any deviation to the following industry documents are identified

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines ☐

THEN

A. **ENSURE** a PER is initiated **AND**

B. **ENSURE** a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, **AND** _____

C. **ENSURE** a knowledgeable second party (not necessarily in dependent of the utility) review and approval is obtained prior to implementing the deviation, **AND** _____

D. **ENSURE** that Site Vice President concurrence is obtained for the above **AND** _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

E. **ENSURE** the written deviation and second opinion is promptly forwarded to NEI and EPRI SGMP for posting to their respective websites. **AND** _____

[18] **NOTIFY** Operations Shift Management/Unit Supervisor that this Instruction is complete. _____

8.0 RECORDS

8.1 QA Records

The Data Package is a QA record, is handled in accordance with the approved Document Control and Records Management Program, and contains or references the following:

A. Surveillance Task Sheet.

B. Completed parts of Sections 4.0, 6.2, and 7.0.

C. Section 5.0.

D. Appendix Data Sheets.

E. Other sheets added during the performance.

F. Eddy Current raw data storage medium

G. Contractor Outage Report

H. Degradation Assessment

I. Scan Plan

J. Condition Monitoring Report

K. Operational Assessment (Perliminary)

8.2 Non-QA Records

None

Appendix A
(Page 1 of 3)

Classification of Inspection Results

(TYPICAL)				
Unit	SG	Cycle		

Initial Eddy Current Exam	**SG1**	**SG2**	**SG3**	**SG4**
Full Length Bobbin Coil				
U-Bend Plus Point				
Top of Tubesheet RPC				
Dented TSP Plus Point				

Expansion	**SG1**	**SG2**	**SG3**	**SG4**
Full Length Bobbin Coil				
U-Bend Plus Point				
Dented TSP Plus Point				
Total Exams Completed				
Total Tubes Examined				

Appendix A
(Page 2 of 3)

Classification of Inspection Results

TYPICAL				
Indications (Tubes)	**SG1**	**SG2**	**SG3**	**SG4**
AVB Wear				
AVB Wear				
Cold Leg Thinning				
ODSCC TSP Axial				
ODSCC TSP Circumferential				
ODSCC HTS Axial				
ODSCC HTS Circumferential				
PWSCC TSP Axial				
PWSCC TSP Circumferential				
PWSCC HTS Axial				
PWSCC HTS Circumferential				
PWSCC U-Bend Axial				
PWSCC U-Bend Circumferential				
Loose Parts Damage				

Appendix A
(Page 3 of 3)

Classification of Inspection Results

TYPICAL				
Plugging Status	**SG1**	**SG2**	**SG3**	**SG4**
Previously Plugged Tubes				
Plugged Current Outage by Damage Mechanism				
AVB Wear				
Cold Leg Thinning				
ODSCC TSP Axial				
ODSCC TSP Circumferential				
ODSCC HTS Axial				
ODSCC HTS Circumferential				
PWSCC TSP Axial				
PWSCC TSP Circumferential				
PWSCC HTS Axial				
PWSCC HTS Circumferentia				
PWSCC U-Bend Axial				
PWSCC U-Bend Circumferential				
Loose Parts Damage				
Total				

Preparer _____ Date _____

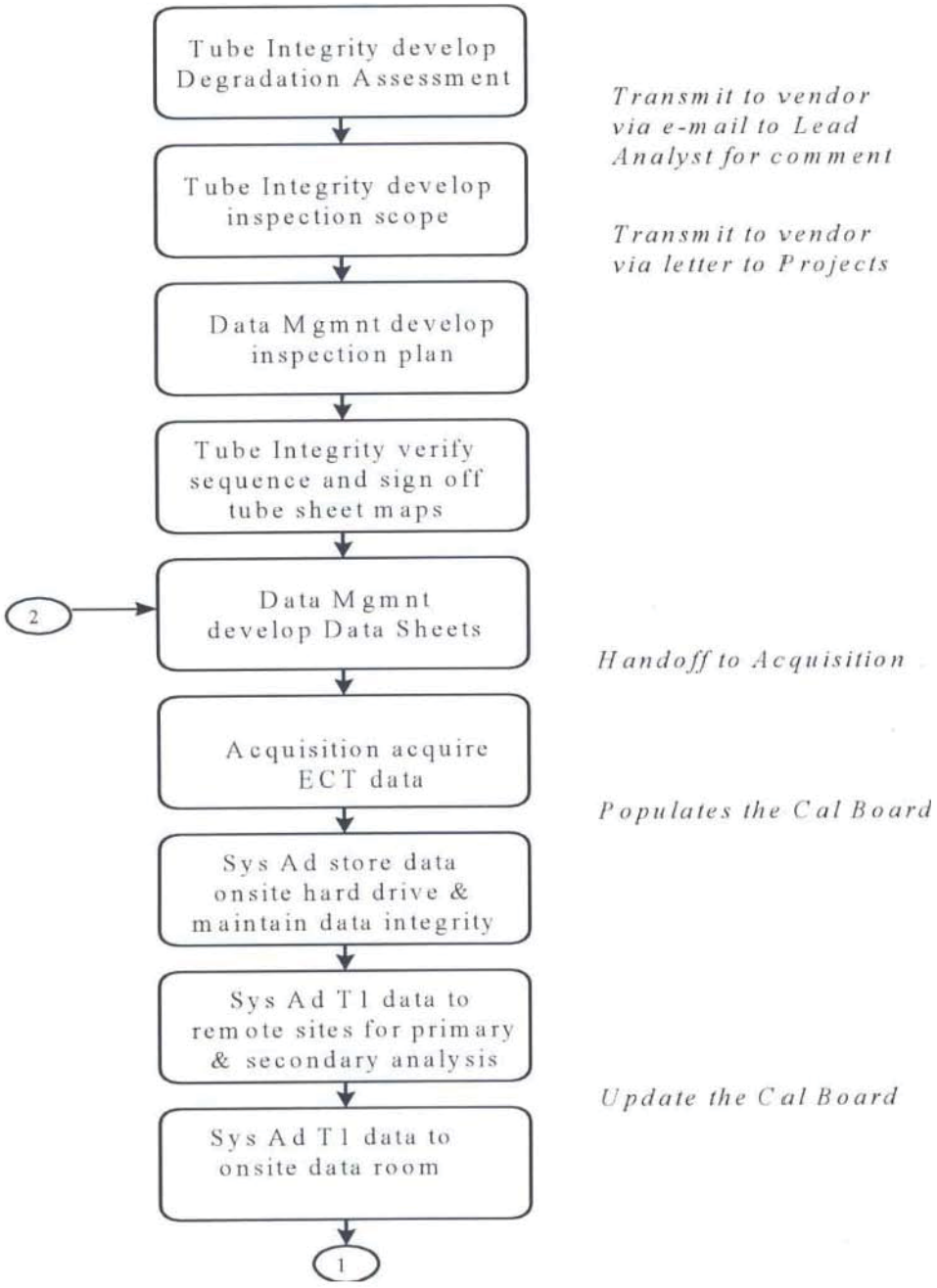
Reviewer _____ Date _____

Appendix B
(Page 1 of 3)

Eddy Current Data Control

(TYPICAL)

EDDY CURRENT DATA CONTROL FLOWCHART

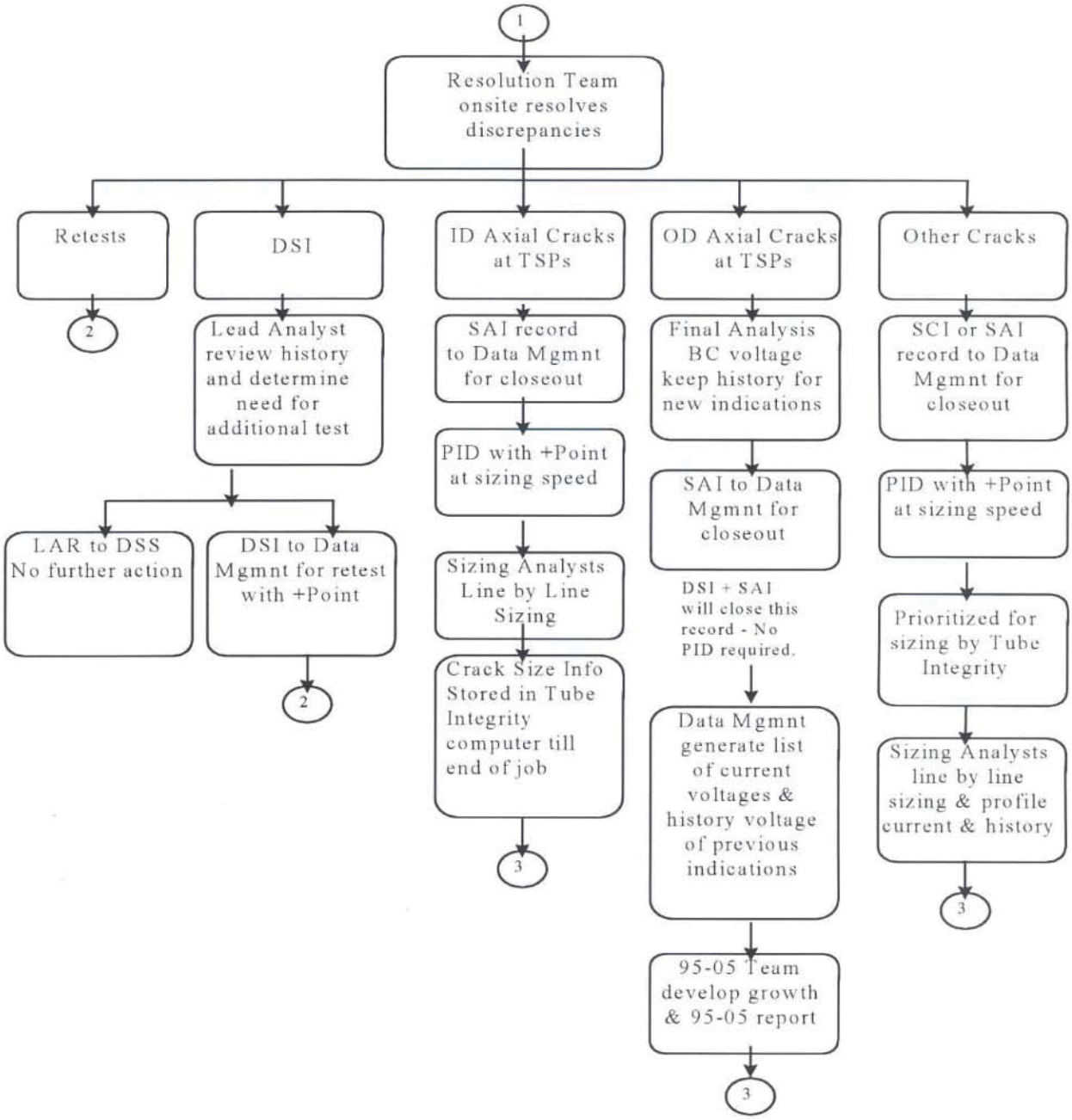


Appendix B
(Page 2 of 3)

Eddy Current Data Control

(TYPICAL)

EDDY CURRENT DATA CONTROL FLOWCHART

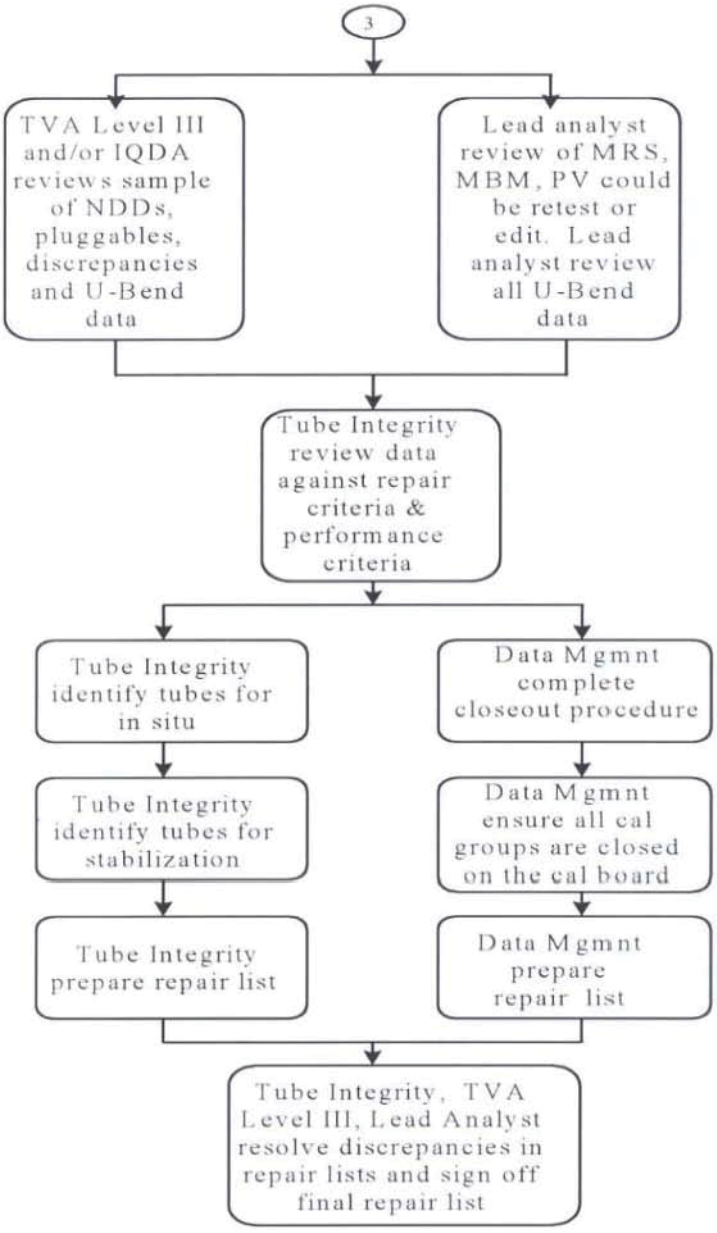


Appendix B
(Page 3 of 3)

Eddy Current Data Control

(TYPICAL)

EDDY CURRENT DATA CONTROL FLOWCHART



Appendix C
(Page 1 of 3)

Additional Augmented Inspections

ADDITIONAL AUGMENTED INSPECTIONS

1.0 SG UPPER INTERNALS INSPECTION [C.21]

A visual inspection shall be performed by a SG Program Specialist (or his designee) on a frequency that ensures all SG's are inspected in 7 refueling cycles. The results shall be documented within the work initiating document for SG secondary-side maintenance.

2.0 SG TUBESHEET INSPECTION [C.2] [C.21] [C.23]

Secondary side visual examinations shall be performed to assist in the verification of tube integrity and performed in accordance with EPRI PWR SG Examination Guidelines. [C.2] The secondary side visual examinations shall be performed each time the secondary side of the SG is opened for maintenance (i.e., sludge lancing, or other secondary side work). A detailed evaluation shall be performed to document the maximum interval between inspections and shall contain the following elements

- Location and description of historical loose parts
- Description of those with associated wear indications
- Failure of control and monitoring foreign objects and loose parts
- High flow or susceptible areas
- Inspection limitations
- Categorization of probable causes, origins, and migration
- Trends for loose parts associated wear
- Eddy current detectability issues
- Every outage visually inspect the internal blowdown piping of the original steam generators to detect and monitor for cracking (similar to Unit 1 OSG cracking).[C.23]

The results of this evaluation shall be considered in the degradation assessment, condition monitoring, and operational assessments.

Appendix C
(Page 2 of 3)

Additional Augmented Inspections

3.0 SLUDGE LANCING AND FOSAR

Sludge Lancing and FOSAR shall be performed every outage in which eddy current inspections are performed.

4.0 PRIMARY-TO-SECONDARY LEAK TEST [C.2]

If primary-to-secondary operational leakage is ≥ 5 GPD or if a SG leakage forced outage occurs, then a secondary side hydrostatic test, bubble test, or helium leak test shall be performed (in accordance with EPRI PWR SG Examination Guidelines) to identify suspect tubes. Once suspect tubes have been identified, then examine leaking tubes (typically with bobbin coil technology) to determine extent, orientation, and morphology. Perform a Root Cause Evaluation in accordance with NPG-SPP-22.300

5.0 SG PRIMARY BOWL DIVIDER PLATE WELD INSPECTION

A remote visual inspection shall be performed by a SG Program Specialist (or his designee) on each SG once during the 10-year interval. The results shall be documented within the work initiating document for SG primary-side maintenance.

6.0 SG SHELL UPPER CONE GIRTH WELD INSPECTION

A visual inspection shall be performed by a SG Program Specialist (or his designee) on each SG once during the 10-year interval. The results shall be documented within the work initiating document for SG secondary-side maintenance.

7.0 WRAPPER INTEGRITY

If sludge lancing is being performed and equipment can **NOT** be inserted without interference, a visual inspection shall be conducted of the lower wrapper support blocks for wrapper drop and/or wrapper cracking. Foreign object search and retrieval is performed each outage and wrapper drop can be checked during this inspection. The results shall be documented within the work initiating document for SG secondary side maintenance.

Appendix C
(Page 3 of 3)

Additional Augmented Inspections

8.0 SUPPORT PLATE INTEGRITY

Automated computerized data screening shall be utilized to identify cracked support plate indications. If adjacent tubes are identified with cracked support plate indications, an RPC inspection will be performed to determine the potential for loose parts.

Appendix D
(Page 1 of 2)

REPORTING REQUIREMENTS

1.0 NRC 180 DAY REPORT

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.7.2.12, "Steam Generator (SG) Program." The report shall include:

A. The scope of inspections performed on each SG,

B. Degradation mechanisms found,

C. Nondestructive examination techniques utilized for each degradation mechanism,

D. Location, orientation (if linear), and measured sizes (if available) of service induced indications,

E. Number of tubes plugged [or repaired] during the inspection outage for each degradation mechanism,

F. The number and percentage of tubes plugged [or repaired] to date, and the effective plugging percentage in each steam generator,

G. The results of condition monitoring, including the results of tube pulls and in-situ testing,

H. Repair method utilized and the number of tubes repaired by each repair method.

2.0 EXAMINATION REPORTS

The inspection vendor shall supply a final report for inclusion in EDMS. The final report shall include a record indicating the tube(s) examined (this may be marked on a tube sheet sketch or drawing), the extent to which each tube was examined, any scanning limitations, the axial location and depth of penetration of each reported degraded tube, and the identification and certification levels of the operator(s) and data evaluator(s) who conducted each examination or part thereof.

A summary of the SG tubing examination shall be submitted to the Site Engineering Responsible Discipline for inclusion in the NIS-1, Owners Report for ISI as required by ASME Section XI. Appendix A or equivalent can serve as this summary.

Appendix D
(Page 2 of 2)

REPORTING REQUIREMENTS

3.0 CONDITION MONITORING FAILURE

Results of tube integrity analysis that indicate failure of structural or leakage integrity shall be reported to the NRC in accordance with 10CFR50.72. [C.21]

- Include root cause evaluation identifying the performance criteria exceeded. [C.21]
- Provide Operational Assessment establishing the basis for the next operating cycle. [C.21]

4.0 REPORTS SHALL BE SUBMITTED TO THE EPRI SGMP ON THE FOLLOWING ITEMS [C.21]

- Any confirmed tube degradation of a type or in a location that has not previously been experienced in a US steam generator, [C.21]
- In-Situ test that result in leakage or burst, [C.21]
- NDE and metallurgical data on any pulled SG tubes, [C.21]
- Any approved technical justifications for deviation from NEI-97-06 and its referenced EPRI Guidelines, [C.21]
- Any significant SG operating experience that has generic implications for the industry, and [C.21]
- Steam Generator inspection results (submitted to the EPRI SGMP Steam Generator Degradation Data Base). [C.21]
- An unplanned shutdown is elected due to primary-to-secondary leakage.
- Inspection results are unexpected and have the potential for generic industry implications.

Appendix E
(Page 1 of 2)

Abbreviations

A. ANI - Authorized Nuclear Inspector

B. ANII - Authorized Nuclear Inservice Inspector

C. APC/ARC - Alternate Plugging Criteria/Alternate Repair Criteria

D. ASME - American Society of Mechanical Engineers

E. AVB - Anti-Vibration Bar

F. CM - Condition Monitoring

G. CMF - Condition Monitoring Failure

H. DA - Degradation Assessment

I. EDMS - Electronic Data Management System

J. EFPD - Effective Full Power Months

K. EOC - End of Cycle

L. EPRI - Electric Power Research Institute

M. ET - Eddy Current

N. ETSS - Examination Technique Specification Sheet

O. FOSAR - Foreign Object Search And Retrieval

P. GPD - Gallons per Day

Q. HTS/TTS - Hot Leg Top of Tubesheet / Top of Tubesheet

R. INPO - Institute of Nuclear Power Operators

S. ISI - Inservice Inspection

T. ISO - TVA's Inservice Inspection Organization

U. LOCA - Loss of Coolant Accident

V. MSLB - Main Steam Line Break

W. NDE - Nondestructive Examination

Appendix E
(Page 2 of 2)

Abbreviations

X. NEI - Nuclear Energy Institute

Y. NIS-1 - Section XI Code-required report to NRC for ISI.

Z. OA - Operational Assessment

AA. ODSCC - Outside Diameter Stress Corrosion Cracking

BB. POD - Probability of Detection

CC. PSI - Preservice Inspection

DD. PWR - Pressurized Water Reactor

EE. PWSCC - Primary Water Stress Corrosion Cracking

FF. QA - Quality Assurance

GG. QDA - Qualified Data Analyst

HH. RFO - Refueling Outage

II. RPC - Rotating Pancake Coil

JJ. SG - Steam Generator

KK. SSE - Safe Shutdown Earthquake

LL. SSPD - Site Specific Performance Demonstration

MM. TS - Tube Support (referring to sleeves)

NN. TSP - Tube Support Plate

OO. TTS - Top of Tubesheet

PP. TZ - Transition Zone (referring to sleeves)

QQ. +Pt - Plus Point rotating coil probe

Appendix F
(Page 1 of 2)

Definitions

A. Condition Monitoring - The evaluation of the state of SG tubing during an outage to verify that degraded tubing at the end of the previous operating period met both structural and leakage integrity performance criteria. This evaluation can be performed either analytically using various mathematical strategies or experimentally performing an in situ pressure test. Each tube damage mechanism shall be evaluated.

B. Critical Area - An area of SG tubing which, on the basis of inspection results, engineering evaluation and related experience, is defined by the type of degradation, the cause of the degradation, and the boundary of the degradation.

C. Degradation - A service-induced cracking, wastage, wear, or general corrosion occurring on either the inside or outside of a tube.

D. Degradation Assessment - An initial assessment of SG degradation mechanisms that are occurring, or potentially can occur, within the units SGs. This assessment is reviewed and updated in a sufficient but practical time period before each upcoming plant outage. The purpose of this early assessment is to identify appropriate NDE technology and performance requirements, and to define inspection sample plans for the subject degradation modes.

E. Degraded Tube - A tube containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation.

F. % Degradation - The percentage of the tube wall thickness affected or removed by degradation.

G. Defect - An imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

H. Examination - Denotes the performance of NDE by personnel who are qualified/certified in accordance with SNT-TC-1A.

I. Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy current testing indications below 20% of the nominal tube wall thickness, if detectable, are to be considered as imperfections.

Appendix F
(Page 2 of 2)

Definitions

J. Operational Assessment - Is similar to Condition Monitoring, but requires that a degradation growth rate be applied to the tube degradation distribution at the beginning of the operating interval to predict the upcoming tube conditions at the end of the operating interval for a given SG. The predicted conditions at the end of the operating interval must meet both the structural and leakage performance criteria for each tube damage mechanism. Effectively, these criteria define the maximum length of the operating interval.

K. Plugging Limit - The imperfection depth at or beyond which the tube shall be removed from service by plugging, or repaired by sleeving in the affected area. The plugging and repair criteria are specified as follows:

1. A sleeved tube shall be plugged if an imperfection is detected in a Westinghouse Alloy 800 leak-limiting sleeve. [C.19]

L. Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operation using the equipment and techniques expected to be used during subsequent ISI's.

M. Scan Plan - A schedule of examinations required to be performed during a particular period of time.

N. Scope Expansion Plan - Additional tube examinations beyond that specified in the Scan Plan required to either meet inspection expansion criteria set forth in the Degradation Assessment and Tech Specs or further characterize existing tube damage mechanisms.

O. Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the point of exit (cold leg side) (i.e., tube end to tube end). Entries may be made from either the hot or cold leg sides and separate entries on the hot leg and cold leg sides on different tubes are allowed. [C.2] For tubes without tubesheet sleeves [C.19] to which the F* criteria is applied, a minimum of 1.5 inches of the tube into the tubesheet from the top of the tubesheet shall be inspected using rotating pancake coil eddy current technique or an inspection method shown to give equivalent or better information on the orientation and length of cracking. [C.12].

Appendix G
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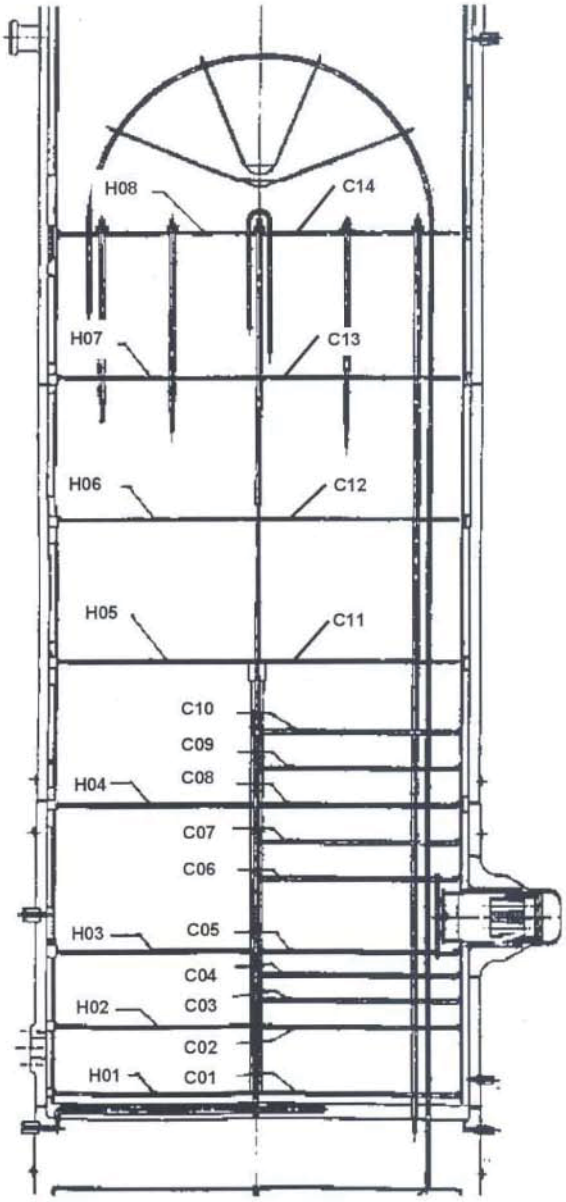
WBN Unit 2 - Tube Bundle Geometry



Note: Preheater Modification Not Shown

Appendix H
(Page 1 of 1)

Tube Integrity Issue Transmittal Form

Issue Number:	
Issue Date:	

Issue Description:

SG Program Specialist Signature _____ Date _____

Issue Resolution:

Signature _____ Date _____

Appendix I
(Page 1 of 2)

Steam Generator Inspection Close-Out Checklist

A. Condition Monitoring (both structural and leakage integrity) performed on each indication of degradation, or, as a minimum, on the worst indication of a particular degradation mechanism. ☐

B. Growth Rate compared to previous Operational Assessment Growth rate for each degradation mechanism which is **NOT** plug-on-detection. ☐

C. Ensure all appropriate three-letter codes are being transmitted to TVA Tube Integrity from vendor ☐

D. Ensure the TVA Outage Date Management System quantities for each indication matches the quantities in the vendor's database. ☐

E. Ensure all defective tubes are on plugging list. ☐

F. Ensure all diagnostic NDE or augmenting NDE is complete. ☐

G. Ensure all issues identified on the "Tube Integrity Issue Transmittal Form" (Appendix L) are resolved. ☐

H. Ensure all "SLG's" are within the top of tubesheet exam extent. ☐

I. Evaluate tubes with NTE, PTE, or equivalent for adequate rotating HTS exam extent ☐

J. Ensure tubes excluded from ODSCC Axial TSP ARC are **NOT** allowed to return to service with DSI or SAI at TSP locations ☐

K. Ensure each F* tube has an appropriate BRT and distance between the indication and the BRT is greater than the F* distance ☐

L. Ensure all 'DSIs' ≥ 1v have been examined with RPC ☐

M. Ensure al l'DSIs' ≥ the upper voltage limit are on the repair list ☐

Appendix I
(Page 2 of 2)

Steam Generator Inspection Close-Out Checklist

Date _____

N. Ensure 'DSIs' are **NOT** at TSP locations with a 'DNT' ≥ 2v ☐

O. Ensure there are no 'DSIs' remaining in service known to extend outside the thickness of the TSP ☐

P. Ensure 'DSIs' are **NOT** at TSP locations with copper deposits. ☐

Q. Ensure "Conditional Burst Probability" is less than $1x10^{-2}$ at MSLB conditions ☐

R. Ensure the total leak rate is less than the allowable limit in the licensing basis for the plant ☐

S. Ensure all hot leg TSP intersections (and cold leg TSP intersections down to the lower TSP intersection at which axial ODSCC has been detected) with 'DNTs' ≥2v are RPC examined ☐

T. Ensure all TSP intersections with large 'MRSs' (such that a 1.0v'DSI' could be hidden) are RPC examined ☐

U. Evaluate all cracked Tube Support Plate indications are evaluated and plug associated tubes if ≥145 degrees is missing ligament support or when connecting CSPs in adjacent tubes are identified ☐

V. Plug all associated tubes with Loose Part Damage if loose part is not removed. ☐

W. Plug all tubes with pitting indications. ☐

Appendix J
(Page 1 of 9)

Degradation Assessment / Pre-Outage Minimum Requirement Check List

1.0 DEGRADATION ASSESSMENT

[1] Shall be updated

[1.1] In a sufficient but practical time period before each upcoming plant outage (approximately 3 months) ☐

[1.2] Prior to the pre-service inspection of new or replacement SGs. ☐

[1.3] Immediately prior to the inspection and include a vendor review and ensure recent industry experience is incorporated. ☐

[1.4] With ETSSs in effect six months prior to the examination. ☐

[1.5] Prior to each outage when SG primary inspections are **NOT** scheduled to validate the surveillance interval. ☐

[2] Shall address the RCS pressure boundary within the SG and include [C.21]

[2.1] plugs, [C.21] ☐

[2.2] sleeves, [C.21] ☐

[2.3] tubes, [C.21] ☐

[2.4] components that support the pressure boundary such as secondary side components. [C.21] ☐

[2.5] foreign material identified previously but un-retrievable and associated SG tubes. ☐

[3] Shall document

[3.1] appropriate SG design information, ☐

[3.2] operation history, ☐

[3.3] chemistry history. ☐

[3.4] temperature sensitive degradation mechanisms ☐

Appendix J
(Page 2 of 9)

Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[3.5] potential BOP and internal steam generator design issues that could create loose part damage to SG tubing (requires communication with feedwater/condensate system engineers). ☐

[3.6] changes in design parameters such as

[3.6.1] plugging levels, ☐

[3.6.2] primary or secondary modifications, ☐

[3.6.3] T-hot ☐

[3.6.4] typical primary to secondary differential pressure. (if more than 50 psi) ☐

[3.7] the accident induced primary to secondary leakage rate assumed in the accident analysis in terms of

[3.7.1] total leakage rate for all SG ☐

[3.7.2] leakage rate for an individual SG. ☐

[3.7.3] ensure the methodology and resulting allowable leakage value is still applicable. ☐

[3.8] In Situ expansion criteria, due to test failures and/or tube leakage, prior to actual testing. ☐

[3.9] justification for skipping secondary side inspections (if applicable)

[3.9.1] discussion of past loose part trends ☐

[3.9.2] discussion of risks ☐

[3.10] contingency plans when only primary work or only secondary work is planned ☐

[3.11] an assessment of any observed operational leakage to determine if adjustment to the inspection program and integrity assessment are warranted. [C.21] ☐

Appendix J
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Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[3.12] Growth rates developed for each existing degradation mechanism. ☐

[3.13] The technical justification whenever credit is taken for physical constraints which affect SIPC. ☐

[3.14] Detection and sizing uncertainties for the entire NDE system performance. ☐

[3.15] Technical justification whenever the sizing data set (minimum quantity 16) correlation coefficient is less than 0.5. ☐

[3.16] Tube stabilization criteria.

[3.16.1] All tubes with circumferential cracking within the expansion transition region or within 0.5” of the bottom of the transition shall be stabilized. ☐

[3.16.2] If analysis provides criteria other than the preceding, then the analysis shall include the effects of the tube being locked at the first tube support plate and the potential for continued growth of the degradation mechanism. ☐

[3.16.3] When plugging for AVB wear, analysis shall consider post-plugging growth to determine the need to stabilize. For example, tubes plugged early in life for significant AVB wear and not stabilized, shall be analyzed to determine if adjacent in-service tubes should be plugged, or if bobbin coil monitoring of adjacent in-service tubes is sufficient. ☐

[3.16.4] Tubes plugged for preheater wear that have been evaluated as part of the preheater wear issue resolution do not have a potential for tube severance and do not require stabilization. However, if an analysis to determine the need for stabilization has not been done, the tube shall be stabilized. ☐

Appendix J
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Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[3.17] When the degradation mechanisms ETSS sizing data (or other data) correlation does not statistically exist between the actual size and the ET indicated size (with a 95% confidence).

[4] Shall identify [C.26]

[4.1] existing and potential Degradation Mechanisms and document degradation mechanisms to be inspected. [C.26] ☐

[4.2] the limiting structural integrity performance criteria and loading conditions for the degradation Mechanisms. [C.26] ☐

[4.3] Condition Monitoring and Operational Assessment structural and leakage limits for existing and potential Degradation Mechanisms and appropriate measurement parameters and uncertainties ☐

[4.4] exam locations ☐

[4.5] sampling sizes ☐

[4.6] Relevant industry operating experience ☐

[4.7] Degradation Mechanism of secondary side components if their failure could prevent the steam generator from fulfilling its intended safety related function. [C.26] ☐

[4.8] Plan for monitoring degradation in tube hardware (such as plugs and sleeves) and secondary side components (such as tube support and anti-vibration bars). ☐

[4.9] Secondary side activities planned for the upcoming outage including sludge lancing and Foreign Object Search And Retrieval plans. ☐

[5] Shall include for each Degradation Mechanism [C.21]

[5.1] base scope, [C.21] ☐

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Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[5.2] exam extent, [C.21] ☐

[5.3] expansion criteria (including secondary side activities)[C.21] ☐

[5.4] Critical area and buffer zones ☐

[5.5] Appropriate NDE technique for detection and sizing with the ETSS identified and document NDE measurement uncertainties. [C.26] ☐

[5.6] structural parameter performance criteria (ensure stated structural parameter accounts for statistical distributions associated with tube material) [C.21] ☐

[5.7] appropriate NDE system performance parameters such as [C.21]

[5.7.1] POD [C.21] ☐

[5.7.2] Technique sizing uncertainties [C.21] ☐

[5.7.3] Analyst sizing uncertainties ☐

[5.7.4] Detection uncertainties. ☐

[5.8] repair limit [C.21]

[5.8.1] evaluate to ensure the repair limit is adequate to support an Operational Assessment [C.21] ☐

[5.8.2] If Tech Spec has an applicable limit, then the more limiting (Tech Spec vs. repair limit) shall be used. ☐

[5.8.3] If Tech Spec depth based repair limit is applied to a Degradation Mechanism, then ensure the assumptions used to derive the repair limit are justified. ☐

[5.9] Plant specific In-Situ pressure test screening threshold values for [C.21]

Appendix J
(Page 6 of 9)

Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[5.9.1] structural [C.21] ☐

[5.9.2] leakage [C.21] ☐

[5.9.3] developed using 95% lower tolerance limit material property values, or developed using ASME Code minimum values. [C.21] ☐

[5.10] technical justification for defining critical areas and buffer zones when less than a 100% sample is examined. [C.21] ☐

[6] Shall include

[6.1] for each technique

[6.1.1] The determination that a technique has been site validated. ☐

[6.1.2] If **NOT** site validated, then the probability of detection (POD) values shall be reported. ☐

[6.1.3] Whether the techniques and personnel requirements are identified in the EPRI PWR Steam Generator Examination Guidelines ☐

[6.1.4] Whether NDE technique identified for each inspection is appropriate for integrity assessment when applied to the SGs in this unit. ☐

[6.1.5] An evaluation of alternate NDE techniques used for detection ☐

[6.1.6] An evaluation of NDE techniques used in other applications where they have **NOT** been formally qualified ☐

[6.2] The requirement that all tubes with expansions transitions significantly outside the tubesheet region shall be inspected (SGMP-IG-07-01). ☐

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Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[6.3] corrective actions if previous Condition Monitoring violated performance criteria ☐

[6.4] Operational leakage (if any) for this cycle to date ☐

[6.5] A review of the effects of chemistry excursions and intrusions in addition to loose parts and foreign material on plugged tubes along with in-service tubes. ☐

[6.6] Or references Secondary Side Integrity Plan which

[6.6.1] Documents justification and critical thinking when sludge lance or FOSAR is not planned. ☐

[6.6.2] Includes contingency planning for exceeding water chemistry guideline or known foreign material identified in the feedwater train ☐

[6.6.3] Includes operating experience from all PWRs. ☐

[7] Shall consider and meet applicable section of

[7.1] NEI Review Board decisions, ☐

[7.2] interim guidance [C.21] , ☐

[7.3] lessons learned found in the NEI members-only web page, ☐

[7.4] EPRI SG Degradation Database, ☐

[7.5] INPO reviews, and ☐

[7.6] INPO web site information. ☐

[7.7] OE ☐

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Degradation Assessment / Pre-Outage Minimum Requirement Check List

Date _____

1.0 DEGRADATION ASSESSMENT (continued)

[8] Shall

[8.1] ensure that any deviation to the following industry documents are identified

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines ☐

[8.2] ensure a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, and ☐

[8.3] ensure a knowledgeable second party (not necessarily independent of the utility) review and approval is obtained prior to implementing the deviation, and ☐

[8.4] ensure that Site Vice President concurrence is obtained for the above and ☐

[8.5] ensure the written deviation and second opinion is promptly forwarded (within 45 days of VP concurrence) to NEI and EPRI SGMP for posting to their respective websites. and ☐

[8.6] ensure that a PER is written on the deviations and. ☐

[8.7] ensure management concurrence is EDMS retrievable. ☐

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Degradation Assessment / Pre-Outage Minimum Requirement Check List

1.0 DEGRADATION ASSESSMENT (continued)

[9] Shall notify the NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: ☐

- The guidance being deviated from
- Justification for this deviation, and
- Any actions undertaken in lieu of the guidance

[10] Shall limit the structural integrity limit for U-bend circumferential indications in larger radius U-bends degraded on the extrados or intrados to 25 Percent Degraded Area unless an evaluation has been developed by Westinghouse to increase the limit. ☐

[11] A secondary side detailed evaluation shall be performed to document the maximum interval between inspections and shall contain the following elements:

[11.1] Location and description of historical loose parts, ☐

[11.2] Description of those with associated wear indications, ☐

[11.3] Failure of control and monitoring foreign objects and loose parts, ☐

[11.4] High flow or susceptible areas, ☐

[11.5] Inspection limitations, ☐

[11.6] Categorization of probable causes, origins and migration, ☐

[11.7] Trends for loose parts associated wear, ☐

[11.8] Eddy current detectability issues. ☐

SG Program Specialist Signature _____ Date _____

Appendix K
(Page 1 of 6)

Condition Monitoring Minimum Requirement Check List

1.0 CONDITION MONITORING

[1] Shall evaluate

[1.1] All active degradation mechanisms (including any new degradation mechanisms) for ☐

[1.1.1] structural integrity performance criteria ☐

[1.1.2] Shall limit the structural integrity for U-bend circumferential indications in larger radius U-bends on the extrados or intrados, to 25 Percent Degraded Area unless an evaluation has been developed by Westinghouse to increase the limit. ☐

[1.1.3] accident induced leakage integrity performance criteria (including APC leakage) in accordance with the latest revision of EPRI integrity assessment guidelines ☐

[2] Shall assess (as a minimum for the largest flaws)

[2.1] if supplemental NDE is needed ☐

[2.2] if In-Situ Pressure testing should be performed. ☐

[3] Shall include

[3.1] evaluation methods, margins and consideration of uncertainties as described in the EPRI Steam Generator Integrity Assessment Guidelines [C.21] ☐

[3.2] a summary of plant In-Situ Pressure test screening criteria (in accordance with EPRI SG In-Situ Pressure Test Guidelines,

[3.2.1] screening criteria

[3.2.2] objectives ☐

[3.2.3] candidate selection basis ☐

[3.2.4] results

Appendix K
(Page 2 of 6)

Condition Monitoring Minimum Requirement Check List

Date _____

1.0 CONDITION MONITORING (continued)

[3.3] adjustment to condition monitoring assessment when less than 100% sample is performed on a degradation mechanism

[3.4] documentation of such level a peer could reach the same conclusion ☐

[3.5] a root cause determination (only for forced outages) ☐

[3.6] causal analysis and corrective actions (when performance criteria is **NOT** met) ☐

[3.7] adjustments to account for statistical distributions associated with tube material properties. If the ASME code equation is used, code minimum properties shall be used. ☐

[3.8] A detailed evaluation of the results of secondary side inspection identifying:

[3.8.1] foreign material removed ☐

[3.8.2] foreign material remaining in the steam generator, ☐

[3.8.3] maximum interval between inspections, ☐

[3.8.4] Location and description of historical loose parts, ☐

[3.8.5] Description of those with associated wear indications, ☐

[3.8.6] Failure of control and monitoring foreign objects and loose parts, ☐

[3.8.7] High flow or susceptible areas, ☐

[3.8.8] Inspection limitations, ☐

[3.8.9] Categorization of probable causes, origins, and migration, ☐

[3.8.10] Trends for loose parts associated wear, ☐

Appendix K
(Page 3 of 6)

Condition Monitoring Minimum Requirement Check List

Date _____

1.0 CONDITION MONITORING (continued)

[3.9] Eddy current detectability issues ☐

[3.10] Engineering justification to justify the lack of inspection of a tube or portion of a tube when eddy current probes cannot pass through a tube; including rotating probe inability to complete any portion of the examination in a tube. ☐

[4] Shall document

[4.1] the screening of indications for In-Situ Pressure testing. ☐

[4.2] a comparison of cycle operation leakage to

[4.2.1] performance criteria ☐

[4.2.2] indications found ☐

[4.3] a comparison to the previous Operational Assessment

[4.3.1] causal analysis if significant difference ☐

[4.3.2] corrective actions if significant difference ☐

[5] Shall

[5.1] Ensure that any deviation to the following industry documents are identified:

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines, then

[5.2] Ensure a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, and ☐

Appendix K
(Page 4 of 6)

Condition Monitoring Minimum Requirement Check List

Date _____

1.0 CONDITION MONITORING (continued)

[5.3] Ensure a knowledgeable second party (not necessarily independent of the utility) review and approval is obtained prior to implementing the deviation, and ☐

[5.4] Ensure that Site Vice President concurrence is obtained for the above, and ☐

[5.5] Ensure the written deviation and second opinion is promptly forwarded (within 45 days of the VP concurrence) to NEI and EPRI SGMP for posting to their respective websites, and ☐

[5.6] Ensure that a PER is written on the deviations. ☐

[5.7] Ensure management concurrence is EDMS retrievable. ☐

[6] Shall notify the NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: ☐

- The guidance being deviated from
- Justification for this deviation, and
- Any actions undertaken in lieu of the guidance

[7] Shall ensure

[7.1] all appropriate 3-letter codes are being transmitted to TVA Tube Integrity from the vendor. ☐

[7.2] that if one or more tubes fail to satisfy performance criteria, NRC has been notified in accordance with 10CFR50.73. ☐

[7.3] all tubes exceeding the repair limit during the inspection have been repaired and in all cases the Tech Spec limit has **NOT** been exceeded. ☐

Appendix K
(Page 5 of 6)

Condition Monitoring Minimum Requirement Check List

Date _____

1.0 CONDITION MONITORING (continued)

[7.4] that if it is necessary to extend NDE techniques, that those techniques are qualified for a particular application to other applications where they have **NOT** been formally qualified under EPRI PWR SG Examination Guidelines Appendix H or Appendix I, then a technical evaluation must be performed and such use shall be for the purpose of repair on detection only and **NOT** to allow a tube to remain in-service. ☐

[7.5] all tubes with indications exceeding In-Situ critical screening voltages or other screening criteria have been In-Situ Pressure tested. ☐

[7.6] that where indications are >0.4 volts OD and >0.5 volts ID and where the degradation mechanisms ETSS sizing data (or other data) correlation does not statistically exist between the actual size and the ET indicated size (sith a 95% confidence) then either a technical justification shall be provided or the EPRI Steam Generator In-Situ Pressure Test Guidelines, "Guidance on Tube Selection When Sizing Is Not Qualified," shall be followed. ☐

[7.7] the flow rate, pressure, and temperature conditions used in the determination of the accident induced leakage rate shall be consistent with those assumed in the most limiting design basis accident (other than a steam generator tube rupture) analysis for the plant. ☐

[7.8] the leakage integrity evaluation for accident induced leakage is the upper 95th percentile leak rate for the entire steam generator from all sources (including sleeves, plugs, re-rolls, and any other repair process) which shall not exceed the leakage integrity performance criteria. ☐

[7.9] that statements of no leakage for indications are made at 0.95 probability with 50% confidence. ☐

Appendix K
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Condition Monitoring Minimum Requirement Check List

Date _____

1.0 CONDITION MONITORING (continued)

[7.10] the leakage integrity evaluation shall account for the sample size which when less than 100% shall account for possible indications in locations that are not inspected. ☐

[7.11] For volumetric indications, that the relevant EPRI Flaw Handbook burst pressure equations are utilized at MSLB pressure differential (with material property, NDE sizing, and equation uncertainties included) to determine degradation dimensions required for leakage to develop. ☐

[7.12] that the corrected equations 5-26 and 5-27 from EPRI Steam Generator Degradation Specific Management Flaw Handbook are utilized (refer to SGMP-IG-06-01, Interim Guidance to the Steam Generator Degradation Specific Management Flaw Handbook, dated October 18, 2006). ☐

[7.13] that if circumferential degradation is discovered in a bending stress region (i.e., intrados or extrados of U-bends) then the leakage assessments shall be performed in accordance with EPRI Technical Report "Impact of Bending Loads on Leakage Integrity of Steam Generator Tubes" (#1014660) dated January 2007. ☐

_____ _____
SG Program Specialist Date

Appendix L
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Operational Assessment Minimum Requirement Check List

1.0 OPERATIONAL ASSESSMENT

[1] Shall ensure Growth Rate(s)

[1.1] distributions have been developed

[1.1.1] for each active degradation mechanism identified in the Degradation Assessment and ☐

[1.1.2] based on the most recent inspection results (or the most recent one or two inspections) and ☐

[1.1.3] reflecting any increase or decrease in the projected cycle length ☐

[1.1.4] using industry recommended techniques. ☐

[1.1.5] with a bounding growth rate value for each active degradation mechanism ☐

[1.1.6] utilizing all detected indications identified prior to implementing repair activities ☐

[1.2] from another plant are bounding (if utilized). ☐

[1.3] which change significantly after the parameter reaches a threshold value, have appropriate models developed for use in Operational Assessments. ☐

[2] Utilizing the Arithmetic or Simplified Statistical methodology,

[2.1] shall have an estimate of the largest flaw potentially left in service at the beginning of the operating period which is the

[2.1.1] upper 95^{th} percentile (if greater than or equal to 50 data points) or ☐

[2.1.2] greatest growth rate (if less than 50 data points). ☐

[2.1.3] lower 95 percentile tube material properties at design temperature. ☐

Appendix L
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Operational Assessment Minimum Requirement Check List

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1.0 OPERATIONAL ASSESSMENT (continued)

[3] Utilizing the Monte Carlo approach

[3.1] shall compare the growth rate distribution from each SG to the distribution for all SG. ☐

[3.2] shall ensure the model accounts for the tail of the distribution ☐

[3.3] shall be adjusted to account for indications in locations that are **NOT** inspected. ☐

[3.4] shall account for statistical distribution associated with tube material properties at design temperatures. ☐

[4] shall include

[4.1] all active degradation mechanisms appropriately in a Operational Assessment. ☐

[4.2] uncertainties at the confidence bounds provided in the EPRI Steam Generator Integrity Assessment Guidelines. ☐

[4.3] technique uncertainty and analyst uncertainty ☐

[4.4] analysis showing that integrity (both structural and leakage) will be maintained with a 0.95 probability and 50% confidence throughout the next operational interval between inspections or the next operational interval shall be decreased and plant management shall be notified. ☐

[4.5] analysis assuming a population of flaws existing in the SG at the beginning of the next operating period (for leakage integrity analysis) ☐

[4.6] adjusted strategies if Condition Monitoring Performance Criteria was violated ☐

[4.7] documentation of such a level that a peer could reach the same outcome as the originator. ☐

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Operational Assessment Minimum Requirement Check List

Date _____

1.0 OPERATIONAL ASSESSMENT (continued)

[4.8] causal analysis (if Condition Monitoring fails performance criteria). ☐

[4.9] a root cause determination (if a forced SG leakage outage occurs). ☐

[4.10] a prediction of operational leakage. ☐

[4.11] a justification for operating the planned interval between secondary side inspections. ☐

[4.12] discussion of the effect known foreign material left in the SG has on tube integrity during the covered duration. ☐

[5] Shall

[5.1] Ensure that any deviation to the following industry documents are identified:

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines, then ☐

[5.2] Ensure that a PER is written on the deviations, and ☐

[5.3] Ensure a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, and ☐

[5.4] Ensure a knowledgeable second party (not necessarily independent of the utility) review and approval is obtained prior to implementing the deviation, and ☐

[5.5] Ensure that Site Vice President concurrence is obtained for the above and ☐

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Operational Assessment Minimum Requirement Check List

Date _____

1.0 OPERATIONAL ASSESSMENT (continued)

[5.6] Ensure the written deviation and second opinion is promptly forwarded (within 45 days of VP concurrence) to NEI and EPRI SGMP for posting to their respective websites. and ☐

[5.7] Ensure management concurrence is EDMS retrievable. ☐

[6] Shall notify the NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: ☐

- The guidance being deviated from
- Justification for this deviation, and
- Any actions undertaken in lieu of the guidance

[7] If In Situ pressure testing was used

[7.1] for Condition Monitoring/Operational Assessment, then

[7.1.1] assess In Situ test results for Operational Assessment and ☐

[7.1.2] perform an engineering evaluation to demonstrate that conditions for the upcoming operating interval have **NOT** changed in a manner that will impact end of cycle conditions. ☐

[7.2] document a summary of plant In-Situ Pressure test

[7.2.1] screening criteria, ☐

[7.2.2] objectives ☐

[7.2.3] candidate selection basis ☐

[7.2.4] results ☐

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Operational Assessment Minimum Requirement Check List

Date _____

1.0 OPERATIONAL ASSESSMENT (continued)

[8] Shall ensure

[8.1] That the Operational Assessment for the forced outage assesses whether incorrect assumptions or errors in the past Condition Monitoring or Operational Assessment reports were the root cause of the forced outage. ☐

[8.2] That primary to secondary leakage rate for the most limiting postulated design basis accident (other than steam generator tube rupture) is assessed from all sources including degraded tube plugs, sleeves, re-rolls and any other repair process. ☐

[8.3] That the Operational Assessment contains a projection of leakage at normal operating conditions and that the projection assesses all potential sources such as alternate repair criteria, plugs, sleeves, re-rolls, degradation within tubesheet expansion regions, and degradation in regions not precluded from burst. ☐

[8.4] That the Operational Assessment include adjustments to input parameters if the comparison of Condition Monitoring results (both structural and leakage) to the previous Operational Assessment of the previous OA growth rates or predictions were not conservative. ☐

[8.5] that the corrected equations 5-26 and 5-27 from EPRI Steam Generator Degradation Specific Management Flaw Handbook are utilized (refer to SGMP-IG-06-01, Interim Guidance to the Steam Generator Degradation Specific Management Flaw Handbook, dated October 18, 2006). ☐

[8.6] that if circumferential degradation is discovered in a bending stress region (i.e., intrados or extrados of U-bends) then the leakage assessments shall be performed in accordance with EPRI Technical Report "Impact of Bending Loads on Leakage Integrity of Steam Generator Tubes” (#1014660) dated January 2007 (SGMP-IG-07-1). ☐

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Operational Assessment Minimum Requirement Check List

Date _____

1.0 OPERATIONAL ASSESSMENT (continued)

[9] Shall limit the structural integrity for U-bend circumferential indications in larger radius U-bend extrados or intrados, to 25 Percent Degraded Area unless an evaluation has been developed by Westinghouse to increase the limit. ☐

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In-Situ Pressure Testing Minimum Requirement Check List

1.0 IN-SITU PRESSURE TESTING

[1] In-Situ screening parameters shall be developed and included in the Degradation Assessment which

[1.1] ensure that a representative sample of the most limiting structural integrity indications is tested. ☐

[1.2] ensure that a representative sample of the most limiting leakage integrity indications is tested. ☐

[1.3] ensure all appropriate levels of uncertainty have been included ☐

[1.4] follow the screening methodology in the EPRI Steam Generator In Situ Pressure Test Guidelines ☐

[2] In Situ Test sample size and selection of tubes

[2.1] are based on NDE inspection results in terms of a structural parameter (such as, depth, length, and/or voltage amplitude) ☐

[2.2] selection or omission of test candidates rational has been documented as part of the screening process. ☐

[2.3] include

[2.3.1] All tubes with visible leakage identified during the outage or during a secondary side leak test that are NOT associated with leak-limiting repairs or are NOT exempt shall be In-Situ tested unless the leaking section of tube will be pulled for destructive analysis. ☐

[2.3.2] All tubes that require proof testing shall also be leak tested. ☐

[2.3.3] All axial and circumferential indications that require leak testing shall also be proof tested except where exemptions are defined within the EPRI SG In Situ Pressure Test Guidelines. ☐

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In-Situ Pressure Testing Minimum Requirement Check List

Date _____

1.0 IN-SITU PRESSURE TESTING (continued)

[2.3.4] New degradation (never seen in U.S. industry) that does **NOT** fall within the guidance of EPRI In-Situ Guidelines Appendix D shall be In-Situ pressure tested unless the leaking section of tube will be pulled for destructive analysis. ☐

[2.3.5] documentation of the exemptions from In-Situ pressure testing guidelines. ☐

[2.3.6] All flaws shall be screened for both leakage and proof testing. ☐

[2.3.7] In order to extrapolate pressure test pressure test results from ambient In-Situ testing conditions to service conditions, correction for temperature effects on the yield and ultimate strength of the tubing shall be used. ☐

[2.3.8] Some additional margin shall be added to test pressures to cover pressure measurement uncertainty corresponding to the specific test instrumentation being used. ☐

[3] In Situ expansion criteria, due to test failures and/or tube leakage, has been identified prior to actual testing. ☐

[4] In-Situ pressure test result total leakage from the most limiting SG

[4.1] has been assessed against the unit's allowable leak limit calculated for the faulted SG during the limiting accident conditions or ☐

[4.2] against plant licensing basis. ☐

[5] In situ test result

[5.1] leak rates

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In-Situ Pressure Testing Minimum Requirement Check List

Date _____

1.0 IN-SITU PRESSURE TESTING (continued)

[5.1.1] have been corrected from test conditions to accident thermal hydraulic conditions for comparison to the specified limits (including flashing/phase change) ☐

[5.2] have been verified and reviewed to identify any requirements for additional tests. ☐

[6] If In-Situ test results in leakage or burst, then report leakage or burst to EPRI E&R IRG within 15 days. ☐

[7] If the In-Situ test results fail acceptance criteria, then report failures as required by NEI 97-06. ☐

[8] Shall

[8.1] Ensure that any deviation to the following industry documents are identified:

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines, then

[8.2] Ensure that a PER is written on the deviations, and ☐

[8.3] Ensure a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, and ☐

[8.4] Ensure a knowledgeable second party (not necessarily independent of the utility) review and approval is obtained prior to implementing the deviation, and ☐

[8.5] Ensure that Site Vice President concurrence is obtained for the above, and ☐

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In-Situ Pressure Testing Minimum Requirement Check List

Date _____

1.0 IN-SITU PRESSURE TESTING (continued)

[8.6] Ensure the written deviation and second opinion is promptly forwarded (within 45 days of VP concurrence) to NEI and EPRI SGMP for posting to their respective websites. and ☐

[8.7] Ensure management concurrence is EDMS retrievable. ☐

[9] Shall notify the NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: ☐

- The guidance being deviated from
- Justification for this deviation, and
- Any actions undertaken in lieu of the guidance

[10] If a 0.4 Volt Max OD or 0.5 Volts Max ID screening criteria is used with a +Pt or pancake coil, then the calibration shall be normalized to 20 volts on a 100% TW notch, 3/8" length at 300 KHz. ☐

[11] If sizing capabilities are fully quantified and sizing is utilized as the screening criteria, then the guidance of EPRI In-Situ Pressure Testing Guidelines, Rev 4 Section 4.5.2 shall be followed. ☐

[12] If sizing capabilities are **NOT** quantified, then the guidance of EPRI In-Situ Pressure Testing Guidelines, Rev 4 Appendix C shall be followed. ☐

[13] If mixed mode indications (an axial and circumferential crack located in proximity to each other) are detected, then the guidance of EPRI In-Situ Pressure Testing Guidelines, Rev 4, Section 4.7 shall be followed. ☐

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In-Situ Pressure Testing Minimum Requirement Check List

Date _____

1.0 IN-SITU PRESSURE TESTING (continued)

[14] If performance criteria are **NOT** satisfied or if leakage is observed during testing for a flaw at or near the screening values, then the screening values shall be reviewed. It may be necessary to revise the values, re-screen indications that did **NOT** require testing, and perform additional In-Situ testing. ☐

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NDE Eddy Current Minimum Requirement Check List

1.0 EDDY CURRENT EXAMINATIONS

[1] Inspection of SG tubes shall be conducted using qualified techniques capable of detecting and characterizing the degradation. [C.2] ☐

[2] The qualification of NDE techniques comply with the requirements specified in Appendices H and I of the EPRI PWR Steam Generator Examination Guidelines [C.2]. ☐

[3] The Site Specific Performance Demonstration program has been prepared or approved by TVA's Level III. ☐

[4] The testing requirements of the EPRI PWR Steam Generator Examination Guidelines (i.e., Appendix G) have been used for the Site Specific Performance Demonstration for each Examination Technique Specification Sheet to be used during the examination and **NOT** covered in the Qualified Data Analyst qualification or another Site Specific Performance Demonstration [C.2]. ☐

[5] The site quality assurance organization or a designated organization approved by the site will perform real-time surveillance of critical aspects of the SG examination and tube repair processes. ☐

[6] The NDE of tubes shall be conducted using techniques capable of detecting and / or sizing the degradation mechanisms identified in the Degradation Assessment and to provide the information necessary for completing the tube integrity and leakage assessments. ☐

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NDE Eddy Current Minimum Requirement Check List

Date _____

1.0 EDDY CURRENT EXAMINATIONS (continued)

[7] Perform a site validation of examination techniques to ensure that the detection and sizing capabilities developed in accordance with Appendix H or Appendix I are applicable to site-specific conditions for each damage mechanism identified in the Degradation Assessment [C.2] . ☐

[7.1] The site validation shall be accomplished through a documented pre-inspection review of: [C.2]

[7.1.1] All essential variables on the qualified ETSS as compared to the site specific ETSS to determine equivalency and shall include dent or ding analysis and reporting when addressed in the qualified ETSS (i.e., is the site dent or ding calibration and sizing criteria [voltage, channel and normalization] equivalent to the ETSS) [C.2] . ☐

[7.1.2] Site-specific signals (for existing degradation mechanisms only compared to ETSS signals to determine if the degradation mechanisms are characterized correctly [C.2] . ☐

[7.1.3] A qualified technique's tubing essential variables to ensure that the application is consistent with site-specific SG conditions. This review establishes that the tubing extraneous test variables (for example, denting, deposits, tube geometry, noise) of the tubes in the qualification data set are comparable in voltage, phase and signal characteristics to in-generator signals, or determines if the potential exists to degrade the probability of detection (POD) [C.2] . ☐

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NDE Eddy Current Minimum Requirement Check List

Date _____

1.0 EDDY CURRENT EXAMINATIONS (continued)

[8] The calibration standard design shall meet the following criteria:

[8.1] Rotating and array probe calibration standards [C.2]

[8.1.1] Electro discharge machining (EDM) notches with a minimum length of 0.375 in. (9.525 mm) and a width of 0.005 in. (+0.001 in. - 0.002 in.) (0.127 mm [+0.025 mm -0.051 mm]) with the following depths. [C.2] ☐

[8.1.2] 100% TW axial and circumferential EDM notches. [C.2] ☐

[8.1.3] 60% TW inside diameter (ID) and outside diameter (OD) axial and circumferential EDM notches. [C.2] ☐

[8.1.4] 40% TW ID and OD axial and circumferential EDM notches. [C.2] ☐

[8.2] Additional array probe calibration standard artifacts:

[8.2.1] 30% TW OD circumferential groove 360 degrees with a minimum width of 0.500 in. (12.700 mm) (+0.002 in [+0.051 mm] tolerance on depth). [C.2] ☐

[8.2.2] An artifact sufficient to establish channel ordering, such as 30% TW OD spiral groove. [C.2] ☐

[8.2.3] 0.008 in (+0.001 in. -0.002 in.) (0.203 mm[+0.025 mm-0.051 mm]) radial variation (360 degrees) for an axial distance sufficient to cover the entire array. ☐

[8.3] Where the above cannot be met, alternative notches may be used. Equivalency shall be established for voltage, phase, and span settings in relation to ETSS calibration requirements. [C.2] ☐

[8.4] A liftoff reference signal is recommended to facilitate evaluation of signals influenced by local profile changes. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

Date _____

1.0 EDDY CURRENT EXAMINATIONS (continued)

[8.5] Additional requirements as specified in the plant specific procedure or ETSS. [C.2] ☐

[8.6] The design of special calibration standards for other plant specific ETSSs which cover unique degradation mechanisms or repair processes such as plugs and sleeves, shall be defined in the plant specific procedure or ETSS. [C.2] ☐

[9] Voltage normalization values provide the industry with comparable results and can be used to perform comparisons, trending, or help justify results transients or anomalies. [C.2]

[9.1] For the bobbin coil technique, the voltage normalization shall be accomplished as follows:

[9.1.1] Establish voltages in accordance with the analysis set-up instructions. [C.2] ☐

[9.1.2] When using a repair criterion based on the correlation of a technique parameter to a structural parameter (for example, voltage versus burst pressure) normalized to a single reference standard, the transfer standard method of voltage correction, as defined by the alternate repair criteria, may be applied for NDE parameter normalization in the field to maintain consistency to that correlation, or [C.2] ☐

[9.1.3] Normalize all standards in accordance with site ETSS. [C.2] ☐

[9.2] For the rotating probe technique, the voltage values shall be set to 20 volts peak-to-peak on the appropriate 100% TW notch, at the maximum amplitude response near the center of the flaw, individually for each channel. Appropriate notch means a circumferential notch for a circumferential sensitive channel and an axial notch for axial sensitive and non-directional channels. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

Date _____

1.0 EDDY CURRENT EXAMINATIONS (continued)

[9.3] For the array probe technique, the voltage shall be set in accordance with site ETSS. [C.2] ☐

[10] Instrument digitization rate and pull speed:

[10.1] For bobbin coil examinations shall be adjusted to obtain a minimum sample rate of 30 samples / inch (30 samples / 25.4 mm) as established by ASME code. [C.2] ☐

[10.2] For rotating and array probe techniques, the minimum sample rates shall be in accordance with the ETSS or as site validated. [C.2] ☐

[11] Personnel training and qualification requirements shall be in accordance with EPRI PWR SG Examination Guideline, Appendix G for NDE personnel who analyze eddy current data for PWR SG tubing. [C.2] ☐

[12] All analysis personnel shall be QDA in accordance with EPRI PWR SG Examination Guideline, Appendix G. [C.2] ☐

[13] All personnel involved in the analysis of degradation shall successfully complete an SSPD for the current outage in accordance with EPRI PWR SG Examination Guideline, Appendix G. [C.2] ☐

[14] Site specific analysis guidelines (which provide structure to the analysis process and promote consistency and reliability in performing data analysis) shall:

[14.1] Be based on the ETSS for all techniques planned for use, and [C.2] ☐

[14.2] Be prepared in a manner that will encourage an analyst to identify possible flaw signals where new conditions are encountered or in situations where the analyst is uncertain about the correct classification of a signal. [C.2] ☐

[14.3] Implement a process to track changes made in the guidelines to document that program changes have been acknowledged and understood. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[14.4] Define what constitutes change in terms of voltage and/or phase angle in the Lissajous signal when historical reviews are performed. [C.2] ☐

[14.5] Provide additional precautionary guidance to data analysts on reporting indications that read zero percent TW if the analyst believes the indication is real degradation being influenced, or not, by extraneous test variables. [C.2] ☐

[15] To reduce the likelihood of a missed or incorrectly classified defect indication, analysis for tube degradation shall:

[15.1] Be completed by two independent analysis teams (designated as primary and secondary). [C.2] ☐

[15.2] Be done separately (without knowledge of the other team's results) and not as a joint effort. [C.2] ☐

[16] Detailed crack profiling / sizing for tube integrity analysis may be performed by a single analyst with an independent review but the independent technical review shall be conducted by a QDA and include review of the analysis set-up, maximum depth, maximum voltage, length, and orientation, when provided. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[17] Automated analysis systems:

[17.1] Application shall be limited to the mode that was qualified (for example, detection only mode, interactive mode, or fully automatic mode). [C.2] ☐

[17.2] When used for degradation analysis, are to be qualified through performance demonstration as follows:

[17.2.1] The initial generic qualification shall be demonstrated on the applicable EPRI Automated Analysis Performance Demonstration Database (AAPDD) which validates detection and sizing/characterization algorithms for each applicable known damage mechanism found in EPRI PWR SG Examination Guidelines, Appendix G, Table G-1. Different algorithms may be required based on variations in AAPDD essential variables (for example, instrument types, drive voltages, tubing sizes, coil excitation frequencies). [C.2] ☐

[17.2.2] The site-specific performance demonstration (SSPD)capability of an automated analysis system shall be demonstrated and documented in accordance with the SSPD practical examination requirements in EPRI PWR SG Examination Guidelines, Appendix G. [C.2] ☐

[17.2.3] SSPD qualification of automatic analysis systems shall be demonstrated independent of human interventions (defined as an analyst operating the automated system deleting, adding, or changing a result). [C.2] ☐

[17.2.4] A process shall be established to maintain control of the qualified algorithm revision(s). [C.21] ☐

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NDE Eddy Current Minimum Requirement Check List

Date _____

1.0 EDDY CURRENT EXAMINATIONS (continued)

[17.2.5] An analyst with experience in the automated system being utilized shall verify the following prior to each inspection: [C.2]

A. Appropriate tube or region coverage exits for detection of degradation. [C.2] ☐

B. Equivalent or conservative algorithm rules exist when compared to the site specific guidelines. [C.2] ☐

C. Damage mechanisms, for which the automated data analysis is being used, are properly screened. [C.2] ☐

[17.2.6] When non-conservative adjustments are made to the qualified algorithms, re-qualification of the adjusted algorithms on the SSPD shall be performed. [C.2] ☐

[17.2.7] When adjustments are made to the qualified algorithms during an outage, an assessment of previously analyzed data from the outage shall be conducted to determine the need for reanalysis. [C.2] ☐

[17.3] Dual automated analysis systems for degradation analysis (i.e., automated analysis system performing both primary and secondary degradation analysis) shall have the following limitations: [C.2]

[17.3.1] Both team shall be independent such that: [C.2]

A. Detection algorithms cannot be the same [C.2] ☐

B. At least one team shall analyze data manually to ensure detection algorithms are not missing degradation. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[17.3.2] Both team may use automated analysis system for sizing / characterization provided: [C.2]

A. The systems are independent systems, [C.2] ☐

B. One of the two team (or resolution team) shall review all the analysis results manually to verify the sizing / characterization algorithms. [C.2] ☐

[18] Discrepancy Resolution Team shall:

[18.1] Represent both primary and secondary analysis teams. [C.2] ☐

[18.2] Review and resolve discrepancies between the results of the two independent analysis teams in accordance with appropriate delineation contained within the site-specific data analysis guidelines. [C.2] ☐

[18.3] Have concurrence from two analysts representing both analysis teams prior the deletion of a reported indication of degradation. [C.2] ☐

[18.4] Consider prior history and /or other techniques before overruling an analysis results. [C.2] ☐

[18.5] Consider feedback from the primary and secondary analysis team and feedback from the IDQA. [C.2] ☐

[19] Independent Qualified Data Analyst shall:

[19.1] Not be a part of the resolution team. [C.2] ☐

[19.2] Review all repairable calls rejected by resolution. [C.2] ☐

[19.3] Randomly sample data to determine if the resolution analysts are resolving calls in a consistent and conservative manner and that calls are being dispositioned properly. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[19.4] Provide feedback to the resolution team. [C.2] ☐

[19.5] Mediate concurrence when resolution analysts cannot agree. [C.2] ☐

[19.6] Monitor data analysis feedback process. [C.2] ☐

[19.7] Randomly sample NDD and NDF calls by production analysts. [C.2] ☐

[20] Data Analyst Feedback Process shall:

[20.1] Contain overall process control requirements / responsibilities. [C.2] ☐

[20.2] Contain missed indication requirements. [C.2] ☐

[20.3] Overall review requirements. [C.2] ☐

[20.4] End of job review requirements. [C.2] ☐

[20.5] Analyst comment resolution process. [C.2] ☐

[20.6] Auto Analysis review requirements. [C.2] ☐

[21] Data management system shall:

[21.1] Be capable of accounting for the completeness of each scheduled examination. [C.2] ☐

[21.2] Have a written close-out procedure or checklist to verify: [C.2]

[21.2.1] Completion of all initial inspection plans. [C.2] ☐

[21.2.2] Completion of all retests and supplemental test plans. [C.2] ☐

[21.2.3] Completion of sample plan expansions as applicable. [C.2] ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[21.2.4] Proper final disposition of all tubes with addressable indication codes. [C.2] ☐

[21.2.5] Required addressing of previous history is complete. [C.2] ☐

[21.2.6] Positive identification (PID) requirement have been met. [C.2] ☐

[21.2.7] Comparison of data management records to analysis source records showing no discrepancies. [C.2] ☐

[21.2.8] Ensure discrepancies discovered during close-out are evaluated against all previously completed steps or re-perform the close-out checklist. [C.2] ☐

[22] After the data close-out process is complete, the contractor lead analyst shall document that all the results are merged and linked back to the appropriate individual raw data files. [C.2] ☐

[23] Contractor shall maintain and provide TVA upon request, probe certificate of conformance from the manufacturer(s) that critical probe manufacturing parameters (that affect data quality) have been verified by the manufacturer. [C.2] ☐

[24] Shall

[24.1] ensure that any deviation to the following industry documents are identified

- EPRI PWR Steam Generator Examination Guidelines ☐
- EPRI Steam Generator Integrity Assessment Guidelines ☐
- EPRI Steam Generator In-Situ Pressure Testing Guidelines ☐

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NDE Eddy Current Minimum Requirement Check List

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1.0 EDDY CURRENT EXAMINATIONS (continued)

[24.2] ensure a technical justification for each deviation includes the basis for the determination that the proposed deviation meets the intent established by the above applicable document, and ☐

[24.3] ensure a knowledgeable second party (not necessarily independent of the utility) review and approval is obtained prior to implementing the deviation, and ☐

[24.4] ensure that executive Site Vice President concurrence is obtained for the above and ☐

[24.5] ensure the written deviation and second opinion is promptly forwarded to NEI and EPRI SGMP for posting to their respective websites. and ☐

[24.6] ensure that a PER is written on the deviations and. ☐

[24.7] ensure management concurrence is EDMS retrievable. ☐

[25] Shall notify the NRC of any approved deviations from "Mandatory" and "Shall" industry guideline elements with a summarization of: ☐

- The guidance being deviated from
- Justification for this deviation, and
- Any actions undertaken in lieu of the guidance

_____ _____
TVA ET Level III or SG Program Specialist — Date

Source Notes
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Requirements Statement	Source Document	Implementing Statement
Issue a surveillance instruction for SG tubing inspections.	NCO 920032002	1
EPRI PWR SG Examination Guidelines contain numerous requirements.	EPRI PWR Steam Generator Examination Guidelines, TR-107569	2
Adequate examinations during scheduled ISI's shall be performed to detect AVB wear indications.	CAQR CHS 89-0044	4
Deleted	Deleted	5
Inspection plans to detect circumferential cracking of SG tubes.	Response to NRC Generic Letter 95-03	6
Inservice Inspection Deficiencies results in severely degraded SG tubes.	IE Notice 94-88	9
RPC examination of TSP intersections is required during inservice inspections	NER 91-1193, NER 90-1016, IE Notice 90-049, IE Notice 91-067, TVA Response W03 911219 001	10
Failure to identify and plug a SG Tube (Secondary and Primary Analyst Discrepancy Resolution).	SQN II-S-93-036, NER930576	11
In a supplemental memo to NRC concerning WBN-TS-99-014 dated January 15, 2002, TVA committed to a specific inspection plan and expansions at dented tube support plate intersections.	NCO-000009-001	C.14
EPRI SG Integrity Assessment Guidelines contains numerous requirements	EPRI SG Integrity Assessment Guidelines, TR-107621	C.17
EPRI SG In-Situ Pressure Test Guidelines contains numerous requirements	EPRI SG In-Situ Pressure Test Guidelines, TR-107620	C.18
WBN SG tube repair by Westinghouse leak limiting Alloy 800 sleeve	WBN-TS-02-16	C.19
NEDP-16 is TVAN Steam Generator Program document with numerous requirements	NEDP-16	C.20

Source Notes (Page 2 of 2)

Requirements Statement	Source Document	Implementing Statement
NEI 97-06 Section 4 contains numerous steam generator program requirements.	NEI-97-06 Rev 2	C.21
TSTF-510 R2 contains numerous requirements	TSTF-510 Rev 2	C.22
WBN Unit 2 will perform visual inspections of the secondary side each outage for detection and/or monitoring of the blowdown pipe cracking	T02 071217 001	C.23