SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION PLAN FOR THE CALLAWAY NUCLEAR POWER PLANT

UNION ELECTRIC COMPANY

REVISION 0

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SECOND INTERVAL

INSERVICE INSPECTION PLAN

CALLAWAY NUCLEAR PLANT

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SECTION 1.0
INTRODUCTION AND PLAN DESCRIPTION

1.1 Overview

1.1.1 This Inservice Inspection Plan outlines the requirements for the inspection of Class 1, 2, and 3 pressure retaining components and their supports at the Callaway Nuclear Power Plant.

1.1.2 This Inservice Inspection Plan will be effective from August 1, 1995, through and including December 18, 2004, which represents the second ten-year interval for the Callaway Nuclear Power Plant.

1.1.3 The key features of this Plan are the Introduction and Plan Description, Relief Requests, and Summary Tables. The details of the Inservice Inspection Program are addressed in other documents that are available at the Callaway Plant. These documents include, but are not limited to, inservice inspection boundary drawings, piping isometric drawings, equipment detail drawings, a component database listing of each weld, valve, support, etc., and documents supporting implementation of the Inservice Inspection Program.

1.2 Basis of Inservice Inspection Plan

1.2.1 This Inservice Inspection Plan was developed in accordance with the requirements delineated in the December 31, 1992, issue of 10 CFR 50.55a and the 1989 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Subsections IWA, IWB, IWC, IWD, and IWF, for Inspection Program B. Accordingly, this Inservice Inspection Plan provides the details necessary for performing the inservice inspection of the Callaway Class 1, 2, and 3 pressure retaining components and supports.

1.2.2 The following ASME Section XI, 1989 Edition Subsections, Articles, or Paragraphs are not included or addressed in this Inservice Inspection Plan.

1.2.2.1 The containment liner and concrete inspection and testing requirements of Subsections IWE and IWL are not included in this Inservice Inspection Plan. The rules of IWE and IWL are currently not required by 10 CFR 50.55a.

1.2.2.2 The pump and valve testing requirements of Subsections IWP and IWV are not included in this Inservice Inspection Plan. The rules of IWP and IWV are addressed in a separate submittal to the NRC staff.

1.2.2.3 The snubber inservice inspection requirements of Paragraphs IWF-5200(a), IWF-5200(b), IWF-5300(a), and IWF-5300(b) are not addressed in this Inservice Inspection Plan. The extent, frequency, and acceptance standards for snubber assembly testing and inspection will be in accordance with Callaway Technical Specification 3/4.7.8.

1.2.2.4 The steam generator tubing examination requirements of Table IWB-2500-1, Examination Category B-Q and the acceptance standards of Paragraph IWB-3521.1 are not addressed in this Inservice Inspection Plan. The extent, frequency, and acceptance standards for steam generator tubing inspection and testing will be in accordance with Callaway Technical Specification 3/4.4.5.

1.2.3 Alternative requirements to ASME Section XI, 1989 Edition, are set forth in Section 4.0 of this Inservice Inspection Plan. Alternative requirements are in accordance with 10 CFR 50.55a and ASME Section XI.

1.2.4 With the exception of examinations that may be deferred until the end of the inspection interval as specified in Table IWB-2500-1, inservice inspections shall be performed in accordance with Inspection Program B as outlined in IWA-2432, IWB-2412, IWC-2412 and IWD-2412 of ASME Section XI. The inspection schedule for the second interval is divided into three periods such that approximately one third of the inspections will be completed every period. Successive inspections shall be in accordance with IWB-2420, IWC-2420, and Code Case N-491 -2420. Deviations to inspection schedules may occur provided compliance with Code requirements is maintained.

1.2.5 The commercial operating license date for the Callaway Nuclear Power Plant was December 19, 1984. As allowed by ASME Section XI, Paragraph IWA-2430, the first inspection interval was extended from December 18, 1994 to July 31, 1995.

1.2.6 The construction code for all ASME components is ASME Section III. The principal edition used for construction of the plant was the 1974 Edition thru Summer 1975 Addenda.

1.3 System Classification

1.3.1 The quality group classification system for radioactive water/steam-containing components important to the safety of water-cooled nuclear power plants is established by NRC Regulatory Guide 1.26, Revision 3, in conjunction with 10 CFR 50.55a. Regulatory Guide 1.26, "Quality Group Classification and Standards", defines the Quality Group Classification System consisting of four Quality Groups, A through D. The definition of Quality Group A is provided by 10 CFR 50.2 under "Reactor Coolant Pressure Boundary". The definitions of Groups B, C, and D are provided by Regulatory Guide 1.26.

1.3.2 Components subject to inservice inspection are shown on the Inservice Inspection Boundary Drawings listed in Section 2.2 of this Inservice Inspection Plan. Pursuant to 10 CFR 50.55a, the inservice inspection requirements of ASME Section XI have been assigned to these components within the constraints of existing plant design.

1.4 Augmented Inservice Inspection Requirements

Augmented inservice inspection requirements are those examinations that are specified by documents other than the ASME Section XI Code. The additional examinations required by the following documents have been added to the Callaway Inservice Inspection Program:

1.4.1 U.S. Nuclear Regulatory Commission Standard Review Plan (SRP), Section 3.6.1, Rev. 1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment" (NUREG-0800). Several piping systems require augmented inspections for protection against postulated piping failures as outlined in SRP Section 3.6.1. Piping systems subject to the augmented inspection criteria of SRP Section 3.6.1 are shown on the Inservice Inspection Boundary Drawings listed in Table 2.2 of this Inservice Inspection Plan. In addition, detailed high energy pipe break isometric drawings of applicable systems are provided in Section 3.6.1 of the Callaway Plant FSAR. A summary of the number of welds subject to the augmented inspection criteria of SRP Section 3.6.1, is provided in Table 3.2 of this Inservice Inspection Plan.

1.4.2 U.S. Nuclear Regulatory Commission Standard Review Plan, Section 6.6, Rev. 1, "Inservice Inspection of Class 2 & 3 Components" (NUREG-0800).

1.4.3 U.S. Nuclear Regulatory Commission Regulatory Guide 1.14, Rev. 1, "Reactor Coolant Pump Flywheel Integrity".

1.4.4 U.S. Nuclear Regulatory Commission Regulatory Guide 1.65, Rev. 0, "Materials and Inspections for Reactor Vessel Closure Studs".

1.4.5 U.S. Nuclear Regulatory Commission Regulatory Guide 1.137, Rev. 0, "Fuel-Oil Systems for Standby Diesel Generators".

1.4.6 U.S. Nuclear Regulatory Commission Regulatory Guide 1.150, Rev. 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations", Regulatory Position C.8 (Alternative Method).

1.4.7 Code of Federal Regulations, Part 10, 50.55a(g)(6)(ii)(A), December 31, 1992, "Augmented Examination of Reactor Vessel".

SECTION 2.0
INSERVICE INSPECTION PROGRAM DRAWINGS

This section provides a listing of the various drawings applicable to the Callaway Inservice Inspection Program.

2.1 Drawing Nomenclature

2.1.1 System Designators

Table 2.1 below lists the two letter System Designator used for each piping system subject to inservice inspection at the Callaway Plant.

TABLE 2.1
SYSTEM DESIGNATORS

System Designator	System
AB	Main Steam
AE	Main Feedwater
AL	Auxiliary Feedwater
BB	Reactor Coolant System including Reactor Pressure Vessel Pressurizer Steam Generators
BG	Chemical and Volume Control
BL	Reactor Make-up Water
BM	Steam Generator Blowdown
BN	Borated Refueling Water Storage
EC	Fuel Pool Cooling and Cleanup
EF	Essential Service Water
EG	Component Cooling Water
EJ	Residual Heat Removal
EM	High Pressure Coolant Injection
EN	Containment Spray
EP	Accumulator Safety Injection
FC	Auxiliary Feedwater Pump Turbine
GF	Miscellaneous Building HVAC
GG	Fuel Building
GK	Control Building HVAC
GL	Auxiliary Building HVAC
GN	Containment Cooling
GP	Containment Integrated Leak Rate Test

System Designator	System
GS	Containment Hydrogen Control
GT	Containment Purge HVAC
HB	Liquid Radwaste
HD	Decontamination
JE	Emergency Fuel Oil
KA	Compressed Air
KB	Breathing Air
KC	Fire Protection
KJ	Standby Diesel Generator
LF	Auxiliary Building Equipment
SJ	Nuclear Sampling

2.1.2 Piping Classifications

2.1.2.1 Piping classifications are designated by a three-letter code. Listed below are the appropriate letter designations for piping subject to inservice inspection. The first letter indicates the Standard Rating Class; the second letter the type of material, and the third letter the Code or standard to which the piping is designed.

2.1.2.2 First Letter - Primary Rating Class

A - Specific pressure & specific temperature
B - Class 2500
C - Class 1500
D - Class 900
E - Class 600
F - Class 400
G - Class 300
H - Class 150

Second Letter - Material

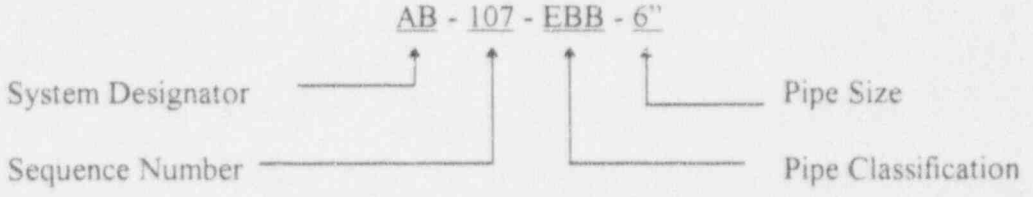
B - Carbon Steel
C - Austenitic Stainless Steel
L - Carbon Steel - impact tested

Third Letter - Applicable Codes

A - ASME B & PV Code, Section III, Class 1
B - ASME B & PV Code, Section III, Class 2
C - ASME B & PV Code, Section III, Class 3
D - Power Piping Code, ANSI B31.1

2.1.3 Line Identification Numbers

The line numbers identified on the drawings listed herein provide useful information about the piping. The lines are identified using the following convention:



Each line, or portion of line, is assigned a system designator, line sequence number, pipe classification, and pipe size. The system designator and line sequence number can be cross referenced to Bechtel Specification MS-2 to determine the line description, design temperature and pressure, and service or normal operating temperature and pressure. The pipe classification can be cross referenced to Bechtel Specification MS-1 to determine the pipe schedule and material specification.

2.2 Inservice Inspection Boundary Drawings

Table 2.2 provides a listing of the Inservice Inspection Boundary Drawings applicable to the second interval at the Callaway Plant. These drawings are Callaway Plant Piping & Instrumentation Drawings that are color coded to identify the Quality Group A, B, and C piping and components subject to inservice inspection. The color code also identifies Non-Exempt, Exempt, and Augmented boundaries. Listed below is a brief description of each type boundary depicted on the boundary drawings.

2.2.1 Non-Exempt Boundaries

The non-exempt boundaries identify piping and components subject to the nondestructive examination, visual examination, and pressure test requirements of ASME Section XI, Subsections IWB, IWC, or IWD. Non-Exempt Quality Group A, B, and C boundaries are color coded red, blue, and green respectively.

2.2.2 Exempt Boundaries

The exempt boundaries identify piping and components that are subject only to the pressure test requirements of ASME Section XI, Articles IWB-5000, IWC-5000, and IWD-5000. As permitted by ASME Section XI, Paragraphs IWB-1220, IWC-1220, IWD-1220, and Code Case N-491, the piping, components, and supports within the exempt boundaries do not require nondestructive (i.e., volumetric or surface) examination or visual (i.e., VT-1 or VT-3) examination. Exempt Quality Group A, B, and C boundaries are color coded orange, light blue, and light green respectively.

2.2.3 Augmented Boundaries

The boundaries for the high energy lines that require augmented examination in accordance with NRC Standard Review Plan, Section 3.6.1 are identified by dashed colored lines on the applicable boundary drawings. In addition, the Diesel Generator Fuel Oil piping that requires augmented pressure testing in accordance with NRC Regulatory Guide 1.137 is identified on the applicable boundary drawings.

TABLE 2.2
INSERVICE INSPECTION BOUNDARY DRAWINGS

Drawing Number	System
ISI-M-22AB01(Q)	Main Steam
ISI-M-22AB02(Q)	Main Steam
ISI-M-22AE02(Q)	Main Feedwater
ISI-M-22AL01(Q)	Auxiliary Feedwater
ISI-M-22BB01(Q)	Reactor Coolant
ISI-M-22BB02(Q)	Reactor Coolant
ISI-M-22BB03(Q)	Reactor Coolant
ISI-M-22BB04(Q)	Reactor Coolant
ISI-M-22BG01(Q)	Chemical and Volume Control
ISI-M-22BG02(Q)	Chemical and Volume Control
ISI-M-22BG03(Q)	Chemical and Volume Control
ISI-M-22BG04(Q)	Chemical and Volume Control
ISI-M-22BG05(Q)	Chemical and Volume Control
ISI-M-22BL01(Q)	Reactor Make-up Water
ISI-M-22BM01(Q)	Steam Generator Blowdown
ISI-M-22BN01(Q)	Borated Refueling Water Storage
ISI-M-22EC01(Q)	Fuel Pool Cooling and Clean-up
ISI-M-22EC02(Q)	Fuel Pool Cooling and Clean-up
ISI-M-2UEF01(Q)	Essential Service Water
ISI-M-22EF01(Q)	Essential Service Water

TABLE 2.2
INSERVICE INSPECTION BOUNDARY DRAWINGS (cont.)

Drawing Number	System
ISI-M-22EF02(Q)	Essential Service Water
ISI-M-22EG01(Q)	Component Cooling Water
ISI-M-22EG02(Q)	Component Cooling Water
ISI-M-22EG03(Q)	Component Cooling Water
ISI-M-22EJ01(Q)	Residual Heat Removal
ISI-M-22EM01(Q)	High Pressure Coolant Injection
ISI-M-22EM02(Q)	High Pressure Coolant Injection
ISI-M-22EN01(Q)	Containment Spray
ISI-M-22EP01(Q)	Accumulator Safety Injection
ISI-M-22FC02(Q)	Auxiliary Feedwater Pump Turbine
ISI-M-22GF01(Q)	Miscellaneous Building HVAC
ISI-M-22GG02(Q)	Fuel Building HVAC
ISI-M-22GK01(Q)	Control Building HVAC
ISI-M-22GK03(Q)	Control Building HVAC
ISI-M-22GL01(Q)	Auxiliary Building HVAC
ISI-M-22GL02(Q)	Auxiliary Building HVAC
ISI-M-22GL03(Q)	Auxiliary Building HVAC
ISI-M-22GN01(Q)	Containment Cooling
ISI-M-22GP01(Q)	Containment Integrated Leak Rate Test
ISI-M-22GS01(Q)	Containment Hydrogen Control
ISI-M-22GT01(Q)	Containment Purge HVAC
ISI-M-22HB01(Q)	Liquid Radwaste
ISI-M-22HD01(Q)	Decontamination
ISI-M-22JE01(Q)	Emergency Fuel Oil
ISI-M-22KA01(Q)	Compressed Air
ISI-M-22KA02(Q)	Compressed Air (Service Air)
ISI-M-22KA05(Q)	Compressed Air
ISI-M-22KB01(Q)	Breathing Air
ISI-M-22KC02(Q)	Fire Protection
ISI-M-22KJ01(Q)	Standby Diesel Generator "A" Cooling Water
ISI-M-22KJ02(Q)	Standby Diesel Generator "A" Intake Exhaust, Fuel Oil and Starting Air
ISI-M-22KJ03(Q)	Standby Diesel Generator "A" Lube Oil
ISI-M-22KJ04(Q)	Standby Diesel Generator "B" Cooling Water
ISI-M-22KJ05(Q)	Standby Diesel Generator "B" Intake Exhaust, Fuel Oil and Starting Air
ISI-M-22KJ06(Q)	Standby Diesel Generator "B" Lube Oil

TABLE 2.2
INSERVICE INSPECTION BOUNDARY DRAWINGS (cont.)

Drawing Number	System
ISI-M-22LF03(Q)	Auxiliary Building Floor and Equipment Drain
ISI-M-22LF09(Q)	Reactor Bldg. & Hot Machine Shop Floor and Equipment Drain
ISI-M-22SJ01(Q)	Nuclear Sampling
ISI-M-22SJ04(Q)	Nuclear Sampling

2.3 Piping Isometric Drawings

Table 2.3 provides a listing of the Piping Isometric Drawings for systems subject to inservice inspection. These drawings identify pipe welds, flange and valve bolted connections, pump and valve internal surfaces, integral attachments, and pipe supports that are within the non-exempt piping boundaries. In addition, system identification, location, room numbers, pipe classification, pipe size, and configuration are identified. Piping and components that are exempt from nondestructive and visual examination in accordance with ASME Section XI, Paragraphs IWB-1220, IWC-1220, and IWD-1220 are not normally depicted on these drawings. If exempt piping or components are shown, it is for information only.

TABLE 2.3
PIPING ISOMETRIC DRAWINGS

Drawing Number	Title
	REFERENCE DRAWINGS
ISI-Ref., Sht. 1	Inservice Inspection Drawing Cross Reference
ISI-Ref., Sht. 2	Inservice Inspection Drawing Nomenclature
ISI-Ref., Sht. 3	Inservice Inspection Drawing Symbols
	MAIN STEAM
AB-01-01, Sht. 1	Loop 1
AB-02-01, Sht. 1	Loop 2
AB-03-01, Sht. 1	Loop 3
AB-04-01, Sht. 1	Loop 4
	MAIN FEEDWATER
AE-01-04, Sht. 1	Loop 1
AE-02-04, Sht. 1	Loop 2
AE-03-05, Sht. 1	Loop 3
AE-04-05, Sht. 1	Loop 4
	AUXILIARY FEEDWATER
AL-01-02, Sht. 1	Motor Driven Auxiliary Feedwater Pump "A" Discharge Piping
AL-02-03, Sht. 1	Motor Driven Auxiliary Feedwater Pump "B" Discharge Piping
AL-03-04, Sht. 1	Turbine Driven Auxiliary Feedwater Pump Discharge Piping
	REACTOR COOLANT
BB-00-01, Sht. 1	Primary Loop-General Layout
BB-01-01, Sht. 1	Loop 1
BB-01-02, Sht. 1	Pressurizer Relief Header
BB-01-04, Sht. 1	Pressurizer Spray Line
BB-01-04, Sht. 2	Pressurizer Spray Line
BB-01-08, Sht. 1	Pump "A" Seal Water Injection Line
BB-02-01, Sht. 1	Loop 2
BB-02-02, Sht. 1	Pressurizer Safety Valve Lines
BB-02-11, Sht. 1	Pump "B" Seal Water Injection Line
BB-03-01, Sht. 1	Loop 3
BB-03-09, Sht. 1	Pump "C" Seal Water Injection Line

TABLE 2.3
PIPING ISOMETRIC DRAWINGS (cont.)

Drawing Number	Title
	REACTOR COOLANT (cont.)
BB-04-01, Sht. 1	Loop 4
BB-04-07, Sht. 1	Pump "D" Seal Water Injection Line
BB-05-01, Sht. 1	Pressurizer Surge Line
BB-06-01, Sht. 1	Loop Drain to Reactor Coolant Drain Tank
	CHEMICAL AND VOLUME CONTROL
BC-01-01, Sht. 1	Normal Charging Line Containment Penetration
BG-01-21, Sht. 1	Normal & Alternate Charging Lines
BG-02-22, Sht. 1	Letdown Line
BG-02-22, Sht. 2	Letdown Line Containment Penetration
BG-03-23, Sht. 1	Excess Letdown Line
BG-04-09, Sht. 1	RCP Seal Water Injection Containment Penetration
BG-05-24, Sht. 1	Auxiliary Spray Line
BG-06-02, Sht. 1	CCP Suction
BG-06-02, Sht. 2	CCP Discharge (HPSI Discharge)
BG-06-10, Sht. 1	CCP Discharge to Seal Water Injection Filters
	STEAM GENERATOR BLOWDOWN
BM-01-01, Sht. 1	Loops "A" & "D"
BM-01-02, Sht. 1	Loops "B" & "C"
	ESSENTIAL SERVICE WATER
EF-01-01, Sht. 1	"A" Train Supply
EF-01-01, Sht. 2	"A" Train Supply
EF-01-02, Sht. 1	"A" Train Supply
EF-01-02, Sht. 2	"A" Train Supply
EF-01-03, Sht. 1	"A" Train Return
EF-01-03, Sht. 2	"A" Train Return
EF-01-07, Sht. 1	"A" Train Return
EF-01-08, Sht. 1	"A" Train Supply
EF-01-11, Sht. 1	"A" and "B" Train Return
EF-02-01, Sht. 1	"B" Train Supply
EF-02-01, Sht. 2	"B" Train Supply
EF-02-01, Sht. 3	"B" Train Return
EF-02-04, Sht. 1	"B" Train Supply
EF-02-05, Sht. 1	"B" Train Return
EF-02-05, Sht. 2	"B" Train Return
EF-02-06, Sht. 1	"B" Train Supply
EF-02-08, Sht. 1	"B" Train Supply
EF-02-08, Sht. 2	"B" Train Return
	COMPONENT COOLING WATER
EG-01-01, Sht. 1	"A" Train CCW Heat Exchanger
EG-01-02, Sht. 1	"A" Train Supply
EG-01-02, Sht. 2	"A" Train Return
EG-02-03, Sht. 1	"B" Train CCW Heat Exchanger

TABLE 2.3
PIPING ISOMETRIC DRAWINGS (cont.)

Drawing Number	Title
	COMPONENT COOLING WATER (Cont.)
EG-02-03, Sht. 2	"B" Train
EG-02-05, Sht. 1	"B" Train Return
EG-02-05, Sht. 2	"B" Train Supply
EG-03-06, Sht. 1	Common Header
EG-03-07, Sht. 1	Common Header
EG-04-01, Sht. 1	RHR Heat Exchanger Supply
EG-04-01, Sht. 2	RHR Heat Exchanger Return
EG-05-06, Sht. 1	Letdown Heat Exchanger Supply
EG-05-06, Sht. 2	Letdown Heat Exchanger Return
EG-06-09, Sht. 1	RCP "B" & "C" Supply
EG-06-09, Sht. 2	RCP Return
	RESIDUAL HEAT REMOVAL
EJ-01-01, Sht. 1	"A" Train RHR Pump Suction
EJ-01-01, Sht. 2	"A" Train RHR Pump Discharge
EJ-01-01, Sht. 3	"A" Train RHR Pump Discharge
EJ-01-01, Sht. 4	"A" Train Pump Discharge to Safety Injection
EJ-01-01, Sht. 5	Return to Refueling Water Storage Tank
EJ-01-04, Sht. 1	"A" Train RHR Pump Suction
EJ-02-02, Sht. 1	"B" Train RHR Pump Suction
EJ-02-02, Sht. 2	"B" Train RHR Pump Discharge
EJ-02-02, Sht. 3	"B" Train RHR Pump Discharge
EJ-02-02, Sht. 4	"B" Train RHR Pump Discharge to Safety Injection
EJ-02-02, Sht. 5	"B" Train RHR Pump Discharge to Safety Injection
EJ-02-04, Sht. 1	"B" Train RHR Pump Suction
EJ-02-04, Sht. 2	"B" Train RHR Discharge to Accumulator Injection
EJ-02-04, Sht. 3	"B" Train RHR Pump Discharge to Safety Injection Loops 2 & 3
	HIGH PRESSURE COOLANT INJECTION
EM-01-01, Sht. 1	Safety Injection Pump "A" Suction
EM-02-01, Sht. 2	Safety Injection Pump "B" Suction
EM-03-05, Sht. 1	Safety Injection Pumps to RHR
EM-04-03, Sht. 1	Safety Injection Pumps to RCS
EM-05-01, Sht. 1	Safety Injection Pump Suction Cross Tie
EM-05-01, Sht. 2	Safety Injection Pump Suction Cross Tie to CVCS
EM-0. 02, Sht. 1	HPSI Discharge to RCS
EM-06-02, Sht. 2	HPSI Discharge to RCS
EM-06-03, Sht. 1	HPSI Discharge to RCS
	CONTAINMENT SPRAY
EN-01-01, Sht. 1	"A" Train Pump Suction
EN-01-01, Sht. 2	"A" Train Pump Discharge
EN-02-02, Sht. 1	"B" Train Pump Suction
EN-02-02, Sht. 2	"B" Train Pump Discharge

TABLE 2.3
PIPING ISOMETRIC DRAWINGS (cont.)

Drawing Number	Title
	ACCUMULATOR SAFETY INJECTION
EP-01-01, Sht. 1	Loop 1
EP-02-02, Sht. 1	Loop 2
EP-03-02, Sht. 1	Loop 3
EP-04-01, Sht. 1	Loop 4
	AUXILIARY TURBINE
FC-01-01, Sht. 1	Aux. Feedwater Pump Turbine Steam Supply Piping
	CONTAINMENT COOLING
GN-01-01, Sht. 1	"A" Train Supply
GN-01-01, Sht. 2	"A" Train Return
GN-01-01, Sht. 3	"A" Train Cooler "A" Supply and Return Headers
GN-01-01, Sht. 4	"A" Train Cooler "C" Supply and Return Headers
GN-01-02, Sht. 1	"A" Train Supply
GN-01-03, Sht. 1	"A" Train Return
GN-02-02, Sht. 1	"B" Train Supply
GN-02-02, Sht. 2	"B" Train Return
GN-02-02, Sht. 3	"B" Train Cooler "B" Supply and Return Headers
GN-02-02, Sht. 4	"B" Train Cooler "D" Supply and Return Headers
GN-02-04, Sht. 1	"B" Train Supply
GN-02-05, Sht. 1	"B" Train Return
	STANDBY DIESEL GENERATOR
KJ-01-01, Sht. 1	Diesel Generator "A" Cooling Water Piping
KJ-02-04, Sht. 1	Diesel Generator "B" Cooling Water Piping

2.4 Equipment Detail Drawings

Table 2.4 provides a listing of Equipment Detail Drawings for equipment welds or components subject to inservice inspection. These drawings display unique identification numbers for equipment welds, integral attachments, or bolted connections that require examination. In addition, weld joint details, component configuration details, weld locations, etc., are depicted.

TABLE 2.4
EQUIPMENT DETAIL DRAWINGS

Drawing Number	Title
ISI-EBB01A, Sht. 1	Steam Generator "A" EBB01A ISI Equipment Welds
ISI-EBB01A, Sht. 2	Steam Generator "A" EBB01A ISI Equipment Welds
ISI-EBB01B, Sht. 1	Steam Generator "B" EBB01B ISI Equipment Welds
ISI-EBB01B, Sht. 2	Steam Generator "B" EBB01B ISI Equipment Welds
ISI-EBB01C, Sht. 1	Steam Generator "C" EBB01C ISI Equipment Welds
ISI-EBB01C, Sht. 2	Steam Generator "C" EBB01C ISI Equipment Welds
ISI-EBB01D, Sht. 1	Steam Generator "D" EBB01D ISI Equipment Welds
ISI-EBB01D, Sht. 2	Steam Generator "D" EBB01D ISI Equipment Welds
ISI-EEJ01A, Sht. 1	RHR Heat Exchanger "A" EEJ01A ISI Equipment Welds
ISI-EEJ01B, Sht. 1	RHR Heat Exchanger "B" EEJ01B ISI Equipment Welds
ISI-RBB01, Sht. 1	Reactor Vessel RBB01 ISI Equipment Welds
ISI-RBB01, Sht. 2	Reactor Vessel RBB01 ISI Equipment Welds
ISI-RBB01, Sht. 3	Reactor Vessel RBB01 ISI Equipment Welds
ISI-RBB01, Sht. 4	Reactor Vessel RBB01 ISI Equipment Welds
ISI-TBB03, Sht. 1	Pressurizer Vessel TBB03 ISI Equipment Welds
ISI-TBB03, Sht. 2	Pressurizer Vessel TBB03 ISI Equipment Welds
ISI-TBB03, Sht. 3	Pressurizer Vessel TBB03 ISI Equipment Welds
ISI-PUMPS, Sht. 1	Miscellaneous Pumps ISI Equipment Welds

2.5 Component/Equipment Support Drawings

Table 2.5 provides a listing of the Component/Equipment Support Drawings for component or equipment supports subject to inservice inspection. These drawings display the configuration of the supports and provide a unique location number for each support assembly that requires visual examination.

TABLE 2.5
COMPONENT/EQUIPMENT SUPPORT DRAWINGS

Drawing Number	Component Description
OP-1459F01	Reactor Vessel (RBB01) Supports
OP-1459F02 OP-1459F04 OP-1459F08 OP-1459F09	Steam Generator "A", "B", "C" & "D" (E8801A, B, C & D) Supports
OP-1459F07	Reactor Coolant Pump "A", "B", "C", & "D" (PBB01A, B, C & D) Supports
OP-1459F10	Pressurizer (TBB03) Supports
5736	RHR Heat Exchanger "A" & "B" (EEJ01A & B) Supports
C-2S1904 C-2S1908	RHR Pump "A" & "B" (PEJ01A & B) Supports
C-2S1904	Containment Spray Pump "A" & "B" (PEN01A & B) Supports
M-721-040	Centrifugal Charging Pump "A" & "B" (PBG05A & B) Supports
OP-300-J49728	Safety Injection Pump "A" & "B" (PEM01A & B) Supports
OP-D-75-569	Chemical & Volume Control Letdown Heat Exchanger (EBG01) Supports
M-072-0001	Component Cooling Water Heat Exchanger "A" & "B" (EEG01A & B) Supports
M-082-012-10	Component Cooling Water Pump "A", "B", "C", & "D" (PEG01A, B, C & D) Supports
M-089-U0012	Essential Service Water Pump "A" & "B" (PEF01A & B) Supports
M-154-U0018	Essential Service Water Self Cleaning Strainer "A" & "B" (FEF02A & B) Supports
M-07-00001-08	Fuel Pool Cooling Heat Exchanger "A" & "B" (EEC01A & B) Supports
B-49HMTA86X16	Motor Driven Auxiliary Feed Water Pump "A" & "B" (PAL01A & B) Supports
M-021-005	Turbine Driven Auxiliary Feed Water Pump (PAL02) Supports
11908662	Diesel Generator Jacket Water Heat Exchanger "A" & "B" (EKJ04A & B) Supports
M-018-00091	Diesel Generator Intercooler Heat Exchanger "A" & "B" (EKJ03A & B) Supports
M-018-00724	Diesel Generator Lube Oil Heat Exchanger "A" & "B" (EKJ06A & B) Supports

SECTION 3.0
INSERVICE INSPECTION SUMMARY TABLES

This section provides a summary listing of all items subject to inservice inspection. Section 3.1 addresses the inservice inspections required by ASME Section XI while Section 3.2 covers augmented inspections.

3.1 ASME Section XI Inservice Inspections

The ASME Section XI Inservice Inspection Summary Table 3.1 provides the following information.

3.1.1 Examination Category

This column lists the examination category as identified in ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, and Code Case N-491 -2500-1. Only those examination categories applicable to the Callaway Plant are identified.

3.1.2 Item Number and Description of Components Examined

These columns list the item number and description as defined in ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, and Code Case N-491 -2500-1. Only those item numbers applicable to the Callaway Plant are identified.

3.1.3 Number of Components

This column lists the population of components potentially subject to examination. The number of components actually examined during the inspection interval will be based upon the Code requirements for the subject item number (e.g., 25% of Examination Category B-J, Item Number B9.11 components will be examined during the inspection interval).

3.1.4 Examination Method

The column lists the examination method(s) required by ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, and Code Case N-491 -2500-1.

3.1.5 Relief Request Number

This column provides a listing of applicable relief requests. If a relief request number is identified, see the corresponding relief request in Section 4.4.

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
B-A Pressure Retaining Welds in Reactor Vessel	B1.11	Circumferential Shell Welds	2	Volumetric	
	B1.12	Longitudinal Shell Welds	9	Volumetric	
	B1.21	Circumferential Head Welds	3	Volumetric	
	B1.22	Meridional Head Welds	8	Volumetric	
	B1.30	Shell-to-Flange Weld	1	Volumetric	
	B1.40	Head-to-Flange Weld	1	Volumetric & Surface	
B-B Pressure Retaining Welds in Vessels Other Than Reactor Vessels	B2.11	Pressurizer Circumferential Shell-to-Head Welds	2	Volumetric	
	B2.12	Pressurizer Longitudinal Shell-to-Head Welds	2	Volumetric	
	B2.40	Steam Generator Tube Sheet-to-Head Weld	4	Volumetric	
B-D Full Penetration Welds of Nozzles in Vessels	B3.90	Reactor Vessel Nozzle-to-Vessel Welds	8	Volumetric	ISI-05
	B3.100	Reactor Vessel Nozzle Inside Radius Section	8	Volumetric	ISI-05
	B3.110	Pressurizer Nozzle-to-Vessel Welds	6	Volumetric	
	B3.120	Pressurizer Nozzle Inside Radius Section	6	Volumetric	
	B3.140	Steam Generator (Primary Side) Inside Radius Section	8	Volumetric	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
B-E Pressure Retaining Partial Penetration Welds in Vessels	B4.11	Partial Penetration Vessel Nozzle Welds	1	Visual, VT-2	
	B4.12	Partial Penetration Control Rod Drive Nozzle Welds	78	Visual, VT-2	
	B4.13	Partial Penetration Instrumentation Nozzle Welds	58	Visual, VT-2	
	B4.20	Partial Penetration Pressurizer Heater Penetration Welds	78	Visual, VT-2	
B-F Pressure Retaining Dissimilar Metal Welds	B5.10	Reactor Vessel Dissimilar Metal Nozzle-to-Safe End Butt Welds NPS 4 or Larger	8	Volumetric & Surface	ISI-05
	B5.40	Pressurizer Dissimilar Metal Nozzle-to-Safe End Butt Welds NPS 4 or Larger	6	Volumetric & Surface	
B-G-1 Pressure Retaining Bolting Greater Than 2 in. in Diameter	B6.10	Reactor Vessel Closure Head Nuts	54	Visual, VT-1	
	B6.20	Reactor Vessel Closure Studs, in Place	54	Volumetric	
	B6.30	Reactor Vessel Closure Studs, when Removed	54	Volumetric & Surface	
	B6.40	Threads in Reactor Vessel Flange	54	Volumetric	
	B6.50	Reactor Vessel Closure Washers, Bushings	54	Visual, VT-1	
	B6.180	Bolts & Studs in Pumps	4	Volumetric	
	B6.190	Flange Surface, When Connection Disassembled, in Pumps	4	Visual, VT-1	
	B6.200	Nuts, Bushings, & Washers in Pumps	4	Visual, VT-1	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
B-G-2 Pressure Retaining Bolting, 2 in & Less in Diameter	B7.20	Bolts, Studs, & Nuts in the Pressurizer	1	Visual, VT-1	
	B7.30	Bolts, Studs, & Nuts in Steam Generators	8	Visual, VT-1	
	B7.50	Bolts, Studs, & Nuts in Piping	11	Visual, VT-1	
	B7.70	Bolts, Studs, & Nuts in Valves	25	Visual, VT-1	
B-J Pressure Retaining Welds in Piping	B9.11	Circumferential Welds in Piping NPS 4 or Larger	315	Volumetric & Surface	
	B9.12	Longitudinal Welds in Piping NPS 4 or Larger	N/A	Volumetric & Surface	ISI-04
	B9.21	Circumferential Welds in Piping Less than NPS 4	309	Surface	
	B9.31	Branch Pipe Connection Welds NPS 4 or Larger	13	Volumetric & Surface	
	B9.32	Branch Pipe Connection Welds Less than NPS 4	37	Surface	
	B9.40	Socket Welds	11	Surface	
B-K[1] Integral Attachments for Class 1 Vessels, Piping, Pumps & Valves	B10.10[1]	Integrally Welded Attachments to Vessels	5	Surface	ISI-06

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
B-L-2 Pump Casings	B12.20	Pump Casings	4	Visual, VT-3	
B-M-2 Valve Bodies	B12.50	Valve Bodies, Exceeding NPS 4	25	Visual, VT-3	
B-N-1 Interior of Reactor Vessel	B13.10	Vessel Interior	1	Visual, VT-3	
B-N-2 Integrally Welded Core Support Structures & Interior Attachments to Reactor Vessels	B13.60	Interior Attachments beyond Beltline Region in Reactor Vessel	6	Visual, VT-3	
B-N-3 Removable Core Support Structures	B13.70	Core Support Structure in Reactor Vessel	1	Visual, VT-3	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
B-O Pressure Retaining Welds in Control Rod Housings	B14.10	Welds in CRD Housing	32	Volumetric or Surface	
B-P All Pressure Retaining Components (Class 1)	B15.10	RPV - System Leakage Test	1	Visual, VT-2	ISI-07
	B15.11	RPV - System Hydrostatic Test	1	Visual, VT-2	ISI-07
	B15.20	Pressurizer - System Leakage Test	1	Visual, VT-2	ISI-07
	B15.21	Pressurizer - System Hydrostatic Test	1	Visual, VT-2	ISI-07
	B15.30	Steam Generator - System Leakage Test	4	Visual, VT-2	ISI-07
	B15.31	Steam Generator - System Hydrostatic Test	4	Visual, VT-2	ISI-07
	B15.50	Piping - System Leakage Test	See Note 6	Visual, VT-2	ISI-07
	B15.51	Piping - System Hydrostatic Test	See Note 6	Visual, VT-2	ISI-07
	B15.60	Pumps - System Leakage Test	4	Visual, VT-2	ISI-07
	B15.61	Pumps - System Hydrostatic Test	4	Visual, VT-2	ISI-07
	B15.70	Valves - System Leakage Test	See Note 6	Visual, VT-2	ISI-07
	B15.71	Valves - System Hydrostatic Test	See Note 6	Visual, VT-2	ISI-07
B-Q Steam Generator Tubing	B16.20	Steam Generator Tubing in U-Tube Design	4	Volumetric[2]	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
C-A Pressure Retaining Welds in Pressure Vessels	C1.10	Shell Circumferential Welds	16	Volumetric	
	C1.20	Head Circumferential Welds	4	Volumetric	
	C1.30	Tubesheet-to-Shell Welds	4	Volumetric	
C-B Pressure Retaining Nozzle Welds in Vessels	C2.21	Nozzle-to-Shell (or Head) Weld without Reinforcing Plate in Vessels > 1/2" Nominal Thickness	8	Volumetric & Surface	
	C2.22	Nozzle Inside Radius Section	8	Volumetric	
	C2.33	Nozzle-to-Shell (or Head) Welds when Inside of Vessel is Inaccessible, for Vessels > 1/2" Nominal Thickness with Reinforcing Plates	4	Visual, VT-2	
C-C[1] Integral Attachments for Class 2 Vessels, Piping, Pumps and Valves	C3.10[1]	Integrally Welded Attachments to Pressure Vessels	2	Surface	ISI-06
	C3.20[1]	Integrally Welded Attachments to Piping	107	Surface	ISI-06
	C3.30[1]	Integrally Welded Attachments to Pumps	20	Surface	ISI-06

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Requests Number
C-D Pressure Retaining Bolting Greater Than 2 in. in Diameter	C4.40	Bolts and Studs in Valves	4	Volumetric	
C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping	C5.11	Circumferential Welds in Austenitic Stainless Steel or High Alloy Piping ≥ 3/8" Nominal Wall Thickness for Piping > NPS 4	717	Volumetric & Surface	
	C5.12	Longitudinal Welds in Austenitic Stainless Steel or High Allow Piping ≥ 3/8" Nominal Wall Thickness for Piping > NPS 4	N/A	Volumetric & Surface	ISI-04
	C5.21	Circumferential Welds in Austenitic Stainless Steel or High Alloy Piping ≥ 1/5" in. Nominal Wall Thickness for Piping ≥ NPS 2 and ≤ NPS 4	177	Volumetric & Surface	
	C5.30	Socket Welds	20	Surface	
	C5.41	Circumferential Welds in Pipe Branch Connections of Branch Piping ≥ NPS 2	14	Surface	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
C-F-2 Pressure Retaining Welds in Carbon or Low Alloy Steel Piping	C5.51	Circumferential Welds in Carbon or Low Alloy Steel Piping ≥ 3/8" Nominal Wall Thickness for Piping > NPS 4	303	Volumetric & Surface	
	C5.52	Longitudinal Welds in Carbon or Low Alloy Steel Piping ≥ 3/8" Nominal Wall Thickness for Piping > NPS 4	N/A	Volumetric & Surface	ISI-04
	C5.81	Circumferential Welds in Carbon or Low Alloy Steel Pipe Branch Connections of Branch Piping ≥ NPS 2	2	Surface	
C-G Pressure Retaining Welds in Pumps and Valves	C6.10	Pump Casing Welds	10	Surface	
C-H All Pressure Retaining Components (Class 2)	C7.10	Pressure Vessels - System Pressure Test	See Note 6	Visual, VT-2	ISI-07
	C7.20	Pressure Vessels - System Hydrostatic Test[5]	See Note 6	Visual, VT-2	ISI-07
	C7.30	Piping - System Pressure Test	See Note 6	Visual, VT-2	ISI-07, 09
	C7.40	Piping - System Hydrostatic Test[5]	See Note 6	Visual, VT-2	ISI-07, 09
	C7.50	Pumps - System Pressure Test	See Note 6	Visual, VT-2	ISI-07
	C7.60	Pumps - System Hydrostatic Test[5]	See Note 6	Visual, VT-2	ISI-07
	C7.70	Valves - System Pressure Test	See Note 6	Visual, VT-2	ISI-07
	C7.80	Valves - System Hydrostatic Test[5]	See Note 6	Visual, VT-2	ISI-07

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
D-A[1] Integral Attachments for Class 3 Vessels, Piping, Pumps & Valves	D1.10[1]	Integrally Welded Attachments to Pressure Vessels	42	Visual, VT-1	ISI-06
	D1.20[1]	Integrally Welded Attachments to Piping	165	Visual, VT-1	ISI-06
	D1.30[1]	Integrally Welded Attachments to Pumps	4	Visual, VT-1	ISI-06
D-A Systems in Support of Reactor Shutdown Function	D1.10	Class 3 Pressure Retaining Components			
		- System Pressure Test	See Note 6	Visual, VT-2	
		- System Hydrostatic Test	See Note 6	Visual, VT-2	
D-B Systems in Support of Emergency Core Cooling, Containment Heat Removal, Atmosphere Cleanup, and Reactor Residual Heat Removal	D2.10	Class 3 Pressure Retaining Components			
		- System Pressure Test	See Note 6	Visual, VT-2	
		- System Hydrostatic Test	See Note 6	Visual, VT-2	

TABLE 3.1
ASME SECTION XI
INSERVICE INSPECTION SUMMARY TABLE (cont.)

Examination Category	Item Number	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
D-C Systems in Support of Residual Heat Removal from Spent Fuel Storage Pool	D3.10	Class 3 Pressure Retaining Components - System Pressure Test - System Hydrostatic Test	 See Note 6 See Note 6	 Visual, VT-2 Visual, VT-2	
F-A[3,4] Supports	F1.10[3]	Class 1 Piping Supports	297	Visual, VT-3	
	F1.20[3]	Class 2 Piping Supports	367	Visual, VT-3	
	F1.30[3]	Class 3 Piping Supports	657	Visual, VT-3	
	F1.40[3]	Supports Other Than Piping Supports (Class 1, 2, and 3)	160	Visual, VT-3	ISI-03

Notes:

1. Reference Callaway Relief Request ISI-06 for a description of the Examination Categories and Item Numbers used for the inservice inspection of integrally welded attachments.
2. The extent, frequency and acceptance standards for the examination of Steam Generator tubing will be in accordance with Callaway Technical Specification 3/4.4.5.
3. Reference Code Case N-491 for a description of the Examination Category and Item Numbers used for the inservice inspection of supports.
4. Snubber assemblies will be tested and inspected in accordance with Callaway Technical Specification 3/4.7.8. Integral and non-integral attachments for snubbers, including lugs, bolting, pins, and clamps, shall be examined in accordance with the requirements of Code Case N-491.
5. The system hydrostatic pressure test will be performed to the alternate rules for 10-year hydrostatic pressure testing delineated in Code Case N-498.
6. Pressure retaining components (e.g., pressure vessels, pumps, valves, piping, etc.) that are subject to a system pressure or hydrostatic test are identified on Inservice Inspection Boundary Drawings. Reference Section 2.2 of this Plan for details pertaining to these drawings.

3.2 Augmented Inservice Inspections

The Augmented Inservice Inspection Summary Table 3.2 provides the following information:

3.2.1 Implementing Document

This column lists the basis document for the augmented inservice examination.

3.2.2 Description of Components Examined

This column provides a description of the components subject to augmented inservice inspection.

3.2.3 Number of Components

This column lists the population of components potentially subject to augmented examination. The number of components actually examined during the inspection interval will be in accordance with the requirements of the implementing document.

3.2.4 Examination Method

This column lists the examination method required by the implementing document.

3.2.5 Relief Request Number

This column provides a listing of applicable relief requests. If a relief request number is identified, see the corresponding relief request in Section 4.4.

TABLE 3.2
AUGMENTED INSERVICE INSPECTION
SUMMARY TABLE

Implementing Document	Description of Components Examined	Number of Components	Examination Method	Relief Request Number
NRC Standard Review Plan Sections 3.6.1 and 6.6	Circumferential, Longitudinal and Branch Welds in Piping 2" NPS and Greater	376	Volumetric	
	Circumferential Welds in Piping 1 1/2" NPS	16	Surface	ISI-02
	Socket Welds in Piping 1 1/2" NPS and Greater	105	Surface	
Regulatory Guide 1.14	RCP Flywheel in Areas of Higher Stress Concentration at the Bore and Keyway	4	Volumetric	
	RCP Flywheel at Exposed Surfaces	4	Surface	
	RCP Flywheel, Entire Volume	4	Volumetric	
Regulatory Guide 1.65	Reactor Vessel Closure Studs, When Removed	54	Surface	
Regulatory Guide 1.137	Fuel System for Standby Diesel Generators	2	Visual, VT-2	
Regulatory Guide 1.150	Reactor Vessel Welds	32	Volumetric	

SECTION 4.0
ALTERNATIVE REQUIREMENTS TO ASME SECTION XI, 1989 EDITION

This section lists the alternative requirements to ASME Section XI, 1989 Edition, being adopted for the Second Interval Inservice Inspection Program at the Callaway Plant. The alternative requirements presented are in accordance with ASME Section XI and 10 CFR 50.55a, as applicable.

4.1 Adoption of Code Cases

This Section addresses the adoption of Code Cases during the Second Inservice Inspection Interval at the Callaway Plant. Code Cases adopted for Inservice Inspection use during the Second Interval will be listed in Table 4.1 of this Inservice Inspection Plan. Code Cases for Repair/Replacement activities are not addressed in this Inservice Inspection Plan. In all cases, the use and adoption of Code Cases will be in accordance with ASME Section XI, IWA-2440 and 10 CFR 50.55a. The methodology for adopting Code Cases is divided into the four categories clarified below.

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

Code Cases that are listed for generic use in Regulatory Guide 1.147, Revision 10, and later, will be adopted for use during the Second Inservice Inspection Interval by listing them in Table 4.1 of this Inservice Inspection Plan. All conditions or limitations delineated in Regulatory Guide 1.147 for a particular Code Case will apply.

4.1.2 Adoption of Code Cases Not Listed for Generic Use in Regulatory Guide 1.147

Adoption of Code Cases that have been approved by the Board of Nuclear Codes and Standards, but that have not been listed for generic use in Regulatory Guide 1.147, may be submitted in the form of a Relief Request in accordance with 10 CFR 50.55a(a)(3). Alternatively, Code Cases may be adopted for use by special permission from the NRC as specified in Callaway FSAR, Appendix 3A.

4.1.3 Adoption of Code Cases Listed for Generic Use in Regulatory Guide 1.147 But Subsequently Annulled by ASME Section XI

Under certain circumstances, it may be necessary to adopt a Code Case that has been listed for generic use in Regulatory Guide 1.147, but subsequently annulled by ASME Section XI. Therefore, Union Electric Company endorses all revisions of Regulatory Guide 1.147 from Revision 10 up to and including the most recent revision. Endorsement of these revisions of Regulatory Guide 1.147 does not commit the Callaway Plant to all Code Cases listed therein, but rather allows for selection of a previously accepted Code Case. The purpose of this endorsement is to identify all Code Cases that could potentially be incorporated into the Inservice Inspection Plan in accordance with IWA-2441.

4.1.4 Adoption of Code Cases Issued Subsequent to Filing this Inservice Inspection Plan

Code Cases issued by ASME Section XI subsequent to filing this Inservice Inspection Plan will be proposed for use in amendments to this Plan in accordance with ASME Section XI, IWA-2441(d).

TABLE 4.1
LIST OF ADOPTED CODE CASES

CODE CASE NO.	TITLE	REG. GUIDE 1.147 REVISION	DATE ADOPTED
N-460	Alternative Examination Coverage for Class 1 and Class 2 Welds	10	8/1/95
N-461	Alternative Rules for Piping Calibration Block Thickness	10	8/1/95
N-489	Alternative Rules for Level III NDE Qualification Examinations	10	8/1/95
N-491	Alternative Rules for Examination of Class 1, 2, 3 and MC Component Supports of Light Water Cooled Power Plants	10	8/1/95
N-498	Alternative Rules for 10-Year Hydrostatic Pressure Testing of Class 1 and 2 Systems	10	8/1/95

4.2 Use of Subsequent Editions of ASME Section XI

In accordance with 10 CFR 50.55a(g)(3)(v), components (including supports) may meet the requirements set forth in subsequent editions of Codes and Addenda, or portions thereof, which are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed therein. This Section of the Inservice Inspection Plan provides for alternative requirements from approved subsequent Code editions that may be adopted during the Second Inservice Inspection Interval. This Inservice Inspection Plan will be amended for adoption of subsequent Code rules.

4.3 Inservice Inspection Relief Request Index

This section provides a summary listing and revision status of all Relief Requests related to inservice inspections at the Callaway Plant.

TABLE 4.3
INSERVICE INSPECTION
RELIEF REQUEST INDEX

Relief Request	Page	Rev.	Date	Topic
ISI-01	4.4-2	0	10/12/94	Exemption from Appendix VII Ultrasonic Examination Personnel Qualification Requirements
ISI-02	4.4-4	0	10/12/94	Exemption of Circumferential Welds in 1 1/2" NPS Piping from Volumetric Examination Requirements of NRC Standard Review Plan, Section 3.6.1
ISI-03	4.4-6	0	10/12/94	Limited Examination of Reactor Vessel Supports
ISI-04	4.4-9	0	10/12/94	Alternate Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping
ISI-05	4.4-10	0	10/12/94	Alternate Rules for Deferral of Inspections on Nozzle-to-Vessel Welds, Inside Radius Sections and Nozzle-to-Safe End Welds of the Reactor Vessel
ISI-06	4.4-15	0	10/12/94	Alternate Rules for the Selection and Examination of Class 1, 2 and 3 Integrally Welded Attachments
ISI-07	4.4-21	0	10/12/94	Alternate Rules for Insulation Removal During IWB-5000 and IWC-5000 Pressure Tests at Bolted Connections in Systems Borated for the Purpose of Controlling Reactivity

TABLE 4.3
INSERVICE INSPECTION
RELIEF REQUEST INDEX
(cont.)

Relief Request	Page	Rev.	Date	Topic
ISI-08	4.4-24	0	10/12/94	Alternate Rules for Corrective Measures if Leakage Occurs at a Bolted Connection
ISI-09	4.4-26	0	10/12/94	Alternate Provisions for Pressure Testing Code Class 2 Piping and Valves at Containment Penetrations Where the Balance of the System is Outside the Scope of Section XI

4.4 Inservice Inspection Relief Requests

4.4.1 This section contains Relief Requests written in accordance with 10 CFR 50.55a(g)(5) when specific ASME Section XI requirements for inservice inspection are considered impractical. The enclosed Relief Requests are subject to change throughout the inspection interval. If examination requirements are determined to be impractical during the course of the interval, additional or modified relief requests shall be submitted in accordance with 10 CFR 50.55a(g)(5).

4.4.2 Exceptions to Code required examinations may also be authorized by NRR, as allowed by 10 CFR 50.55a (a)(3), provided that design, fabrication, installation, testing and inspection performed in compliance with Codes and Section XI requirements would result in hardship without a compensating increase in the level of quality and safety, or provided that the proposed alternative examination will assure an acceptable level of quality and safety. Specific exceptions may also be documented in the form of Relief Requests and included in this Section, as applicable.

4.4.3 Relief Requests for incomplete examinations shall be submitted in accordance with 10 CFR 50.55a(g)(5)(iv) throughout the interval as limitations are identified. Due to ongoing changes in nondestructive examination procedures, techniques and requirements, the Union Electric Company considers that submitting Relief Requests for incomplete examinations when they are evaluated will provide a more accurate representation of the limitations.

RELIEF REQUEST NUMBER: ISI-01

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COMPONENT IDENTIFICATION

Code Classes:	1 and 2
References:	IWA-2311(b) and Appendix VII
Examination Categories:	B-A, B-B, B-D, B-F, B-G-1, B-J, C-A, C-B, C-D, C-F-1, C-F-2
Item Numbers:	B1.11, B1.12, B1.21, B1.22, B1.30, B1.40, B2.11, B2.12, B2.40, B3.90, B3.100, B3.110, B3.120, B3.140, B5.10, B5.40, B5.70, B6.20, B6.30, B6.40, B6.180, B9.11, B9.12, B9.31 C1.10, C1.20, C1.30, C2.21, C2.22, C4.40, C5.11, C5.12, C5.21, C5.51, C5.52
Description:	Exemption from Appendix VII Ultrasonic Examination Personnel Qualification Requirements
Component Numbers:	All Class 1 and 2 components requiring ultrasonic examination

CODE REQUIREMENT

Paragraph IWA-2311(b) specifies that the training, qualification, and certification of ultrasonic examination personnel shall also comply with the requirements of Appendix VII.

Appendix VII provides requirements for the employer's written practice, qualification of ultrasonic examiners, qualification records, and the minimum content of initial training courses for the ultrasonic examination method in addition to those required in SNT-TC-1A.

BASIS FOR RELIEF

Union Electric requests relief from implementation of Appendix VII until the performance demonstration requirements of Appendix VIII are fully implemented. Implementation of Appendix VII prior to full implementation of Appendix VIII is considered impractical and without a compensating increase in quality and safety.

Appendix VII was first introduced in the 1988 Addenda to Section XI. This Appendix represents a dramatic change from previous Code editions and current industry practices in the requirements for qualification of ultrasonic examination personnel. New training programs must be developed and taught by trained instructors, employer's written practices must be completely rewritten, examination question banks must be developed, flaw specimens containing actual or simulated flaws must be acquired, and performance demonstrations (practical examinations) must be completed.

RELIEF REQUEST NUMBER: ISI-01
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Implementation of Appendix VII will require a substantial industry effort. Although work is progressing towards compliance with Appendix VII, full implementation has not yet been achieved. Since Appendix VII provides for use of specimens prepared for ultrasonic performance demonstrations per Appendix VIII, many NDE vendors are developing these two programs concurrently in order to avoid duplicated effort. Though currently not required, the nuclear industry anticipates that the Appendix VIII performance demonstration requirements will be mandated by a backfit ruling in the Federal Register. In anticipation of this ruling, the Performance Demonstration Initiative (PDI) Committee is currently leading an industry wide effort to implement Appendix VIII. The tentative completion dates for pipe weld performance demonstrations and reactor vessel performance demonstrations are January of 1996, and January of 1997, respectively.

The Union Electric Company intends to fully implement Appendix VII when the performance demonstrations of Appendix VIII are mandated by a backfit ruling in the Federal Register.

PROPOSED ALTERNATE PROVISIONS

The Callaway Plant shall utilize ultrasonic examination personnel qualified in accordance with the requirements of IWA-2300, except for IWA-2311(b). The additional Appendix VII training, qualification, and certification requirements referenced in IWA-2311(b) shall be fully implemented when the performance demonstrations of Appendix VIII are mandated by a ruling in the Federal Register.

RELIEF REQUEST NUMBER: ISI-02

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COMPONENT IDENTIFICATION

Code Class: 2
References: NRC Standard Review Plan, Section 3.6.1 (NUREG-0800)
Examination Category: N/A
Item Number: N/A
Description: Exemption of Circumferential Welds in 1 1/2" NPS Piping from the Volumetric Examination Requirements of NRC Standard Review Plan, Section 3.6.1

Component Numbers:

RCP "A" Seal Water Injection Line Welds	
2-BG-09-FW387	2" x 1 1/2" Reducer to 1 1/2" Pipe
2-BG-09-FW386	1 1/2" Pipe to Valve
2-BG-09-FW385	1 1/2" Pipe to Valve
2-BG-09-FW384	2" x 1 1/2" Reducer to 1 1/2" Pipe
RCP "B" Seal Water Injection Line Welds	
2-BG-09-FW432	2" x 1 1/2" Reducer to 1 1/2" Pipe
2-BG-09-FW431	1 1/2" Pipe to Valve
2-BG-09-FW430	1 1/2" Pipe to Valve
2-BG-09-FW429	2" x 1 1/2" Reducer to 1 1/2" Pipe
RCP "C" Seal Water Injection Line Welds	
2-BG-09-FW417	2" x 1 1/2" Reducer to 1 1/2" Pipe
2-BG-09-FW416	1 1/2" Pipe to Valve
2-BG-09-FW415	1 1/2" Pipe to Valve
2-BG-09-FW414	2" x 1 1/2" Reducer to 1 1/2" Pipe
RCP "D" Seal Water Injection Line Welds	
2-BG-09-FW402	2" x 1 1/2" Reducer to 1 1/2" Pipe
2-BG-09-FW401	1 1/2" Pipe to Valve
2-BG-09-FW400	1 1/2" Pipe to Valve
2-BG-09-FW399	2" x 1 1/2" Reducer to 1 1/2" Pipe

AUGMENTED REQUIREMENT

Standard Review Plan, Section 3.6.1 requires that circumferential welds in piping exceeding 1" NPS be subject to volumetric examination.

RELIEF REQUEST NUMBER: ISI-02
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BASIS FOR RELIEF

The sixteen welds listed above are all within portions of the Reactor Coolant Pump Seal Water Injection Lines which are schedule 160, 1 1/2" NPS. A combination of the small pipe diameter and pipe thickness cause the volumetric examinations to yield meaningless results.

PROPOSED ALTERNATE EXAMINATIONS

As an alternative to the requirements of NRC Standard Review Plan, Section 3.6.1, liquid penetrant examinations shall be performed on all sixteen of the subject welds. In addition, a visual VT-2 examination shall be performed on these welds as specified in ASME Section XI.

RELIEF REQUEST NUMBER: ISI-03

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COMPONENT IDENTIFICATION

Code Class:	1
References:	Code Case N-491, Table -2500-1
Examination Category:	F-A
Item Number:	F1.40
Description:	Limited Examination of Reactor Vessel Supports
Component Numbers:	2-RBB01-01, 2-RBB01-02, 2-RBB01-03, and 2-RBB01-04

CODE REQUIREMENT

ASME Section XI, Code Case N-491, Table -2500-1 requires that 100% of Class 1 supports, other than piping, be subject to a visual VT-3 examination once every inspection interval.

BASIS FOR RELIEF

The Callaway Reactor Vessel is supported by two cold leg nozzles and two hot leg nozzles. There is a support assembly at each of these nozzles that consists of a nozzle weld build up, shoe plate, air cooled box, and steel support structure embedded in the primary shield wall. Figure ISI-03 depicts these support assemblies. As shown in the figure, only the nozzle weld build up and shoe plate are completely accessible for a visual VT-3 examination. The majority of the air cooled box and the entire steel support structure are located beneath a steel walk plate and only the top of the air cooled box is directly accessible. An additional 20 to 30 percent of the air cooled box and a very small percentage of the steel support structure would be made accessible if the steel walk plate and insulation were removed.

The Reactor Vessel supports are located in a confined space below the refueling pool permanent seal ring. The area can only be accessed through four seal ring hatches. In addition to difficult access, the radiation in the area is between 1.5 to 2.0 man-rem per hour. It is estimated that the removal and re-installation of the walk plate and insulation in this confined space, combined with the visual VT-3 examination, would result in an exposure of approximately 36 man-rem. Removal of the walk plate and insulation under these conditions to increase the examination of the air cooled box by approximately 20 to 30 percent and a very small percentage of the steel support structure is considered impractical without a commensurate increase in quality or safety. Based on this, relief is requested from the visual VT-3 examination of the air cooled box and steel support structure that is obstructed by the walk plate and insulation.

RELIEF REQUEST NUMBER: ISI-03
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PROPOSED ALTERNATE EXAMINATION

A limited visual VT-3 examination, with the walk plate and insulation installed, shall be performed on the accessible NF portions of the Reactor Vessel support assemblies to satisfy the requirements of Code Case N-491, Table -2500-1, Item No. F1.40. If conditions are discovered during this limited VT-3 examination that do not meet the acceptance standards of N-491, -3400, the walk plate or insulation will, if necessary, be removed to meet the evaluation requirements of N-491, -3112.2 or -3112.3.

RELIEF REQUEST NUMBER: ISI-03

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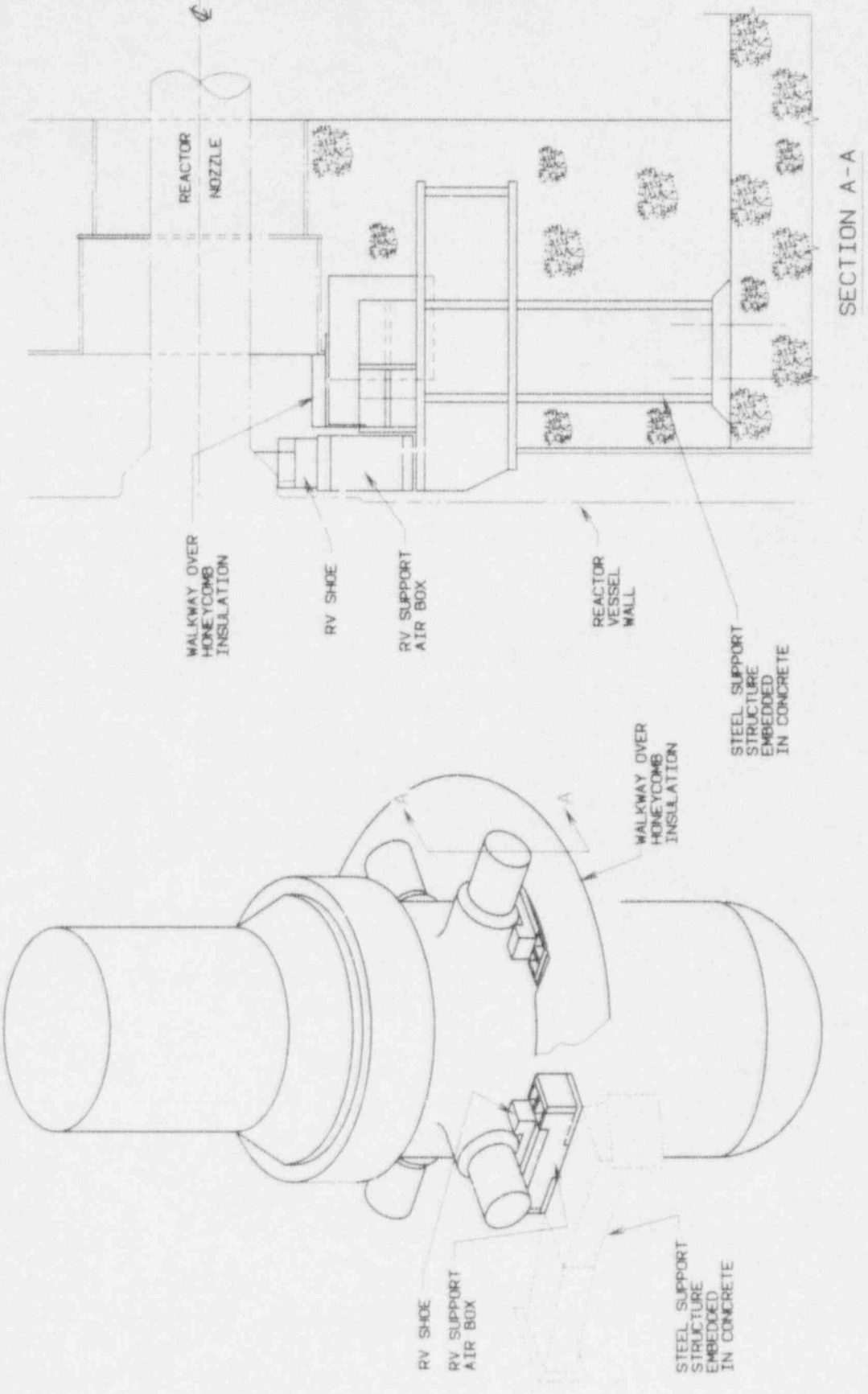

RELIEF REQUEST NUMBER: ISI-04

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COMPONENT IDENTIFICATION

Code Classes:	1 and 2
References:	Table IWB-2500-1, Table IWC-2500-1
Examination Categories:	B-J, C-F-1, C-F-2
Item Numbers:	B9.12, B9.22, C5.12, C5.22, C5.42, C5.52, C5.62, and C5.82
Description:	Alternate Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping
Component Numbers:	All Class 1 and 2 Longitudinal Piping Welds Subject to Surface or Volumetric Examination

CODE REQUIREMENTS

Class 1 Piping:
Table IWB-2500-1 requires the performance of surface and volumetric examinations on Item No. B9.12 longitudinal welds, and a surface examination on Item No. B9.22 longitudinal welds. The examination includes at least a pipe diameter length, but not more than 12 in., of each longitudinal weld intersecting the circumferential welds required to be examined by Examination Categories B-F and B-J.

Class 2 Piping:
Table IWC-2500-1 requires the performance of surface and volumetric examination on Item Nos. C5.12, C5.22, C5.52 and C5.62, and a surface examination on Item Nos. C5.42 and C5.82. The examination includes a length of 2.5t at the intersecting circumferential welds required to be examined by Examination Categories C-F-1 and C-F-2.

BASIS FOR RELIEF

Based on the reasons stated below, the performance of surface and volumetric examination on longitudinal piping welds has a negligible compensating effect on the quality or safety of Class 1 and 2 piping. In addition, there is little, if any, technical benefit associated with the performance of these examinations, but they result in a substantial man-rem exposure and cost.

1) Throughout the nuclear industry, there has been no evidence of rejectable service induced flaws being attributed to longitudinal piping welds.

2) During the first inservice inspection interval at the Callaway Plant, no inservice flaws have been detected in longitudinal piping welds.

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3) There are distinct differences between the processes used in the manufacturing of longitudinal and circumferential welds which enhance the integrity of longitudinal welds. First, longitudinal welds are typically manufactured under controlled shop conditions whereas circumferential welds are produced in the field under less ideal conditions. Secondly, longitudinal welds usually undergo heat treatment in the shop which improves their material properties and relieves the residual stresses created by welding. Finally, shop manufacturing inspections can be performed under more favorable conditions which further increase the confidence level of the longitudinal weld quality.

4) During field installation of piping, the ends of the longitudinal welds may be affected during welding of the intersecting circumferential field welds. This small area falls within the circumferential weld inspection boundaries. Therefore, the ends of the longitudinal welds will still be subject to examination.

5) From an industry-wide standpoint, there has been no evidence of longitudinal weld defects compromising safety at nuclear generating facilities.

6) No significant loading conditions or known material degradation mechanisms have become evident to date which specifically relate to longitudinal seam welds in nuclear plant piping.

7) There is a significant accumulation of man-rem exposure and cost associated with the inspection of Class 1 and 2 longitudinal piping welds.

8) The alternative examinations proposed below provide an acceptable level of quality and safety without causing undue hardship or difficulties.

PROPOSED ALTERNATE EXAMINATION

Surface and volumetric examinations shall be performed, as applicable, on the length of the longitudinal weld that is normally examined during inspection for the intersecting circumferential weld(s). The volumetric examination at the intersection of circumferential and longitudinal welds will include both transverse and parallel scans within the length of the longitudinal weld that falls within the circumferential weld examination boundary.

RELIEF REQUEST NUMBER: ISI-05
(Page 1 of 4)

COMPONENT IDENTIFICATION

Code Class:	1
References:	IWB-2500, Table IWB-2500-1
Examination Categories:	B-D, B-F
Item Numbers:	B3.90, B3.100, B5.10
Description:	Alternate Rules for the Deferral of Inspections on Nozzle-to-Vessel Welds, Inside Radius Sections and Nozzle-to-Safe End Welds of the Reactor Vessel
Component Numbers:	Nozzle-to-Vessel Welds (Item No. B3.90) 2-RV-105-121-A 2-RV-105-121-B 2-RV-105-121-C 2-RV-105-121-D 2-RV-107-121-A 2-RV-107-121-B 2-RV-107-121-C 2-RV-107-121-D Inner Radius Sections (Item No. B3.100) 2-RV-105-121-A-IR 2-RV-105-121-B-IR 2-RV-105-121-C-IR 2-RV-105-121-D-IR 2-RV-107-121-A-IR 2-RV-107-121-B-IR 2-RV-107-121-C-IR 2-RV-107-121-D-IR Nozzle-to-Safe End Welds (Item No. B5.10) 2-RV-301-121-A 2-RV-301-121-B 2-RV-301-121-C 2-RV-301-121-D 2-RV-302-121-A 2-RV-302-121-B 2-RV-302-121-C 2-RV-302-121-D

RELIEF REQUEST NUMBER: ISI-05
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CODE REQUIREMENT

ASME Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-D requires volumetric examination of reactor vessel nozzle-to-vessel welds and their inside radius sections once each ten-year inspection interval. Note (2) of Examination Category B-D states that at least 25 percent, but not more than 50 percent (credited), of the reactor vessel nozzles shall be examined by the end of the first inspection period, and the remainder by the end of the inspection interval.

Table IWB-2500-1, Examination Category B-F, Note (1) states that the reactor vessel nozzle-to-safe end weld examinations may be performed coincident with the vessel nozzle examinations required by Examination Category B-D.

BASIS FOR RELIEF

Relief is requested to defer 100 percent of the reactor vessel nozzle-to-vessel weld examinations, the nozzle inside radius section examinations, and the nozzle-to-safe end weld examinations to the end of Callaway's second ten-year inspection interval.

Union Electric believes that performing 25 percent to 50 percent of the reactor vessel nozzle examinations in the first period of the second inspection interval is impractical for the following reasons:

1) The vendor cost alone (not including site training, plant support, or potential critical path time) to perform these examinations with automated tooling in the first inspection period is currently estimated at $250,000. The cost to perform these same examinations at the end of the second inspection interval concurrent with the reactor vessel ten-year examination is estimated at only $25,000. The major expense associated with the first inspection period examinations is the added equipment and personnel mobilization costs and equipment assembly and disassembly costs.

2) Approximately three to four man-rem exposure is currently expended for automated equipment assembly and disassembly in the reactor cavity area. In addition to exposure, there are approximately two to three cubic feet of solid radwaste generated during performance of automated examinations in the reactor vessel. Under current Code rules, this personnel exposure and radwaste generation would be incurred twice; once for the nozzle first inspection period examinations and again for the reactor vessel examinations at the end of the inspection interval. Performing the nozzle examinations concurrent with the reactor vessel ten-year examinations will save approximately three to four man-rem exposure and two to three cubic feet of solid radwaste.

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For reasons listed below, Union Electric believes that deferral of 100 percent of the reactor vessel nozzle examinations to the end of the second inspection interval will provide an acceptable level of safety and quality.

1) All four of Callaway's Reactor Vessel hot leg nozzle-to-vessel welds, hot leg nozzle inside radius sections, and hot leg nozzle-to-safe end welds were examined in 1987 during the first period of the first ten-year inspection interval. No indications or relevant conditions were discovered that required successive inspections in accordance with Paragraph IWB-2420(b). Furthermore, no inservice repairs or replacements by welding have ever been performed on any of the nozzle-to-vessel welds, nozzle inside radius sections, or nozzle-to-safe end welds at Callaway.

2) From an industry perspective, there are two reasons why deferral of Callaway's nozzle examinations to the end of the second inspection interval will not decrease the level of quality and safety. First, PWR reactor vessels similar to Callaway's have been operating for over 20 years with no recorded inservice induced flaws or potential degradation mechanisms. Since each PWR reactor vessel in operation is representative of the operating conditions throughout the industry, continued inspection of these vessels ensures that any potential degradation mechanism will be detected. Second, given the present large population of PWR reactor vessels in operation, the examination of nozzles within the industry during any ten-year interval is evenly distributed. This distribution is essentially equivalent, regardless of whether or not a percentage of the nozzle examinations are performed in the first inspection period or performed concurrent with the reactor vessel ten-year examinations at the end of the inspection interval.

3) The pressurizer and primary steam generator nozzle-to-vessel welds, inside radius sections, and nozzle-to-safe end welds are similar in configuration, material properties, weld process parameters, and operate in the same reactor coolant system environment as the reactor vessel nozzles. Due to this similarity, distribution of the pressurizer and steam generator nozzle examinations in accordance with Examination Category B-D and Examination Category B-F will further substantiate the integrity of the reactor vessel nozzles until they are examined at or near the end of the second inservice inspection interval.

4) Performing all the automated reactor vessel examinations during a single refueling outage improves consistency of the examinations by utilizing the same equipment, personnel, and procedures. Moreover, this improves the reliability and reproducibility of the examinations.

RELIEF REQUEST NUMBER: ISI-05
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PROPOSED ALTERNATE EXAMINATION

Union Electric shall complete the required nozzle-to-vessel weld examinations, the nozzle inside radius section examinations, and the nozzle-to-safe end weld examinations concurrent with the reactor vessel ten-year examinations at or near the end of the second ten-year inservice inspection interval. In addition, the reactor vessel hot leg nozzle inside surfaces, including the inside radius sections and nozzle-to-safe end weld areas, that are made accessible with the upper internals removed and lower internals (core barrel) installed, shall be visually VT-3 examined once each inspection period of the second ten-year inservice inspection interval.

RELIEF REQUEST NUMBER: ISI-06

(Page 1 of 6)

COMPONENT IDENTIFICATION

Code Classes:	1, 2 and 3
References:	Table IWB-2500-1, Table IWC-2500-1, Table IWD-2500-1
Examination Categories:	B-H, B-K-1, C-C, D-A, D-B, D-C
Item Numbers:	B8.10, B8.20, B8.30, B8.40, B10.10, B10.20, B10.30, C3.10, C3.20, C3.30, C3.40, D1.20, D1.30, D1.40, D1.50, D1.60, D2.20, D2.30, D2.40, D2.50, D2.60
Description:	Alternate Rules for the Selection and Examination of Class 1, 2 and 3 Integrally Welded Attachments
Component Numbers:	All Class 1, 2 and 3 Integral Attachments Subject to Inservice Inspection

CODE REQUIREMENTS

Class 1 Attachments:
Table IWB-2500-1, Examination Categories B-H and B-K-1 require the performance of surface or volumetric examinations, as applicable, on integral attachments with a design thickness of 5/8" or greater.

Class 2 Attachments:
Table IWC-2500-1, Examination Category C-C requires the performance of a surface examination on integral attachments with a design thickness of 3/4" or greater.

Class 3 Attachments:
Table IWD-2500-1, Examination Categories D-A, D-B and D-C require the performance of a visual VT-3 inspection on integral attachments.

For complete details on ASME Section XI Code examination requirements, see Tables IWB-2500-1, IWC-2500-1 and IWD-2500-1.

RELIEF REQUEST NUMBER: ISI-06
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BASIS FOR RELIEF

Relief is being requested to allow the use of alternate requirements for the examination of Class 1, 2 and 3 integral attachments. The basis for this request is as follows:

1) During the first inservice inspection interval at the Callaway Plant, no inservice flaws were detected in integrally welded attachments which would affect safety or compromise the integrity of the plant.

2) Within the nuclear industry, failures in integral attachments have been very rare and have not affected plant safety. When failures or inservice defects are found in integral attachments, they are usually associated with a support which has been damaged during operation. Therefore, flawed or broken integral attachments are typically detected during the investigation of damaged supports rather than during Code scheduled inservice inspections. One purpose of the alternative examination proposed below is to focus the inspection of integral attachments on those instances where the associated supports show signs of damage. This will increase the likelihood of locating damaged integral attachments.

3) There is a significant amount of man-rem exposure and cost associated with the scheduled inspection of Class 1, 2, and 3 integral attachments.

4) Unlike ASME Section XI, the alternate examinations proposed below do not impose a minimum thickness requirement for the inspection of an integral attachment. Therefore, a greater population of integral attachments will be available for inspection because inspections will not be limited to thick attachments. This provision improves the quality and safety level established by these examinations.

5) The alternate examinations proposed below provide an acceptable level of quality and safety without causing undue hardship or difficulties.

PROPOSED ALTERNATE EXAMINATION

The following rules will be used to select and examine integrally welded attachments.

1) This Relief Request is limited to Examination Categories B-H, B-K-1, C-C, D-A, D-B and D-C.

2) Class 1, 2 and 3 component supports shall be selected for examination in accordance with Code Case N-491.

3) Except for the selection of component supports for examination, all references to Section XI within this Relief Request are from the 1989 Edition.

RELIEF REQUEST NUMBER: ISI-06
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Scope

These requirements apply to examination and sample selection of Class 1, 2, and 3 integrally welded attachments of vessels, piping, pumps, and valves listed in Table 2500-1 as follows:

a) Table 2500-1, Examination Category B-K shall be used for Class 1 integrally welded attachments in Examination Categories B-H and B-K-1 of IWB.

b) Table 2500-1, Examination Category C-C shall be used for Class 2 integrally welded attachments in Examination Category C-C of IWC.

c) Table 2500-1, Examination Category D-A shall be used for Class 3 integrally welded attachments in Examination Categories D-A, D-B, and D-C of IWD.

Exemption Criteria

a) The exemption criteria provided in IWB-1220, IWC-1220, and IWD-1220 may be applied to Class 1, 2, and 3 components respectively, with integrally welded attachments, required to be examined in accordance with Table 2500-1.

b) Class 1, 2, and 3 integrally welded attachment examinations performed as a result of component support deformation cannot be credited under the requirements of IWB-2411 or IWB-2412, IWC-2411 or IWC-2412, and IWD-2411 or IWD-2412, respectively.

Inspection Schedule

Class 1, 2, or 3 integrally welded attachments selected for examination by sample selection criteria in accordance with Table 2500-1, Examination Categories B-K, C-C and D-A, shall meet the requirements of IWB-2411 or IWB-2412, IWC-2411 or IWC-2412, or IWD-2411 or IWD-2412, respectively.

Additional and Successive Examinations

a) Class 1, 2, and 3 additional and successive examination requirements of IWB-2430 and IWB-2420 for Class 1, IWC-2430 and IWC-2420 for Class 2 and 3 as applicable, shall be applied to integrally welded attachments whose examinations reveal flaws or relevant conditions that exceed the acceptance standards of IWB-3000, IWC-3000, and IWD-3000, respectively.

When integrally welded attachments are examined as a result of identified component support deformation and the results of these examinations exceed the applicable acceptance standards listed above, additional or successive examinations shall be performed when determined necessary based on an evaluation.

RELIEF REQUEST NUMBER: ISI-06
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TABLE 2500-1
EXAMINATION CATEGORIES

EXAMINATION CATEGORY B-K, INTEGRAL ATTACHMENTS FOR CLASS 1 VESSELS, PIPING, PUMPS, AND VALVES						
Item No.	**Parts Examined[1]**	**Examination Requirements/Fig. No.**	**Examination Method**	**Acceptance Standard**	**Extent of Examination[2,3]**	**Frequency of Examination[6]**
B10.10	**Pressure Vessels** Integrally Welded Attachments	IWB-2500-13, -14, and -15	Surface[7]	IWB-3516	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[4]
B10.20	**Piping** Integrally Welded Attachments	IWB-2500-13, -14, and -15	Surface	IWB-3516	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]
B10.30	**Pumps** Integrally Welded Attachments	IWB-2500-13, -14, and -15	Surface	IWB-3516	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]
B10.40	**Valves** Integrally Welded Attachments	IWB-2500-13, -14, and -15	Surface	IWB-3516	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]

NOTES:
(1) Examination is limited to those integrally welded attachments that meet the following conditions:
(a) the attachment is on the outside surface of the pressure retaining component;
(b) the attachment provides component support as defined in NF-1110; and
(c) the attachment weld joins the attachment either directly to the surface of the component or to an integrally cast or forged attachment to the component.
(2) The extent of the examination includes essentially 100% of the length of the attachment weld at each attachment subject to examination.
(3) Selected samples of integrally welded attachments shall be examined each inspection interval.
(4) In the case of multiple vessels of similar design, function and service, only one integrally welded attachment of only one of the multiple vessels shall be selected for examination.
(5) For piping, pumps, and valves, a sample of 10% of the welded attachments associated with the component supports selected for examination under Code Case N-491 shall be examined.
(6) Examination is 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.
(7) For the configuration shown in Fig. IWB-2500-14, a volumetric examination of volume A-B-C-D from side (B-C) of the circumferential welds may be performed in lieu of the surface examination of surfaces A-D and B-C.

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TABLE 2500-1 (cont'd)
EXAMINATION CATEGORIES

EXAMINATION CATEGORY C-C, INTEGRAL ATTACHMENTS FOR CLASS 2 VESSELS, PIPING, PUMPS, AND VALVES						
Item No.	**Parts Examined[1]**	**Examination Requirements/Fig. No.**	**Examination Method**	**Acceptance Standard**	**Extent of Examination[2,3]**	**Frequency of Examination[6]**
C3.10	**Pressure Vessels** Integrally Welded Attachments	IWC-2500-5	Surface	IWB-3512	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[4]
C3.20	**Piping** Integrally Welded Attachments	IWC-2500-5	Surface	IWB-3512	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]
C3.30	**Pumps** Integrally Welded Attachments	IWC-2500-5	Surface	IWB-3512	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]
C3.40	**Valves** Integrally Welded Attachments	IWC-2500-5	Surface	IWB-3512	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval[5]

NOTES:

(1) Examination is limited to those integrally welded attachments that meet the following conditions:
- (a) the attachment is on the outside surface of the pressure retaining component;
- (b) the attachment provides component support as defined in NF-1110; and
- (c) the attachment weld joins the attachment either directly to the surface of the component or to an integrally cast or forged attachment to the component.

(2) The extent of the examination includes essentially 100% of the length of the attachment weld at each attachment subject to examination.

(3) Selected samples of integrally welded attachments shall be examined each inspection interval.

(4) In the case of multiple vessels of similar design, function and service, only one integrally welded attachment of only one of the multiple vessels shall be selected for examination.

(5) For piping, pumps, and valves, a sample of 10% of the welded attachments associated with the component supports selected for examination under Code Case N-491 shall be examined.

(6) Examination is 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.

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TABLE 2500-1 (cont'd)
EXAMINATION CATEGORIES

EXAMINATION CATEGORY D-A, INTEGRAL ATTACHMENTS FOR CLASS 3 VESSELS, PIPING, PUMPS, AND VALVES						
Item No.	**Parts Examined[1]**	**Examination Requirements/Fig. No.**	**Examination Method**	**Acceptance Standard**	**Extent of Examination[2,3]**	**Frequency of Examination[3,4]**
D1.10	**Pressure Vessels** Integrally Welded Attachments	IWD-2500-1	Visual, VT-1	IWD-3000	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval
D1.20	**Piping** Integrally Welded Attachments	IWD-2500-1	Visual, VT-1	IWD-3000	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval
D1.30	**Pumps** Integrally Welded Attachments	IWD-2500-1	Visual, VT-1	IWD-3000	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval
D1.40	**Valves** Integrally Welded Attachments	IWD-2500-1	Visual, VT-1	IWD-3000	100% of required areas of each welded attachment	Each identified occurrence and each inspection interval

NOTES:

(1) Examination is limited to those integrally welded attachments that meet the following conditions:
- (a) the attachment is on the outside surface of the pressure retaining component;
- (b) the attachment provides component support as defined in NF-1110; and
- (c) the attachment weld joins the attachment either directly to the surface of the component or to an integrally cast or forged attachment to the component.

(2) The extent of the examination includes essentially 100% of the length of the attachment weld at each attachment subject to examination.

(3) Selected samples of integrally welded attachments shall be examined each inspection interval. All integrally welded attachments selected for examination shall be subject to corrosion, such as the integrally welded attachments of the Service Water or Emergency Service Water systems. In the case of multiple vessels of similar design, function and service, the integrally welded attachments of only one of the multiple vessels shall be selected for examination. For integrally welded attachments of piping, pumps, and valves, a 10% sample shall be selected for examination. This percentage sample shall be proportional to the total number of nonexempt integrally welded attachments connected to the piping, pumps, and valves, located within each system subject to these examinations.

(4) Examination is 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.

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COMPONENT IDENTIFICATION

Code Classes:	1 and 2
References:	IWA-5242(a)
Examination Categories:	B-P and C-H
Item Numbers:	All Item Numbers Listed Under Examination Categories B-P and C-H
Description:	Alternate Rules for Insulation Removal During IWB-5000 and IWC-5000 Pressure Tests at Bolted Connections in Systems Borated for the Purpose of Controlling Reactivity
Component Numbers:	Bolted Connections in Systems Borated for the Purpose of Controlling Reactivity

CODE REQUIREMENT

ASME Section XI, 1989 Edition, Paragraph IWA-5242(a) states, "For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for visual examination VT-2."

BASIS FOR RELIEF

Relief is requested from the requirement to remove insulation for visual VT-2 examination of bolted connections during a system pressure test on systems borated for the purpose of controlling reactivity. Union Electric believes that removal of insulation at bolted connections in borated systems solely for a visual VT-2 examination is impractical for the reasons listed below:

1) Code Class 1 and 2 systems borated for the purpose of controlling reactivity are extensive and large systems covering many areas and elevations. Scaffolding will be required to access many of the bolted connections. In addition, many of the bolted connections are located in difficult to access areas and in medium to high radiation areas. Insulation removal combined with scaffolding requirements will increase the financial cost, personnel exposure, and generation of radwaste associated with performance of visual VT-2 examinations.

2) The visual VT-2 examination of Class 1 systems, primarily the Reactor Coolant System (RCS) piping and components, is performed between plant mode 3 and 2 ascending. As required by IWB-5221, the RCS is at a normal operating pressure of 2235 psig. Between modes 3 and 2 ascending, the temperature is approximately 557 ^{o}F. Performance of a visual VT-2 examination, installation of insulation, and disassembly of scaffolding at bolted connections under these operating conditions is a personnel safety hazard. The visual VT-2 examination is a critical path activity and normally has a duration of six to eight hours. Since the majority of Class 1 piping is inside the containment building bio-shield wall, insulation installation and disassembly of scaffolding will add to the outage duration. Critical path cost is currently estimated at $207,000 per day.

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Union Electric believes that the established Callaway programs described below in addition to the alternative examination proposed below, provide an acceptable level of safety and quality for bolted connections in systems borated for the purpose of controlling reactivity.

1) In response to NRC Generic Letter 88-05, Union Electric has established a program for Engineering to inspect all boric acid leaks discovered in the containment building and to evaluate the impact of those leaks on carbon steel or low alloy steel components. All evidence of leaks, including boric acid crystals or residue, is inspected and evaluated regardless of whether the leak was discovered at power or during an outage. Issues such as the following are considered in the inspection and evaluation: 1) evidence of corrosion or metal degradation, 2) effect the leak may have on the pressure boundary, 3) possibility of boric acid traveling along the inside of insulation on piping, and 4) possibility of dripping or spraying on other components. Based on this evaluation, Engineering initiates appropriate corrective actions to prevent reoccurrence of the leak and to repair, if necessary, any degraded materials or components.

2) In addition to the nondestructive examinations required by ASME Section XI, Union Electric has committed to the bolting examination requirements of NRC Bulletin 82-02. In accordance with this Bulletin, at least two nondestructive examination techniques (e.g., ultrasonic, liquid penetrant, magnetic particle, or visual VT-1) are performed on bolted connections of the following components: Steam Generator primary manways, Pressurizer primary manway, Pressurizer safety valves, and a total of 22 Reactor Coolant System isolation valves that are greater than 6" NPS. As a minimum, two nondestructive examination techniques are used whenever the bolted connection of one of the subject components is disassembled for maintenance or other inspection. These additional examinations ensure that degradation mechanisms such as Stress Corrosion Cracking or corrosion do not go undetected in bolted connections critical to reactor safety.

3) The only carbon steel components at the Callaway Plant that are in systems borated for the purpose of controlling reactivity are clad with stainless steel. Specifically, these clad components are the Reactor Vessel, Steam Generators (primary side), and Pressurizer. All other piping and components in borated systems that are within inservice inspection boundaries are fabricated of stainless steel. There is substantial information, such as EPRI NP-5679, attesting to the resistance of stainless steels to boric acid corrosion. To ensure that degradation mechanisms in stainless steels are mitigated, Union Electric maintains a program at the Callaway Plant that controls materials (insulation, thread lubricant, boron, etc.) that may come in contact with safety related components, including bolting. This program ensures that impurities are not present in concentrations that would promote development of Stress Corrosion Cracking in stainless steel bolted connections.

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PROPOSED ALTERNATE EXAMINATION

Bolted connections in systems borated for the purpose of controlling reactivity shall receive a visual VT-2 examination during the system pressure tests of IWB-5000 and IWC-5000 with the insulation installed. If evidence of leakage is detected, either by discovery of active leakage or evidence of boric acid crystals, the insulation shall be removed and the bolted connection shall be re-examined and, if necessary, evaluated in accordance with the corrective measures of Subarticle IWA-5250.

If insulation is removed for planned maintenance, repair, or other inspection at a bolted connection in a system borated for the purpose of controlling reactivity, a visual VT-2 examination shall be performed on the bolted connection prior to disassembly and, if evidence of leakage is discovered, evaluated in accordance with the corrective measures of Subarticle IWA-5250.

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COMPONENT IDENTIFICATION

Code Classes:	1, 2, and 3
Reference:	IWA-5250(a)(2)
Examination Category:	N/A
Item Number:	N/A
Description:	Alternate Rules for Corrective Measures if Leakage Occurs at a Bolted Connection
Component Numbers:	Class 1, 2, and 3 Pressure-Retaining Bolted Connections

CODE REQUIREMENT

ASME Section XI, 1989 Edition, Subparagraph IWA-5250(a)(2) states, "if leakage occurs at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100."

BASIS FOR RELIEF

A leaking environment at a bolted connection may be a significant variable in the degradation mechanism of bolted connections. However, leakage is not the only variable, and in some cases may not be the degradation mechanism. Other variables to be considered are: bolting materials, leaking medium, duration of the leak, and orientation of the leak (not all the bolts may be wetted). These variables are important to consider before disassembling a bolted connection for a visual VT-3 examination. Removal of bolting at a mechanical connection may not be the most prudent decision and may cause undue hardship without a compensating increase in the level of quality or safety. Union Electric proposes an alternative to the requirements of IWA-5250(a)(2) that will provide an equivalent level of quality and safety at Class 1, 2, and 3 bolted connections.

PROPOSED ALTERNATE EXAMINATION

Leakage discovered at a bolted connection by visual VT-2 examination during system pressure test will be evaluated to determine the susceptibility of the bolting to corrosion and potential future failure. The evaluation will, as a minimum, consider the following variables:

1) Location of leakage
2) History of leakage
3) Bolted connection materials
4) Visual evidence of corrosion with the connection assembled
5) Corrosiveness of the process fluid
6) History and studies of similar bolted material in a similar environment
7) Other components in the vicinity that may be degraded due to the leakage

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When evaluation of the variables above indicates the need for further evaluation, the bolt closest to the source of leakage will be removed, receive a visual VT-3 examination, and be evaluated in accordance with IWA-3100(a). If the leakage was identified with the bolted connection in service and evaluation supports continued service, this VT-3 examination may be deferred to the next outage of sufficient duration. When the removed bolt has evidence of rejectable degradation, all remaining bolts shall be removed and subsequently receive a visual VT-3 examination and evaluated in accordance with IWA-3100(a).

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COMPONENT IDENTIFICATION

Code Class: 2

Reference: Table IWC-2500-1

Examination Category: C-H

Item Numbers: C7.30, C7.40, C7.70, and C7.80

Description: Alternate Provisions for Pressure Testing Code Class 2 Piping and Valves at Containment Penetrations Where the Balance of the System is Outside the Scope of Section XI

Component Numbers:

Line Number	Penetration	Description
BB-103-HCB-1"	P-62	Pressurizer relief tank gas line
BL-028-HCB-3"	P-25	Reactor water storage tank to RCP standpipes
BM-053-HBB-3"	P-78	Steam Generator drain
EC-067-HCB-6"	P-53	Fuel pool cooling return
EC-072-HCB-6"	P-54	Refueling pool to fuel pool cooling pump suction
EC-081-HCB-3"	P-55	Refueling pool to fuel pool skimmer pump
EM-071-BCB-3/4"	P-92	SIS pump test line return to Reactor water storage tank
GP-003-HBB-1"	P-51	ILRT test connection lines
GP-005-HBB-1"	P-51	ILRT test connection lines
GS-025-HBB-6"	P-65	Hydrogen purge subsystem to ESF filters
GT-007-HBB-36"	V-160	Containment shutdown purge
GT-004-HBB-36"	V-161	Containment shutdown purge
GT-029-HBB-18"	V-161	Containment shutdown purge
GT-034-HBB-18"	V-160	Containment shutdown purge
GT-033-HBB-18"	V-160	Containment shutdown purge
GT-030-HBB-18"	V-161	Containment shutdown purge
HB-015-HCB-3"	P-26	From reactor coolant drain tank heat exchanger
HB-025-HBB-3/4"	P-44	Reactor coolant drain tank to waste gas compressor
HD-015-HBB-2"	P-43	Auxiliary steam for reactor vessel head decontamination

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Component Numbers (Cont.): Line Number	Penetration	Description
KA-244-HCB-1 1/2"	P-30	Compressed air
KA-259-HCB-1 1/2"	P-30	Compressed air
KA-051-HBB-5"	P-63	Service air
KA-261-HBB-1"	P-63	Reactor building service air
KA-732-HBB-1"	N/A	Personnel hatch penetration test lines
KA-733-HBB-1"	N/A	Personnel hatch penetration test lines
KB-001-HCB-2"	P-98	Breathing air
KC-560-HBB-4"	P-67	Fire protection
LF-842-HCB-6"	P-32	Containment building floor drain header
SJ-002-BCB-1"	P-69	Nuclear sampling from pressurizer vapor space
SJ-003-ECB-1"	P-95	Nuclear sampling from accumulator tanks
SJ-001-BCB-1"	P-93	Loop 1 hot leg liquid sample to PASS
SJ-029-BCB-1"	P-93	Loop 1 hot leg liquid sample to PASS
SJ-021-BCB-1"	P-64	Loop 3 hot leg & pressurizer liquid sample to PASS
SJ-024-BCB-1"	P-57	PASS to reactor coolant drain tank
SJ-025-BCB-1"	P-58	PASS to reactor coolant drain tank

CODE REQUIREMENT

ASME Section XI, Table IWC-2500-1, Examination Category C-H, requires the performance of a visual VT-2 examination during a system pressure test on Code Class 2 pressure retaining components. Note 7 of this table states, "The pressure boundary includes only those portions of the system required to operate or support the safety system function up to and including the first normally closed valve (including a safety or relief valve) or valve capable of automatic closure when the safety function is required."

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BASIS FOR RELIEF

Union Electric Company requests relief from the requirement to perform a pressure test in accordance with ASME Section XI, Table IWC-2500-1, Examination Category C-H on the Code Class 2 lines listed above. Based on the discussion below, these pressure tests are considered redundant and without a compensating increase in the level of quality or safety.

The lines listed above are portions of non-safety related piping systems that penetrate the primary reactor containment. At each containment penetration, the process pipe is classified Code Class 2 and provided with isolation valves that are either locked shut during normal operation, capable of automatic closure, or capable of remote closure to support the containment safety function. The piping and valves are considered part of the primary reactor containment and upgraded to Code Class 2 at the penetration only to support the primary reactor containment safety function. Except for this, the lines listed above provide no safety function.

The primary reactor containment integrity, including all containment penetrations, is periodically verified by performing leakage tests in accordance with a 10 CFR 50, Appendix J. Each of the Code Class 2 lines listed above and their associated isolation valves are tested during an Appendix J, Type A, B or C leakage test at a pressure not less than 48.1 psig. The Type A leakage test is performed three times in a ten year interval and the Type B and C leakage tests are performed at intervals not greater than 24 months. Performance of these Appendix J leak tests will verify the integrity of the subject Code Class 2 lines at each respective penetration. The performance of ASME Section XI, Examination Category C-H pressure tests on these same lines will provide little, if any, additional verification of primary reactor containment integrity. Based on this, the performance of Examination Category C-H pressure tests on these lines is considered by Union Electric to be unnecessary and provides a negligible increase in the level of quality or safety.

PROPOSED ALTERNATE PROVISIONS

Union Electric shall perform 10 CFR 50, Appendix J leakage tests on the primary reactor containment penetration lines listed above, and on their associated valves, in accordance with Callaway Technical Specification 3/4.6.

SECTION 5.0
NRC CORRESPONDENCE

This Section contains all NRC correspondence related to the Second Interval Inservice Inspection Plan at the Callaway Plant. The purpose of this Section is to incorporate NRC correspondence directly into the Inspection Plan so that related requests for information, submittals, decisions and approvals are permanently documented.