Omaha Public Power District

Fort Calhoun Station, Unit 1

Inservice Inspection Program Plan for the 1983-1993 Interval

PROGRAM TABLE OF CONTENTS

ABBREVIATIONS

A - addition

AD - air diaphragm operator

AP - air piston

C - change

CS - cold shutdown

EX - exceptions

F - full stroke exercise

FAI - fail as is

FC - fail closed

FO - fail open

FTB - fail to bypass

HO - hand operator

HP - hydraulic piston

LC - locked closed

MO - motor operator

NA - not applicable

NC - normally closed

NO - normally opened

P - partial stroke exercise

RO - refueling outage

RSU - reactor startup

SO - solenoid operator

Q - quarterly

V - variable position

INTRODUCTION

This report defines the Inservice Inspection (ISI) Program for Class 1, Class 2, and Class 3 pressure retaining components for the 10-year period starting September 26, 1983, to September 26, 1993, and Class 1, Class 2, and Class 3 pump and valve testing for the 10-year period from September 26, 1983, to September 26, 1993.

This program has been developed as required by Sec. 50.55(a) of 10 CFR Part 50 following the guidance of the ASME Boiler Pressure Vessel Code Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components". The ISI Program will be controlled by the Fort Calhoun Station Unit 1 Technical Specifications.

This program is in compliance, where possible, with the applicable requirements of Section XI, of the ASME Boiler and Pressure Vessel Code, 1980 Edition through Winter of 1980 Addenda.

This program incorporates the results of previous inservice and preservice inspections. It is the intent of the Licensee to continue to review and apply, as appropriate, changes in the code which would improve the total ISI Program, pursuant to 10 CFR 50.55(a).

PART 1: Class 1, Class 2, and Class 3 Pressure Retaining Components

1.1 Scope and Responsibility

1.1.1 The Piping and Instrumentation Drawings (P&IDs) in Appendix 1A identify the class boundaries. These are always under review and are subject to change.

1.1.2 Class 1 and Class 2 components and the methods of examination for each component are listed in Tables 1.1 and 1.2, respectively. Class 3 components are those found on the P and IDs in Appendix 1A. The specific components to be examined for each class shall be identified in the Fort Calhoun Station Unit 1 Inservice Examination Plan by title and/or number. Class 3 components will be examined to the extent required by IWD-2500. Class 3 portions of the Waste Disposal System have been optionally classified as Class 3 in accordance with Subarticle IWA-1300, Paragraph (g.) of the Section XI Code. Examination in accordance with the rules of Article IWD will not be performed on the Class 3 portion of the Waste Disposal System. Exceptions to compliance with Tables IWB-2500 and IWC-2500 of Section XI are listed in Appendix 1B and Appendix 1C, respectively.

1.2 Inspection Intervals

1.2.1 The inspection intervals for Class 1, Class 2, and Class 3 components will be 10-year intervals of service commencing on September 26, 1973. As indicated previously, this program plan covers the second 10-year interval, i.e., September 26, 1983, to September 26, 1993.

Ten-year examination plans will describe the distribution of examinations within the inspection intervals in accordance with IWB-2400, IWC-2400, and IWD-2400 of Section XI.

1.2.2 The inspection intervals may be extended by as much as one year to permit inspections to be concurrent with plant outages as permitted by IWA-2400(c) of Section XI.

1.2.3 Selection of Class 1 and Class 2 pressure retaining piping welds for examination shall be in accordance with the requirements of the 1974 edition of Section XI, Summer of 1975 Addenda.

1.3 Examination Categories

1.3.1 Class 1 components will be examined to the extent and frequency required by Table IWB-2500-1 of Section XI.

1.3.2 Class 2 components will be examined to the extent and frequency as required by Table IWC-2500-1 of Section XI.

1.3.3 Class 3 components as described in the 10-year examination plan shall be examined to the extent and frequency as required by Table IWD-2500-1 of Section XI. Open-ended portion of a system extending to the first shutoff valve and buried systems components shall be exempted from pressure test and from inspection where accessibility is restricted.

1.4 Examination Methods

1.4.1 Class 1 and Class 2 components shall be examined by the required visual, surface, and volumetric examinations. These examinations shall include one or a combination of the following methods: visual (VT), liquid penetrant (PT), magnetic particle (MT), radiographic (RT), and Ultrasonic (UT). Ultrasonic examinations (UT) shall be performed in accordance with the following:

1.4.1.1 Ultrasonic examination of ferritic vessels with a wall thickness greater than 2 inches (51 mm) shall be conducted in accordance with Article 4 of Section V.

1.4.1.2 The ultrasonic examination of ferritic piping will be performed in accordance with the procedural requirement of Appendix III to the Winter 1980 Addenda, ASME, Section XI.

The ultrasonic examination of Austinitic stainless steel piping will be performed in accordance with the procedural requirement of Appendix III to the Winter 1980 Addenda, ASME, Section XI, Supplement 7.

1.4.1.3 The following examination areas shall apply only to SI and CS systems piping. The volumetric examinations of Class 2 circumferential pipe welds will conform to the additional examination requirements of IE Circular 76-06, dated November 24, 1976, in that the examined area shall, where possible, cover a distance of approximately six times the pipe wall thickness (but not less than two inches and not to exceed eight inches) on each side of the weld.

1.4.2 Class 3 components shall be visually examined for leakage in accordance with Article IWD-2600 of Section XI.

1.5 Evaluation of Examination Results

1.5.1 Class 1 Components

1.5.1.1 The evaluation of the nondestructive examination results shall be in accordance with Article IWB-3000 of Section XI. All indications shall be subject to comparison with previous data to help in characterization and in determining origin.

1.5.2 Class 2 Components

1.5.2.1 The evaluation of nondestructive examination results shall be in accordance with Article IWC-3000 of Section XI. All indications shall be subject to comparison with previous data to help in characterization and in determining origin.

1.5.3 Class 3 Components

1.5.3.1 The evaluation of the visual examination results shall be in accordance with Article IWA-5000 of Section XI.

1.5.4 Indications which have been recorded in the preservice inspection or in a previous inservice inspection which are not characterized as propagating flaws shall be considered acceptable for continued service.

1.6 <u>Repair Requirements</u>

1.6.1 Repair of Class 1, Class 2, and Class 3 components shall be performed in accordance with Article IWA-4000 of Section XI.

1.6.2 Surface defects in Class 1, Class 2, and Class 3 bolts, studs, nuts, and ligaments may be removed by mechanical means when the removal of a defect will not alter the basic configurations of the item. Bolts, studs, and nuts that have defects that cannot be removed by mechanical means will be replaced.

1.7 <u>System Pressure Testing</u>

1.7.1 General Requirements

1.7.1.1 System pressure tests will be conducted in accordance with Article IWA-5000 of Section XI.

1.7.1.2 Evaluation of any corroded area will be performed in accordance with Article IWA-5000 of Section XI.

1.7.1.3 Repairs of corroded areas shall be performed in accordance with Section 1.6 of this program.

1.7.2 Class 1 Components

1.7.2.1 After each refueling outage, the system will be leak tested in accordance with Article IWB-5000 of Section XI and in accordance with Figures 2-1A and 2-1B of the Technical Specifications.

1.7.2.2 At or near the end of each inspection interval, a hydrostatic pressure test shall be performed on the reactor coolant system components. This test shall be conducted in accordance with the requirements of Article IWA-5000 and Article IWB-5000 of Section XI. Test temperature shall be in accordance with Figures 2-1A and 2-1B of the Technical Specifications.

1.7.2.3 Partial penetration welds on the reactor vessel and the pressurizer shall be examined in accordance with Table IWB-2500 Examination Category B-E of Section XI.

1.7.3 Class 2 Components

1.7.3.1 Pressure tests and visual examination of Class 2 components will be performed in accordance with the guidelines of Section XI. The test pressure will be in accordance with the requirements of Article IWC-5000. Paragraph 2.1.1 of the Technical Specification, which limits the number of cycles at 125% of design pressure to 10 for the secondary system (steam/feedwater) will be considered.

1.7.4 Class 3 Components

1.7.4.1 Class 3 components shall be pressure tested in accordance with Article IWD-5000 of Section XI.

1.8 <u>Records and Reports</u>

Records and reports made in accordance with this program shall be developed and maintained in accordance with Article IWA-6000 of Section XI.

APPENDICES

APPENDIX 1B

Exceptions to Compliance with Table IWB-2500-1
(Class 1 Components) in ASME Boiler and Pressure Vessel Code,
Section XI, 1980 (Winter Addenda)

Item No.	Exception
B 1.40	The closure head to flange weld has physical obstructions which limit the extent of the ultrasonic and surface exams. Specifically, there are twelve seismic skirt mounting lugs, each six inches wide, located 37 inches apart, evenly spaced around the exam area. Thus 72 inches obstruction. Also, due to interference from the seismic skirt and the head flange, the UT scanning is limited to 4 inches either side of the head to flange weld. This restricts the volume of the weld examination, and depending upon the angle of the transducers used may result in less than the code required volume to be examined. Radiation levels of 7-8 R/HR area and 10 R/HR surface have prohibited access to perform the UT from the inside surface of the head. R1
B 3.30	The pressurizer surge line nozzle-to-shell weld cannot be 100% volumetrically examined due to interference from heater penetrations. The area will be volumetrically examined to the extent possible. The weld area will be visually examined for leakage near the end of the inspection interval in accordance with IWB-5221 and IWB-5222.
B 3.40	The pressurizer surge line inside radius section cannot be 100% volumetrically examined due to interference from heater penetrations. The area will be volumetrically examined to the extent possible. The area will be visually examined for leakage near the end of the inspection interval in accordance with IWB-5221 and IWB-5222.
B 6.20 & B 6.30	Closure head studs will be ultrasonically examined from the center drilled hole in accordance with ASME Code Case N-307 as referenced in Regulatory Guide 1.147, Inspection Code Case Acceptability.
B 9.10 - 9.40	The primary piping is fabricated using centrifugally cast stainless steel pipe and cast stainless steel elbows. Experience has shown that these materials and welds are not always amenable to ultrasonic examination. Radiographic techniques have been developed to substantially overcome this problem. Volumetric examination will be performed to the extent practical and according to the

R2 3/84 (Removed
B3.10 Exemption)
R3 8/84 (Removed
B3.20 Exemption)

schedule designated in the Examination Plan. Should other specialized ultrasonic examination techniques become practical which are more effective, they will be incorporated into the Examination Plan.

Inaccessible Piping Welds:

Figure No.*	Line No.	Weld No.
A-22	12 in. - SI-12	16
A-25	12 in. - SI-24	16
A-27	6 in. - SI-14	10
A-27	6 in. - SI-14	11
A-32	3 in. - HPH-22	1
A-32	3 in. - HPH-22	3
A-38	2 in. - HPH-2.12	5
A-42	12 in. - SDC-20	7

The welds listed above are inaccessible for examination because they are located within walls or floors. Areas on either side of the walls or floors containing these piping welds will be examined for signs of leakage during the pressure and hydrostatic testing of the piping systems.

B 12.10 The reactor coolant pump casings are made of cast stainless steel sections which are then welded together. This type of material is not amenable to ultrasonic examination. Further, radiographic examination of Byron Jackson pump casing has not yet been demonstrated to be feasible in an operating environment. Acceptable methods of performing a volumetric examination of these welds may be developed before the end of the second ten year interval. If such methods are found, they will be considered for use at the Fort Calhoun Station. If no acceptable volumetric examination can be performed, a surface exam will be performed on 100% of the casing welds on one pump prior to the end of this 10 year interval.

B 12.20 The District's position is that a visual examination will be performed only if a pump is disassembled for maintenance and permitting such inspection is judged to be adequate based upon design, fabrication, and accessibility considerations.

*See the 10-Year Inservice Examination Plan, Fort Calhoun Station Unit 1

APPENDIX 1C

Exceptions to Compliance with Table IWC-2500-1

Item No. Inaccessible Piping Welds:

Item No.	Figure No.*	Line No.	Weld No.
C5.11 C5.12			
	B-12	12 in. - LPSI-12	4
	B-13	12 in. - LPSI-14	7
	B-13	12 in. - LPSI-14	10
	B-13	12 in. - LPSI-14	11
	B-14	12 in. - LPSI-22	10
	B-15	12 in. - LPSI-24	4

The welds listed above are inaccessible for examination because they are located within walls or floors. Areas on either side of the walls or floors containing these piping welds will be examined for signs of leakage during the pressure testing of the piping system.

*See the 10-Year Inservice Examination Plan, Fort Calhoun Station, Unit 1

APPENDIX 1D

Exceptions to Compliance with Paragraph IWD-2500-1

Item No.	Inaccessible Piping:
D 2.10	Buried raw water lines from the intake structure to the auxiliary building cannot be tested since the isolation valves are not designed to be leak-tight shut-off valves. Flow instrumentation in the system is capable of detecting significant leaks by sensing a reduction of flow.

TABLE 1.1

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1

Item No.	Examination Category Table IWB-2500-1	Components and Parts to be Examined	Method
		Reactor Vessel	
B1.10	B-A	Longitudinal and circumferential shell welds in core region	Volumetric
B1.20*	B-A	Circumferential and meridional head welds	Volumetric
B1.30	B-A	Shell-to-flange circumferential welds	Volumetric
B1.40	B-A	Head-to-flange circumferential weld	Volumetric and Surface
B3.90	B-D	Primary nozzle-to-vessel welds	Volumetric
B3.100	B-D	Nozzle inside radiused section	Volumetric
B4.10	B-E	Vessel penetrations, including control rod drive and instrumentation penetrations	Visual (IWA-5000)
B5.10	B-F	Nozzle-to-safe end welds	Volumetric and Surface
B6.20	B-G-1	Closure studs, in place	Volumetric
B6.30	B-G-1	Closure studs and nuts, when removed	Volumetric and Surface
B6.40	B-G-1	Threads in flange	Volumetric
B6.50	B-G-1	Closure washers, bushing	Visual
B7.10	B-G-2	Pressure-retaining bolting	Visual
B13.10	B-N-1	Vessel interior	Visual
B13.30	B-N-3	Core support structures	Visual
B14.10	B-O	Control rod drive housings	Volumetric or Surface
B15.10	B-P	Exempted components	Visual (IWA-5000)
		Pressurizer	
B2.10	B-B	Longitudinal and circumferential welds	Volumetric
B3.110	B-D	Nozzle-to-vessel welds	Volumetric
B3.120	B-D	Nozzle-to-vessel radiused section	Volumetric
B4.20	B-E	Heater penetrations	Visual (IWA-5000)
B5.20	B-F	Nozzle-to-safe end welds	Volumetric and Surface
B8.20	B-H	Integrally-welded vessel attachments	Volumetric or Surface
B15.20	B-P	Exempted components	Visual (IWA-5000)
B7.20	B-G-2	Pressure-retaining bolting	Visual

*Flow baffles allow internal access to only 25% of the meridional welds.

TABLE 1.1

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1 (CONTINUED)

Item No.	Examination Category Table IWB-2500-1	Components and Parts to be Examined	Method
		Steam Generators (Primary Side)	
B2.30 B2.31 B2.32	B-B	Head welds, circumferential and meridional	Volumetric
B2.40	B-B	Tubesheet-to-head weld	Volumetric
B3.130	B-D	Nozzle-to-vessel	Volumetric
B3.140	B-D	Nozzle inside radius section	Volumetric
B5.30	B-F	Nozzle-to-safe end	Volumetric and Surface
B6.90	B-G-1	Bolts and studs	Volumetric
B6.100	B-G-1	Flange surface, when disassembled	Visual
B6.110	B-G-1	Nuts, bushings, and washers	Visual
B7.30	B-G-2	Bolts, studs, and nuts	Visual
B8.30	B-H	Integrally welded attachments	Volumetric or Surface
B15.30	B-P	All pressure-retaining components	Visual
B16.20	B-Q	Steam generator tubing	Volumetric
B2.50 B2.51 B2.52	B-B	Shell (or head) welds, circumferential and longitudinal (or meridional)	Volumetric
B2.60	B-B	Tubesheet-to-shell (or head) welds	Volumetric
B3.150	B-D	Nozzle-to-vessel welds	Volumetric
B3.160		Nozzle inside radius section	Volumetric
B5.40	B-F	Nozzle-to-safe end welds	Volumetric and Surface
B6.120	B-G-1	Bolts and studs, in place	Volumetric
B6.130	B-G-1	Bolts and studs, when removed	Surface and Volumetric
B6.140	B-G-1	Bolting	Visual
B7.40	B-G-2	Bolts, studs, nuts	Visual
B8.40	B-H	Integrally welded attachments	Volumetric or Surface
B15.4	B-P	Pressure-retaining boundary	Visual

TABLE 1.1

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1 (CONTINUED)

Item No.	Examination Category Table IWB-2500-1	Components and Parts to be Examined	Method
		Piping Pressure Boundary	
B9.10	B-J	Nominal pipe size > 4 in.	Surface
B9.11	B-J	Circumferential welds	Surface and Volumetric
B9.12	B-J	Longitudinal welds	Surface and Volumetric
B9.20	B-J	Nominal pipe size < 4 in.	Surface
B9.21	B-J	Circumferential welds	Surface
B9.22	B-J	Longitudinal welds	Surface
B9.30	B-J	Branch pipe connection welds	Surface
B9.31	B-J	Nominal pipe size > 2 in.	Surface and Volumetric
B9.32	B-J	Nominal pipe size ≤ 2 in.	Surface
B9.40	B-J	Socket welds	Surface
B6.150	B-G-1	Bolts and studs,	Volumetric
B6.160	B-G-1	Flange surface, when disassembled	Visual
B6.170	B-G-1	Nuts, bushings, and washers	Visual
B7.50	B-G-2	Bolts, studs, and nuts	Surface
B10.10	B-K-1	Integrally welded attachments	Volumetric or Surface
B15.50	B-P	Pressure-retaining boundary	Visual
		Pump Pressure Boundary	
B6.180	B-G-1	Bolts and studs	Volumetric
B6.190	B-G-1	Flange surface	Visual
B6.200	B-G-1	Nuts, bushings, and washers	Visual
B10.20	B-K-1	Integrally-welded attachments	Volumetric or Surface
B12.10	B-L-1	Pump casing welds	Visual
B12.20	B-L-2	Pump casings	Visual
B15.60	B-P	Pressure-retaining boundary	Visual (IWA-5000)
B7.60	B-G-2	Bolts, studs, and nuts	Visual

TABLE 1.1

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWB-2500-1 (CONTINUED)

Item No.	Examination Category Table IWB-2500-1	Components and Parts to be Examined	Method
		Valve Pressure Boundary	
B6.210	B-G-1	Bolts and studs, in place	Volumetric
B6.220	B-G-1	Flange surface	Visual
B6.230	B-G-1	Nuts, bushings, and washers	Visual
B7.70	B-G-2	Bolts, studs, and nuts	Visual
B10.30	B-K-1	Integrally welded attachments	Volumetric or Surface
B12.30	B-M-1	Valve body welds < 4 in.	Volumetric
B12.40	B-M-2	Valve body > 4-in. nominal pipe size	Visual
B15.70	B-P	Pressure retaining boundary	Visual

TABLE 1.2

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWC-2500-1

Item No.	Examination Category Table IWC-2500-1	Components and Parts to be Examined	Method
		Pressure Vessels	
C1.10	C-A	Shell circumferential welds	Volumetric
C1.20	C-A	Head circumferential welds	Volumetric
C1.30	C-A	Tube sheet-to-shell weld	Volumetric
C2.10	C-B	Nozzles in vessels ≤ 1/2-in. nominal thickness	Surface
C2.20	C-B	Nozzles in vessels > 1/2-in. nominal thickness	Surface
C2.21	C-B	Nozzle-to-shell (or head) weld	Surface and Volumetric
C2.22	C-B	Nozzle inside radius section	Volumetric
C3.10	C-C	Integrally welded attachments	Surface
C4.10	C-H	Bolts and studs	Volumetric
C7.10	C-H	Pressure-retaining components	Visual
C7.11	C-H	Pressure-retaining components	Visual
		Piping	
C3.40	C-C	Integrally welded attachments	Surface
C4.20	C-D	Bolts and studs	Volumetric
C5.11	C-F	Circumferential welds ≤ 1/2-in. nominal wall thickness	Surface
C5.12	C-F	Longitudinal welds < 1/2-in. nominal wall thicknesss	Surface
C5.21	C-F	Circumferential welds > 1/2-in. nominal wall thickness	Surface and Volumetric
C5.22	C-F	Longitudinal welds > 1/2-in. nominal wall thickness	Surface and Volumetric
C5.31	C-F	Circumferential pipe branch connection welds	Surface
C5.32	C-F	Longitudinal pipe branch connection welds	Surface
C7.20	C-H	Pressure-retaining components	Visual

TABLE 1.2

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWC-2500-1 (CONTINUED)

Item No.	Examination Category Table IWC-2500-1	Components and Parts to be Examined	Method
		Pumps	
C6.10	C-G	Pump casing welds	Surface
C7.30	C-H	Pressure-retaining components	Visual
C3.70	C-C	Integrally-welded attachments	Surface
C4.30	C-D	Bolts and studs	Volumetric
		Valves	
C6.20	C-G	Valve body welds	Surface
C7.40	C-H	Pressure-retaining components	Visual
C3.100	C-C	Integrally-welded attachments	Surface
C4.40	C-D	Bolts and studs	Volumetric

PART 2: Class 1, Class 2, and Class 3 Pump and Valve Tests

2.1 Scope and Responsibility

2.1.1 The P&IDs of Appendix 1A identify the location of each Class 1, Class 2, and Class 3 pump and valve.

2.1.2 Class 1, Class 2, and Class 3 pumps to be tested under Subsection IWP, the test methods for each pump, and exceptions to the tests of Subsection IWP are found in Appendix 2A. The Class 1, Class 2, and Class 3 valves to be tested under Subsection IWV, the methods of testing for each valve, and exceptions to the tests of Subsection IWV are found in Appendices 2B and 2C.

2.2 Inservice Test Frequency

2.2.1 The inservice test frequency for Class 1, Class 2, and Class 3 pumps are in accordance with Article IWP-3000 of Section XI. The inservice test frequency for Class 1, Class 2, and Class 3 valves are in accordance with Article IWV-3000 of Section XI with exceptions as found in Appendix 2C.

2.3 Valve Categories

2.3.1 The valve categories for each Class 1, Class 2, and Class 3 valve have been determined from Article IWV-2000 of Section XI with exceptions as found in Appendix 2C.

2.4 Test Methods

2.4.1 The methods to be used to test Class 1, Class 2, and Class 3 pumps and valves have been determined from the appropriate articles of Subsections IWP and IWV of Section XI, respectively. These methods, along with exceptions, are listed in Appendix 2C and Appendix 2B for Class 1, Class 2, and Class 3 pumps and valves, respectively.

2.5 Evaluation of Test Results

2.5.1 Pumps:

2.5.1.1 The evaluation of test results shall be in accordance with Table IWP-3100-2 of Section XI as appropriate. All test data shall be analyzed within four working days after completion of a test. An allowance of four working days to analyze test data instead of the 96 hour requirement will allow greater flexibility in scheduling and performing the various tests. Special allowances for weekends and holidays will not have to be made in scheduling the tests. The safety-related consequences of completing analysis within four working days rather than 96 hours is not considered to be great, since pump tests are performed on a quarterly basis.

2.5.2 Valves:

2.5.1.2 The evaluation of test results shall be in accordance with the appropriate Subarticles of Article IWV-3000 of Section XI.

2.6 Records and Reports

2.6.1 Records and reports for the testing of Class 1, Class 2, and Class 3 pumps shall be made in accordance with Article IWP-6000 of Section XI. Records and reports for the testing of Class 1, Class 2, and Class 3 valves shall be made in accordance with Article IWV-6000 of Section XI.

2.7 Repair Requirements

2.7.1 Pumps:

2.7.1.1 Tests, after pump replacement, repair or servicing, shall be made as required by Section XI, Article IWP-3000.

2.7.2 Valves:

2.7.2.1 Tests, after valve replacement, repair or maintenance, shall be made as required by Section XI, Article IWV-3000.

APPENDIX 2A

Inservice Testing of Pumps

Discussion: The pumps that require inservice tests for operational readiness under the ASME B & PV Code, Section XI, Subsection IWP are listed below. The inservice test parameters and test frequencies are tabulated for each pump. The requested test exceptions and basis for each exception are given for the applicable parameters.

General: The pumps listed are directly coupled to induction motor drivers; therefore, the rotation speed need not be measured as prescribed in Subarticle IWP-4400. Operating modes, as designated in this appendix, are as follows: Mode 1 - Power Operation, Mode 2 - Hot Standby, Mode 3 - Hot Shutdown, Mode 4 - Cold Shutdown, Mode 5 - Refueling Shutdown.

Low Pressure Safety Injection Pumps SI-1A, B Class 2

P&ID: CE-E-23866-210-130, Sheet 1 of 2 (G4)

Function: The LPSI pumps are available for safety injection of borated water into the reactor coolant system following a LOCA and are used to remove residual heat for cold shutdowns.

Containment Spray Pumps SI-3A, B, C Class 2

P&ID: CE-E-23866-210-130, Sheet 1 of 2 (G3, G2, G2)

Function: The CS pumps are available to spray borated water into containment following a LOCA.

High Pressure Safety Injection Pumps SI-2A, B, C Class 2

P&ID: CE-E-23866-210-130, Sheet 1 of 2 (G6, G7, G7)

Function: The HPSI pumps are available for safety injection of borated water into the reactor coolant system following a LOCA and are used to maintain the required water level in the safety injection tanks.

Test Parameter	Frequency	Subarticle Exceptions	Operating Modes Required for Testing
Inlet Pressure	Quarterly	IWP-3100	1, 2, 3, 4 or 5
Differential Pressure	Quarterly	IWP-3100	1, 2, 3, 4 or 5
Vibration Amplitude	Quarterly		1, 2, 3, 4 or 5
Lubrication Level	Quarterly		1, 2, 3, 4 or 5
Bearing Temperature	Yearly		1, 2, 3, 4 or 5
Flow Rate	-	IWP-3100	-

Exceptions:

IWP-3100 Flow measurement

Basis: Original plant design did not include flow measurement for these pumps. These pumps are in fixed resistance systems. The inservice testing of differential pressure across these pumps under a minimum recirculation flow condition (and thus near shutoff head) is deemed adequate to allow determination of pump functionality and or degradation.

IWP-3100 Inlet and differential pressure measurement

Basis Inlet pressure for these tests will be determined by measuring the static head tank level.

Charging Pumps CH-1A, B, C Class 2

P&ID: CE-E-23866-210-120, Sheet 1 of 2 (E6, E4, E3)

Function: The charging pumps are provided to return the purification flow to the reactor coolant system during plant steady state operations.

Test Parameter	Frequency	Operating Mode Required for Testing
Inlet Pressure	Quarterly	1, 2 or 3
Differential Pressure	Quarterly	1, 2 or 3
Flow Rate	Quarterly	1, 2 or 3
Vibration Amplitude	Quarterly	1, 2 or 3
Lubricant Level and Pressure	Quarterly	1, 2 or 3
Bearing Temperature	Yearly	1, 2 or 3

Component Cooling Pumps AC-3A, B, C Class 3

P&ID: GHDR-11405-M-10 (D2, C2, B2)

Function: The component cooling pumps supply cooling water to equipment in the containment and auxiliary building.

Test Parameter	Frequency	Subarticle Exceptions	Operating Modes Required for Testing
Inlet Pressure	-	IWP-3100	-
Differential Pressure	-	IWP-3100	-
Flow Rate	-	IWP-3100	-
Vibration Amplitude	Quarterly	-	1, 2, 3, 4 or 5
Lubricant Level of Pressure	-	IWP-3100	-
Bearing Temperature	Yearly	-	1, 2, 3, 4 or 5

Exceptions

IWP-3100 Inlet and differential pressure measurement

Basis: System design does not include instrumentation for measuring these parameters. Discharge pressure will be measured on a quarterly schedule to help determine possible pump degradation.

Establishment of a reference value for flow rate

Basis: There are many components or subsystems on the component cooling water system with several possible piping configurations. Some of the components are critical elements to which the flow rate cannot arbitrarily be varied for the sake of running a pump test. Consequently, establishing a reference flow rate for a pump test on a periodic basis is impractical.

Lubricant level or pressure observation

Basis: The pump bearings are cartridge type that have been pre-packed with the proper amount of grease and under normal conditions require no further attention for the life of the bearings.

Reference: Ingersoll Rand Instruction Manual

Boric Acid Pumps CH-4A, B Class 3

P&ID: CE-E-23866-210-121

Function: The boric acid pumps supply blended boric acid to the charging pump header and provide makeup to the SIRW and volume control tanks.

Test Parameter	Frequency	Subarticle Exceptions	Operating Modes Required for Testing
Inlet Pressure	Quarterly	IWP-3100	1, 2, 3, 4 or 5
Differential Pressure	Quarterly	IWP-3100	1, 2, 3, 4 or 5
Vibration Amplitude	Quarterly	-	1, 2, 3, 4 or 5
Lubricant Level	Quarterly	-	1, 2, 3, 4 or 5
Bearing Temperature	Yearly	-	1, 2, 3, 4 or 5
Flow Rate	-	IWP-3100	-

Exceptions:

IWP-3100 Flow measurement

Basis: Original plant design did not include flow measurement for these pumps. These pumps are in fixed resistance systems. The inservice testing of differential pressure across these pumps under a minimum recirculation flow condition (and thus near shutoff head) is deemed adequate to allow determination of pump functionality and/or degradation.

Inlet and differential pressure measurement.

Basis: Inlet pressure will be determined by measuring the static head tank level.

Raw Water Pumps AC-10A, B, C, D Class 3

P&ID: GHDR-11405-M-100

Function: The raw water pumps provide a cooling medium for the component cooling water system.

Test Parameter	Frequency	Subarticle Exceptions	Operating Modes Required for Testing
Inlet Pressure	-	IWP-3100	-
Differential Pressure	-	IWP-3100	-
Flow Rate	-	IWP-3100	-
Vibration Amplitude	Quarterly	-	1,2,3,4 or 5
Bearing Temperature	-	IWP-3100	-
Discharge Pressure vs. Motor Amperage	Quarterly	IWP-3100	1,2,3,4 or 5

Exceptions:

IWP-3100 Inlet pressure measurement

Basis: System design does not permit direct measurement of inlet pressure. Varying river level and unknown accumulations of sand near the pump suction bell make it impossible to determine the inlet pressure.

Differential pressure measurement

Basis: Because of the inability to measure inlet pressure, differential pressure measurement is not possible.

Flow rate measurement

Basis: The system design does not provide an accurate indication of flow rate due to fouling by untreated river water.

Bearing temperature measurement

Basis: All bearings are inaccessible for temperature measurement. All are submerged in river water.

Discharge pressure vs. motor amperage

Basis: To be performed in lieu of a differential pressure measurement. An acceptable motor amperage value will be determined over a discharge pressure range of 26 through 40 psig.

Auxiliary Feedwater Pumps FW-6, FW-10 Class 3

P&ID: GHDR-11405-M-253

Function: The auxiliary feedwater pumps provide water to the steam generators when normal condensate feedwater flow is unavailable.

Test Parameter	Frequency	Subarticle Exceptions	Required for Testing
Inlet Pressure	Quarterly	IWP-3100	1, 2 or 3
Differential Pressure	Quarterly	IWP-3100	1, 2 or 3
Flow Rate	Quarterly	-	1, 2 or 3
Vibration Amplitude	Quarterly	-	1, 2 or 3
Bearing Temperature	Yearly	-	1, 2 or 3

Exceptions:

IWP-3100 Inlet pressure measurement

Basis: System design does not permit direct measurement of inlet pressure. Inlet pressure to be measured by observing Aux FW tank level or head.

Differential pressure measurement

Basis: Because of the inability to measure inlet pressure, direct differential pressure measurement is not possible, but it will be calculated by subtracting input from output pressure (in consistent units.)

APPENDIX 2B

Inservice Testing of Valves

Discussion: Valves that require an inservice test for operational readiness under the ASME B & PV Code, Section XI, Subsection IWV, are listed below. Test parameters, frequencies, and test exceptions are tabulated for each valve.

It has been determined that there are no Category D valves at the Fort Calhoun Station Unit 1 which are subject to the inservice inspection program.

All Category A valves, unless otherwise noted, will be leak-rate tested, once every two years, during Cold Shutdown (CS) or during a Refueling Outage (RO).

TABLE 2B-1

The following Category A valves are listed in groups representing those valves which shall be leak-rate tested simultaneously due to system configuration.

1. TCV-202, HCV-204
2. HCV-241, HCV-206
3. HCV-506A, HCV-506B
4. HCV-507A, HCV-507B
5. HCV-467A, HCV-467B
6. HCV-467C, HCV-467D
7. HCV-438A, HCV-438B
8. HCV-438C, HCV-438D
9. HCV-500A, HCV-500B
10. HCV-2983, SI-185, HCV-2956, HCV-2976, HCV-2936, HCV-2916, PCV-2949, HCV-2969, PCV-2909, PCV-2929
11. HCV-509A, HCV-509B
12. HCV-508A, HCV-508B
13. HCV-882, VA-289
14. HCV-425A, HCV-425B
15. HCV-425C, HCV-425D
16. HCV-2603A, HCV-2603B
17. HCV-2604A, HCV-2604B
18. HCV-2504A, HCV-2504B
19. PCV-742E, PCV-742F
20. PCV-742G, PCV-742H
21. HCV-746A, HCV-746B
22. HCV-881, VA-280
23. HCV-1560A, HCV-1560B
24. HCV-1559A, HCV-1559B
25. PCV-742A, PCV-742B
26. PCV-742C, PCV-742D

Justification for Exception to ASME Section XI Code

Category A Valves

PCV-742A
742B
742C
742D

These valves are passive since they are used for containment purge air isolation and are required to be closed during normal operations and cold shutdowns. They are in the position required to fulfill their design function and when open could provide a direct path for release of contaminants from containment; therefore, stroking these valves could result in a release of contaminants. Since these valves are passive, they are not required to be exercise tested.

In addition, valves PCV-742A and 742C cannot be tested in the direction of their design function in accordance with IWV-3420 due to system configuration. The intent of Subsection IWV to verify the leak rate is met, since testing in the direction opposite to the design function will result in a greater leakage than would be experienced in a test in the preferred direction.

HCV-746A

This valve cannot be leak-tested in the direction of its design function in accordance with IWV-3420 due to system configuration. The intent of Subsection IWV to verify the leak rate is met, since testing in the direction opposite to the design function will result in a greater leakage than would be experienced in a test in the preferred direction.

VA-280
289

These valves serve to isolate containment, are designated as Category A, and are locked closed. Cycling of these valves would provide a direct path for release of contaminants from the containment during power operation or cold shutdown. These valves are passive and are not required to be exercise tested.

HCV-881
882

The function of these valves is to isolate containment. They are open only during refueling for containment purge. Stroking would provide a direct path for release of contaminants from the containment. These valves are passive and are not required to be exercise tested.

HCV-1559A 1559B	These valves remain closed during power operation and are passive and are not required to be exercise tested.
HCV-1560A 1560B	These valves remain closed during power operation and are passive and are not required to be exercise tested.
HCV-2504A	This valve serves to isolate the containment reactor coolant system sample link at penetration M-45. This valve cannot be leak-tested in the direction of its design function in accordance with IWV-3420 due to system configuration. The intent of Subsection IWV to verify the leak rate is met, since testing in the direction opposite to the design function will result in a greater leakage than would be experienced in a test in the preferred direction.
HCV-1749	This valve serves to isolate containment penetration M-74, compressed air penetration. This valve cannot be leak-tested in the direction of its design function in accordance with IWV-3400 due to system configuration. The intent of Subsection IWV of the Section XI code, to verify the operational readiness, is met since testing in the direction opposite to the design function will result in a greater leakage than would be experienced in a test in the preferred direction. This valve is passive and it is not required to be exercise tested.
HCV-425A 425B 425C 425D	These valves serve to isolate containment penetrations M-39 and M-53, component cooling system penetrations. Stroking cannot be performed during cold shutdown or at quarterly intervals because failure of these valves in the closed position would terminate cooling to safety injection tanks leakage coolers which would in turn have potential for resulting in hot fluid streams entering ion exchange resins of chemical volume control system, thereby causing damage. These valves cannot be partial-stroked because they are either fully opened or fully closed. These valves shall be exercise tested during each refueling outage.
HCV-438A 438B 438C 438D	These valves serve to isolate containment penetrations M-18 and M-19, component cooling system penetrations. Stroke-testing cannot be performed at quarterly or cold shutdown because one or more reactor coolant pumps are in operation at all times and these pumps require lube oil and seal cooling. Stroking of these valves would terminate lube oil and seal cooling.

These valves cannot be partial-stroked because they are either fully opened or fully closed. These valves shall be exercise tested during each refueling outage.

HCV-467A 467B 467C 467D	These valves serve to isolate containment penetrations M-15 and M-11, component cooling system penetrations. These valves cannot be stroked quarterly because failure of the valve during testing would render the nuclear detector well cooling units inoperable. Should the nuclear detector well cooling units fail, Technical Specification 2.13 could not be met. These valves cannot be partial-stroked because they are either fully opened orfully closed. These valves shall be exercise tested each cold shutdown or refueling outage. "These valves shall be cycled once each cold shutdown, but not to exceed once every three months."
HCV-2603B 2604B	These valves serve to isolate containment penetrations M-42 and M-43 for the nitrogen gas header. These valves cannot be leak-tested in the direction of their design function in accordance with IWV-3420 due to system configuration. The intent of Subsection IWV to verify the leak rate is met since testing in the direction opposite to the design function will result in a greater leakage than would be experienced in a test in the preferred direction.
PCV-1849	This valve serves to isolate instrument air pressure (via penetration M-73) to containment systems. Stroke-testing cannot be performed at cold shutdown or quarterly since instrument air must be available at all times during operation and cold shutdown. The valve cannot be partial-stroked because it is either fully opened or fully closed. This valve shall be exercise tested during each refueling outage.
TCV-202	This valve is used for RCS loop 2A, letdown isolation and temperature regulation. Stroking of this valve quarterly during operation or at cold shutdowns could result in the termination of the charging and letdown flows. This could isolate the boronmeter, process radiation monitor, and reactor coolant system purification process and could have the potential of causing a reactivity excursion. The valve cannot be partial-stroked because it is either fully open or fully closed. It shall be exercise tested during each refueling outage.

HCV-206 This valve serves as penetration M-7 isolation. This valve cannot be stroked when the reactor coolant system is pressurized because controlled bleed-off must be maintained to prevent damage to the reactor coolant pump seal. The valve cannot be partial-stroked because it is either fully open or fully closed. It shall be exercised during each refueling outage.

HCV-241 This valve is used for reactor coolant pump control bleed-off isolation. It cannot be stroked when the reactor coolant system is pressurized, because controlled bleed-off flow must be maintained to prevent damage to the reactor coolant pump seals. The valve cannot be partial-stroked because it is either fully open or fully closed. It shall be exercised during each refueling outage.

HCV-204 The function of this valve is for containment penetration M-2 isolation and letdown control. The stroking of this valve quarterly during operation or at cold shutdown would result in termination of the charging and letdown flows. This would also isolate the boronmeter, process radiation monitor, and reactor coolant system purification process. In addition, the potential would exist for a reactivity excursion. The valve cannot be partial-stroked because it is either fully open or fully closed. It shall be exercise tested during each refueling outage.

SI-185 This valve is used to isolate the fill line for safety injection tanks. This is a passive manually operated valve which is locked closed and therefore does not require an exercise test. The valve will be leak tested in accordance with Category A leak testing requirements.

HCV-2916
2936
2956
2976

The function of these valves is to permit filling and draining of safety injection tanks. These valves cannot be stroked because doing so would cause level fluctuations in the safety injection tanks. The level of the safety injection tanks is controlled by Technical Specifications, and stroking the valves may result in a violation of these Technical Specifications. It shall be exercise tested during each refueling outage.

SI-194 195 197 198 200 201 203 204	These valves function to prevent back-flow through the safety injection pump discharge headers. These valves cannot be stroke-tested during cold shutdowns or quarterly during operation because to do so using the safety injection system would require introducing cold water into the reactor coolant system causing thermal shock and possibly a reactivity excursion. To do so using the chemical volume control system would disrupt charging and letdown flow to the reactor coolant system causing chemical and volume control to the system to be disrupted. Testing shall be performed per Tech. Spec. 2.1.1 (12), and Tech. Spec. 3.3(3).
SI-208 212 216 220	These valves function to prevent back-flow from the reactor coolant system through the safety injection system. These valves cannot be tested during cold shutdowns or quarterly during operation because to do so would introduce cold charging water to the reactor coolant system causing thermal shock. The valves cannot be partial-stroked for the same reasons. Testing shall be performed per Tech. Spec. 2.1.1 (12) and Tech. Spec. 3.3(3).

Category B Valves

HCV-2506A 2506B 2507A 2507B	These valves serve to isolate steam generator blowdown sampling lines. Stroke-testing cannot be performed quarterly during operation because doing so would terminate blowdown sample line flow. The steam generator blowdown activity monitor is on the sample line. Technical Specification 2.9(1)d requires that blowdown activity shall be continuously monitored by the steam generator blowdown sample monitoring system. Partial-stroking cannot be performed since these valves are either fully opened or fully closed. These valves shall be cycled each cold shutdown, but not to exceed once every three months.
HCV-400A,B,C,D 401A,B,C,D 402A,B,C,D 403A,B,C,D	These valves serve to isolate component cooling to containment air cooling and filtering units. They cannot be cycled quarterly because doing so would terminate component cooling to air cooling and filtering units in containment. These valves shall be cycled each cold shutdown but not to exceed once every three months.
HCV-1041A 1042A	These valves serve to isolate the main steam headers. They cannot be tested quarterly during operation because doing so would isolate steam flow in the steam generators and result in a turbine and reactor trip. The valves cannot be partial-stroked because they are either fully opened or fully closed. These valves shall be tested per Tech. Spec. 3.8. each refueling outage.
HCV-1041C 1042C	These valves serve to provide a pathway from the steam generator to a steam dump and bypass valves in the event that the main steam isolation valves close. These valves are also used to preheat the turbine and related steam system during startup. Cycling of these valves on a quarterly basis during operation would cause the main steam isolation valves to close, causing the turbine to trip and resulting in a reactor trip. The valves cannot be partial-stroked for the same reason. These valves shall be cycled each cold shutdown, but not to exceed once every three months.
HCV-1385 1386	These valves serve to isolate main feedwater to the steam generators. Quarterly stroke-testing cannot be performed during operation because doing so would isolate feedwater to steam generators resulting in a reactor trip. These valves cannot be partial-stroked because they are either fully opened or fully closed. These valves shall be cycled each cold shutdown, but not to exceed once every three months.

HCV-1387A 1387B 1388A 1388B	These valves serve to isolate steam generator blowdown. They cannot be stroke-tested during operation quarterly because doing so would terminate steam generator blowdown and disrupt all volatile chemistry control. They cannot be partial-stroked because they are fully opened or fully closed. These valves shall be cycled each cold shutdown, but not to exceed once every three months.
LCV-218-2	This valve functions to provide volume control tank level control. The valve cannot be stroke-tested in either cold shutdown or quarterly because doing so would terminate charging flow to the reactor coolant system and would have the potential for disrupting pressurizer level regulation. Pressurizer level regulation disruption can lead to reactor coolant system overpressure transients. Partial stroke-testing cannot be performed because the valve is either fully opened or fully closed. It shall be exercised each refueling outage.
HCV-258 265	These valves serve to isolate concentrated boric acid from the charging pump suction header. These valves cannot be cycled during cold shutdown or quarterly because doing so would cause concentrated boric acid to be injected into the reactor coolant system via charging pump suction header gravity feedline. Boration of the primary system during normal operation would cause reactivity transients and possibly shut down the plant and during cold shutdowns would delay startup. These valves cannot be partial-stroked for the same reason. These valves shall be exercise tested during each refueling outage.
HCV-268	This valve serves to permit direct feed of concentrated boric acid solution to the charging pump suction header. This valve cannot be stroke-tested during cold shutdown or quarterly because doing so would allow concentrated boric acid storage to the charging pump suction header through the boric acid pumps. Boration of the primary system during normal operation would cause reactivity transients and possibly shut down the plant and during cold shutdowns would delay startup. The valve cannot be partial-stroked for the same reason. The valve shall be exercise tested during each refueling outage.

HCV-344 345	These valves serve as containment spray isolation. Stroke-testing during cold shutdown or quarterly is not advisable since the potential for spraying down the containment is increased. These valves represent the only boundary between the safety injection pump header and containment spray nozzles. The valves cannot be partial-stroked for the same reason. These valves shall be execised each refueling outage.
HCV-240	Cycling this valve during operation would cause excess pressurizer spray, causing a reactivity excursion. These valves will be cycled at refueling outage.
HCV-249	Cycling this valve during operation would cause excess pressurizer spray, causing a reactivity excursion. These valves will be cycled at refueling outage.

Category C Valves

AC-101 104 107	These valves shall be tested to ensure they open, during normal component cooling water pump cycling.
RW-115 117 121 125	These valves shall be tested to ensure they open, during normal raw water pump cycling.
FW-161 162	These valves are normally open during operation and to cycle these valves closed would result in a loss of normal feedwater to the Steam Generators (S.G.) This may result in S.G. water level drop and possible reactor trip. These valves shall be exercise tested each cold shutdown or refueling outage. In the case where more than one cold shutdown or refueling occurs during a three-month period of time, the valve(s) shall only be exercise tested once during that three-month period. Since failure of these valves to function in the back flow direction would not interfere with the plant's ability to shut down or mitigate the consequences of an accident, these valves shall only be tested in the forward flow direction.
FW-163 164	These valves open for auxiliary feedwater flow to the S.G. Cycling these valves during operation would result in cold water injection to a portion of the S.G., normally at operating temperatures. These valves will be cycled open during start-up after each cold shutdown. These valves shall be exercise tested each cold shutdown or refueling outage. In the case where more than one cold shutdown or refueling occurs during a three-month period of time, the valve(s) shall only be exercise tested once during that three-month period. Since failure of these valves to function in the back flow direction would not interfere with the plant's ability to shut down or mitigate the consequences of an accident, these valves shall only be tested in the forward flow direction.
CH-198	This valve functions to prevent back-flow to the charging pump discharge header. The valve is normally open and there is no way that back-seating can be tested on reversal of flow due to system piping arrangements. Partial stroke-testing cannot be performed for the same reason. Forward flow testing shall be performed at each refueling outage.
CH-143 155	These valves serve to permit direct feed of concentrated boric acid solution to the charging pump suction header. These valves cannot be stroke-tested during cold shutdown or quarterly because doing so would allow concentrated boric acid storage to the charging pump suction header through the boric acid pumps. Boration of the primary

system during normal operation would cause reactivity transients and possibly shutdown the plant and during cold shutdowns would delay startup. These valves cannot be partial-stroked for the same reason. These valves shall be exercise tested during each refueling outage.

SI-100
113

These valves serve to prevent back-flow from high pressure headers to main safety injection headers. They cannot be fully exercise tested during operation, quarterly or during cold shutdowns, since to do so would require safety injection to the reactor coolant system. Partial-stroking, quarterly, is possible since these pumps can be placed in a minimum recirculation mode of operation.

SI-102
108
115
121
129
135
143
149

These valves function to prevent back-flow to high pressure and low pressure safety injection pumps and containment spray pumps. They cannot be tested during operation quarterly or at cold shutdowns because doing so would disrupt the safeguard system alignment, and safety injection into the containment or the reactor system would be required for valve testing. Partial-stroking cannot be performed for the same reasons. Exercising shall be performed during each refueling outage.

SI-139
140

These valves function to prevent back-flow to the safety injection and refueling water tank. They will be partial-stroke exercised every three months and full-stroke exercised each refueling outage. Full-stroke testing cannot be performed during cold shutdown or quarterly during operation because doing so would require safety injection to the containment or reactor coolant system. A safety injection to the reactor coolant system during operation would cause uncontrolled boration and would introduce a thermal shock to the system. The recirculation lines used for testing LPSI and HPSI pumps for partial-stroking are not large enough to fully open the check valves.

SI-159
160

These valves function to prevent backflow to the containment lower level and are normally closed. They are backed up by motor operated isolation valves, HCV-383-3 and HCV-383-4, which are normally closed, fail as is, and open only upon receipt of a containment recirculation actuation signal.

No feasible means exist to perform an in-place operational test of valve SI-159 or SI-160. In lieu of the required testing frequency, of once per quarter, the District shall remove and inspect either SI-159 or SI-160 during the first five years of the 10-year inspection interval. During the second five years of the 10-year interval, the other valve will be inspected.

These inspections shall photographically document the valve's condition and shall manually test the valve disk for free movement. This shall duplicate the inspection done in 1980 and 1981 in response to an NRC request. (In the June 29, 1981 letter from Robert Clark of the NRC to W. C. Jones of OPPD, the attached Safety Analysis clearly indicated that upon receiving an acceptable inspection report from the District on the condition of SI-160, the NRC would consider inspection of SI-159 and SI-160 on a five-year basis adequate for this ISI interval. In the same letter, it was noted that this exception should be presented with other exceptions for the ISI program.)

Due to the timing of the first two inspections, our next inspection will be of valve SI-159, during or prior to 1986, and SI-160 will be examined during or prior to 1991.

SI-175
176

These valves serve to prevent back-flow from the containment spray headers. These valves cannot be tested to the open position since to do so could cause spray in containment. Not stroking these valves poses no safety impact for the following reasons:

1. Adequate heat removal from containment can be achieved during a DBA by use of only one containment spray header with three containment spray pumps. Hence, only one of the check valves is required to open.

2. The containment air filtration and cooling system is fully redundant to the containment spray system.

3. The containment air filtration and cooling system contains redundant components. During a DBA, sufficent iodine removal is achieved with 50% of the system operating and sufficient pressure reduction accomplished with any three air coolers operating.

SI-196
199
202
205

These valves function to prevent back-flow through the safety injection pump discharge headers. These valves cannot be stroke-tested during cold shutdowns or quarterly during operation because to do so using the safety injection system would require introducing cold water into the reactor coolant system causing thermal shock and possibly a reactivity excursion. To do so using the chemical volume control system would disrupt charging and letdown flow to the reactor coolant system causing chemical and volume control to the system to be disrupted. Exercising shall be performed during each refueling outage.

SI-207 211 215 219	These valves function to isolate reactor coolant pump leakage flow from the safety injection tanks. These valves cannot be stroke-tested during cold shutdowns or quarterly during operation as to do so would cause drainage from the safety injection tanks. Technical Specifications require safety injection tank levels to be maintained. The valves cannot be partial-stroked for the same reason. Exercising shall be performed during each refueling outage.

Definitions and Clarifications

Inservice testing at cold shutdown: Valve testing should commence not later than 48 hours after shutdown and continue until complete or plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during subsequent cold shutdown to meet the code required testing frequency.

Exception: A deviation from a requirement of ASME IX and applicable addenda due to the impracticality of the requirement within the meaning of 10 CFR 50.55(a).

REFERENCES

1. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, July 1, 1980, Edition of Section XI through the Winter 1980 Addenda.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, July 1, 1980, Edition of Section V through the Winter 1980 Addenda.

3. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, 1974 Edition of Section XI through the Summer 1975 Addenda.

CATEGORY A VALVES

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
PCV-742A(VA)	Butterfly	GHDR-11405-M-1	D4	42"		18000 sccm 60 psig	2	(AP)	NA	NC, FC	Ex
PCV-742B(VA)	Butterfly	GHDR-11405-M-1	E4	42"		18000 sccm 60 psig	2	(AP)	NA	NC, FC	Ex
PCV-742C(VA)	Butterfly	GHDR-11405-M-1	D4	42"		18000 sccm 60 psig	2	(AP)	NA	NC, FC	Ex
PCV-742D(VA)	Butterfly	GHDR-11405-M-1	E4	42"		18000 sccm 60 psig	2	(AP)	NA	NC, FC	Ex
PCV-742E(VA)	Saunders Diaphragm	GHDR-11405-M-1	E3	1"		2000 sccm 60 psig	9	(AD)	Q	NO, FC	
PCV-742F(VA)	Saunders Diaphragm	GHDR-11405-M-1	E2	1"		2000 sccm 60 psig	9	(AD)	Q	NO, FC	
PCV-742G(VA)	Saunders Diaphragm	GHDR-11405-M-1	E2	1"		2000 sccm 60 psig	9	(AD)	Q	NO, FC	
PCV-742H(VA)	Saunders Diaphragm	GHDR-11405-M-1	E2	1"		2000 sccm 60 psig	9	(AD)	Q	NO, FC	
HCV-746A(VA)	Gate	GHDR-11405-M-1	E3	2"		5000 sccm 60 psig	8	(AD)	Q	NC, FC	Ex
HCV-746B(VA)	Gate	GHDR-11405-M-1	E3	2"		5000 sccm 60 psig	8	(AD)	Q	NC, FC	

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CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
VA-280(VA)	Butterfly	GHDR-11405-M-1	E5	4"		8000 sccm 60 psig	NA	(HO)	NA	LC	Ex
VA-289(VA)	Butterfly	GHDR-11405-M-1	E5	4"		8000 sccm 60 psig	NA	(HO)	NA	LC	Ex
HCV-881(VA)	Butterfly	GHDR-11405-M-1	D5	4"		8000 sccm 60 psig	NA	(AP)	NA	NC, FC	Ex
HCV-882(VA)	Butterfly	GHDR-11405-M-1	D5	4"		8000 sccm 60 psig	NA	(AP)	NA	NC, FC	Ex
HCV-1559A(DW)	Saunders Diaphragm	GHDR-11405-M-5	G3	2.5"		5000 sccm 60 psig	NA	(AD)	NA	NC, FC	Ex
HCV-1559B(DW)	Saunders Diaphragm	GHDR-11405-M-5	G3	2.5"		5000 sccm 60 psig	NA	(AD)	NA	NC, FC	Ex
HCV-1560A(DW)	Saunders Diaphragm	GHDR-11405-M-5	G4	2"		5000 sccm 60 psig	NA	(AD)	NA	NC, FC	Ex
HCV-1560B(DW)	Saunders Diaphragm	GHDR-11405-M-5	G4	2"		5000 sccm 60 psig	NA	(AD)	NA	NC, FC	Ex
HCV-500A(WD)	Saunders Diaphragm	GHDR-11405-M-6	F3	4"		8000 sccm 60 psig	66	(AD)	Q	NC, FC	
HCV-500B(WD)	Saunders Diaphragm	GHDR-11405-M-6	F3	4"		8000 sccm 60 psig	66	(AD)	Q	NC, FC	

CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-506A(WD)	Saunders Diaphragm	GHDR-11405-M-7	A3	2"		5000 sccm 60 psig	16	(AD)	Q	NC, FC	
HCV-506B(WD)	Saunders Diaphragm	GHDR-11405-M-7	A3	2"		5000 sccm 60 psig	16	(AD)	Q	NO, FC	
HCV-2504A(SL)	Gate	GHDR-11405-M-12	B1	0.38"	6450 sccm 2500 psig	1000 sccm 60 psig	1.5	(AD)	Q	NO, FC	Ex
HCV-2504B(SL)	Gate	GHDR-11405-M-12	B1	0.38"	6450 sccm 2500 psig	1000 sccm 60 psig	1.5	(AD)	Q	NO, FC	
HCV-1749(CA)	Gate	GHDR-11405-M-13	D1	4"		8000 sccm 60 psig	NA	(AD)	NA	NC, FC	Ex
HCV-425A(AC)	Globe	GHDR-11405-M-40	E2	3"		10000 sccm 60 psig	21	(AD)	RO	NO, FC	Ex
HCV-425B(AC)	Globe	GHDR-11405-M-40	E3	3"		10000 sccm 60 psig	21	(AD)	RO	NO, FC	Ex
HCV-425C(AC)	Globe	GHDR-11405-M-40	G2	3"		10000 sccm 60 psig	21	(AD)	RO	NO, FC	Ex
HCV-425D(AC)	Globe	GHDR-11405-M-40	G3	3"		10000 sccm 60 psig	21	(AD)	RO	NO, FC	Ex
HCV-438A(AC)	Globe	GHDR-11405-M-40	A3	6"		10000 sccm 60 psig	75	(AD)	RO	NO, FO	Ex

CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-438B(AC)	Globe	GHDR-11405-M-40	B3	6"		10000 sccm 60 psig	54	(AD)	RO	NO, FO	Ex
HCV-438C(AC)	Globe	GHDR-11405-M-40	D3	6"		10000 sccm 60 psig	75	(AD)	RO	NO, FO	Ex
HCV-438D(AC)	Globe	GHDR-11405-M-40	D3	6"		10000 sccm 60 psig	54	(AD)	RO	NO, FO	Ex
HCV-467A(AC)	Globe	GHDR-11405-M-40	F3	1.5"		5000 sccm 60 psig	9	(AD)	CS	NO, FC	Ex
HCV-467B(AC)	Globe	GHDR-11405-M-40	F3	1.5"		5000 sccm 60 psig	9	(AD)	CS	NO, FC	Ex
HCV-467C(AC)	Globe	GHDR-11405-M-40	G3	1.5"		5000 sccm 60 psig	9	(AD)	CS	NO, FC	Ex
HCV-467D(AC)	Globe	GHDR-11405-M-40	G3	1.5"		5000 sccm 60 psig	9	(AD)	CS	NO, FC	Ex
HCV-2603A(NG)	Gate	GHDR-11405-M-42	A3	1"		2000 sccm 60 psig	4.8	(AD)	Q	NO, FC	
HCV-2603B(NG)	Gate	GHDR-11405-M-42	A2	1"		2000 sccm 60 psig	4.8	(AD)	Q	NO, FC	Ex
HCV-2604A(NG)	Gate	GHDR-11405-M-42	C2	1"		2000 sccm 60 psig	5.7	(AD)	Q	NO, FC	

CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-2604B(NG)	Gate	GHDR-11405-M-42	C2	1"		2000 sccm 60 psig	5.7	(AD)	Q	NO, FC	Ex
HCV-507A(WD)	Saunders Diaphragm	GHDR-11405-M-98	A2	3"		6000 sccm 60 psig	26	(AD)	Q	NO, FC	
HCV-507B(WD)	Saunders Diaphragm	GHDR-11405-M-98	A2	3"		6000 sccm 60 psig	26	(AD)	Q	NO, FC	
HCV-508A(WD)	Saunders Diaphragm	GHDR-11405-M-98	A5	0.5"		1000 sccm 60 psig	4.8	(AD)	Q	NO, FC	
HCV-508B(WD)	Saunders Diaphragm	GHDR-11405-M-98	A5	0.5"		1000 sccm 60 psig	4.8	(AD)	Q	NO, FC	
HCV-509A(WD)	Saunders Diaphragm	GHDR-11405-M-98	A5	0.5"		1000 sccm 60 psig	4.8	(AD)	Q	NO, FC	
HCV-509B(WD)	Saunders Diaphragm	GHDR-11405-M-98	A5	0.5"		1000 sccm 60 psig	4.8	(AD)	Q	NO, FC	
PCV-1849(IA)	Gate	GHDR-11405-M-264 -1 if 5	F5	2"		5000 sccm 60 psig	15	(AD)	RO	NO, FC	Ex
TCV-202(CH)	Globe	CE-E-23866- 210-120-1 of 2	A5	2"	32300 sccm 2500 psig	5000 sccm 60 psig	51	(AD)	RO	NO, FC	Ex
HCV-206(CH)	Globe	CE-E-23866- 210-120-1 of 2	C3	0.75"	1580 sccm 150 psig	1000 sccm 60 psig	21	(AD)	RO	NO, FC	Ex

CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-241(CH)	Globe	CE-E-23866-210-120-1 of 2	C3	0.75"	1500 sccm 150 psig	1000 sccm 60 psig	14	(AD)	RO	NO, FC	Ex
HCV-204(CH)	Globe	CE-E-23866-210-120-2 of 2	A7	2"	32300 sccm 2500 psig	5000 sccm 60 psig	16	(AD)	RO	NO, FC	Ex
HCV-347(SI)	Gate	CE-E-23866-210-130-1 of 2	B5	10"		88000 sccm 60 psig	NA	(MO)	NA	LC	
HCV-383-3(SI)	Butterfly	CE-E-23866-210-130-1 of 2	B8	24"		15000 sccm 60 psig	30	(MO)	Q	NC	
HCV-383-4(SI)	Butterfly	CE-E-23866-210-130-1 of 2	B8	24"		15000 sccm 60 psig	30	(MO)	Q	NC	
HCV-2983(SI)	Globe	CE-E-23866-210-130-1 of 2	B1	2"	24150 sccm 350 psig	10000 sccm 60 psig	39	(AD)	Q	NO, FC	
SI-185(SI)	Globe	CE-E-23866-210-130-1 of 2	B1	2"	24150 sccm 350 psig	10000 sccm 60 psig	NA	(HO)	NA	LC	Ex
HCV-348(SI)	Gate	CE-E-23866-210-130-2 of 2	H6	12"		88000 sccm 60 psig	NA	(MO)	NA	LC	
HCV-2916(SI)	Globe	CE-E-23866-210-130-2 of 2	F3	1"	20400 sccm 2500 psig	10000 sccm 60 psig	12	(AD)	RO	NC, FC	Ex
HCV-2936(SI)	Globe	CE-E-23866-210-130-2 of 2	E3	1"	20400 sccm 250 psig	10000 sccm 60 psig	12	(AD)	RO	NC, FC	Ex

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CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-2956(SI)	Globe	CE-E-23866-210-130-2 of 2	A3	1"	20400 sccm 250 psig	10000 sccm 60 psig	12	(AD)	RO	NC, FC	Ex
HCV-2976(SI)	Globe	CE-E-23866-210-130-2 of 2	C3	1"	20400 sccm 250 psig	10000 sccm 60 psig	12	(AD)	RO	NC, FC	Ex
PCV-2909(SI)	Globe	CE-E-23866-210-130-2 of 2	F3	1"	64500 sccm 2500 psig	10000 sccm 60 psig	14	(AD)	Q	NC, FC	
PCV-2929(SI)	Globe	CE-E-23866-210-130-2 of 2	F3	1"	64500 sccm 2500 psig	10000 sccm 60 psig	14	(AD)	Q	NC, FC	
PCV-2949(SI)	Globe	CE-E-23866-210-130-2 of 2	A3	1"	64500 sccm 2500 psig	10000 sccm 60 psig	14	(AD)	Q	NC, FC	
PCV-2969(SI)	Globe	CE-E-23866-210-130-2 of 2	C3	1"	64500 sccm 2500 psig	10000 sccm 60 psig	14	(AD)	Q	NC, FC	
SI-194(SI)	Check	CE-E-23866-210-130-2 of 2	B5	6"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-195(SI)	Check	CE-E-23866-210-130-2 of 2	A6	2"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-197(SI)	Check	CE-E-23866-210-130-2 of 2	C5	6"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-198(SI)	Check	CE-E-23866-210-130-2 of 2	C6	2"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)

CATEGORY A VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Leakage Rate (Design)	Max. Leakage Rate (Test)	Max. Permissible Stroke Time Sec.	Max. Permissible Stroke Time (Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
SI-200(SI)	Check	CE-E-23866-210-130-2 of 2	E5	6"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-201(SI)	Check	CE-E-23866-210-130-2 of 2	E6	2"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-203(SI)	Check	CE-E-23866-210-130-2 of 2	G5	6"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-204(SI)	Check	CE-E-23866-210-130-2 of 2	F6	2"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-208(SI)	Check	CE-E-23866-210-130-2 of 2	B6	12"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-212(SI)	Check	CE-E-23866-210-130-2 of 2	D6	12"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-216(SI)	Check	CE-E-23866-210-130-2 of 2	E6	12"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)
SI-220(SI)	Check	CE-E-23866-210-130-2 of 2	G6	12"		1 gpm	NA	NA	RO	NC	Ex TS 2.1.1(12)

CATEGORY B VALVES

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-2506A(SL)	Gate	GHDR-11405-M-12	B2	.38"	3	(AD)	CS	NO, FC	Ex
HCV-2506B(SL)	Gate	GHDR-11405-M-12	B2	.38"	3	(AD)	CS	NO, FC	Ex
HCV-2507A(SL)	Gate	GHDR-11405-M-12	B3	.38"	3	(AD)	CS	NO, FC	Ex
HCV-2507B(SL)	Gate	GHDR-11405-M-12	B3	.38"	3	(AD)	CS	NO, FC	Ex
HCV-400A(AC)	Butter-fly	GHDR-11405-M-40	A2	8"	18	(AP)	CS	NO, FO	Ex
HCV-400B(AC)	Butter-fly	GHDR-11405-M-40	A3	8"	18	(AP)	CS	NO, FO	Ex
HCV-400C(AC)	Ball	GHDR-11405-M-40	D2	8"	18	(AP)	CS	NO, FO	Ex
HCV-400D(AC)	Butter-fly	GHDR-11405-M-40	D3	8"	18	(AP)	CS	NO, FO	Ex
HCV-401A(AC)	Butter-fly	GHDR-11405-M-40	B3	8"	18	(AP)	CS	NO, FO	Ex
HCV-401B(AC)	Butter-fly	GHDR-11405-M-40	B3	8"	18	(AP)	CS	NO, FO	Ex
HCV-401C(AC)	Ball	GHDR-11405-M-40	D2	8"	18	(AP)	CS	NO, FO	Ex
HCV-401D(AC)	Butter-fly	GHDR-11405-M-40	D3	8"	18	(AP)	CS	NO, FO	Ex

CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-402A(AC)	Butter-fly	GHDR-11405-M-40	B2	6"	18	(AP)	CS	NO, FO	Ex
HCV-402B(AC)	Butter-fly	GHDR-11405-M-40	B3	6"	18	(AP)	CS	NO, FO	Ex
HCV-402C(AC)	Ball	GHDR-11405-M-40	C2	6"	18	(AP)	CS	NO, FO	Ex
HCV-402D(AC)	Butter-fly	GHDR-11405-M-40	C3	6"	18	(AP)	CS	NO, FO	Ex
HCV-403A(AC)	Butter-fly	GHDR-11405-M-40	B2	6"	18	(AP)	CS	NO, FO	Ex
HCV-403B(AC)	Butter-fly	GHDR-11405-M-40	B3	6"	18	(AP)	CS	NO, FO	Ex
HCV-403C(AC)	Ball	GHDR-11405-M-40	C2	6"	18	(AP)	CS	NO, FO	Ex
HCV-403D(AC)	Butter-fly	GHDR-11405-M-40	C3	6"	18	(AP)	CS	NO, FO	Ex
HCV-2850(RW)	Butter-fly	GHDR-11405-M-100	A4	20"	18	(AP)	Q	NO, FO	
HCV-2851(RW)	Butter-fly	GHDR-11405-M-100	A4	20"	18	(AP)	Q	NO, FO	

CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-2852(RW)	Butter-fly	GHDR-11405-M-100	B4	20"	18	(AP)	Q	NO, FO	
HCV-2853(RW)	Butter-fly	GHDR-11405-M-100	B4	20"	18	(AP)	Q	NO, FO	
HCV-2880A(RW)	Butter-fly	GHDR-11405-M-100	D2	12"	18	(AP)	Q	NO, FO	
HCV-2880B(RW)	Butter-fly	GHDR-11405-M-100	E2	12"	45	(AP)	Q	NO, FO	
HCV-2881A(RW)	Butter-fly	GHDR-11405-M-100	D3	12"	18	(AP)	Q	NO, FO	
HCV-2881B(RW)	Butter-fly	GHDR-11405-M-100	E3	12"	45	(AP)	Q	NO, FO	
HCV-2882A(RW)	Butter-fly	GHDR-11405-M-100	D1	12"	18	(AP)	Q	NO, FO	
HCV-2882B(RW)	Butter-fly	GHDR-11405-M-100	E1	12"	45	(AP)	Q	NO, FO	
HCV-2883A(RW)	Butter-fly	GHDR-11405-M-100	D3	12"	18	(AP)	Q	NO, FO	
HCV-2883B(RW)	Butter-fly	GHDR-11405-M-100	E3	12"	45	(AP)	Q	NO, FO	

CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-1041A(MS)	Gate	GHDR-11405-M-252	B1	28"	4	(HP)	RO	NO, FO	Ex (TS 3.8)
HCV-1042A(MS)	Gate	GHDR-11405-M-252	B2	28"	4	(HP)	RO	NO, FO	Ex (TS 3.8)
HCV-1041C(MS)	Gate	GHDR-11405-M-252	B1		110	(MO)	CS	NC	Ex
HCV-1042C(MS)	Gate	GHDR-11405-M-252	B1		110	(MO)	CS	NC	Ex
YCV-1045(MS)	Gate	GHDR-11405-M-252	B3	2"	25	(AD)	Q	NC, FO	
YCV-1045A(MS)	Gate	GHDR-11405-M-252	B1	2"	25	(AD)	Q	NC, FO	
YCV-1045B(MS)	Gate	GHDR-11405-M-252	B1	2"	25	(AD)	Q	NC, FO	
HCV-1107A(FW)	Gate	GHDR-11405-M-253	B2	3"	60	(AD)	Q	NC, FO	
HCV-1107B(FW)	Gate	GHDR-11405-M-253	B2	3"	90	(AD)	Q	NC, FO	
HCV-1108A(FW)	Gate	GHDR-11405-M-253	B2	3"	60	(AD)	Q	NC, FO	
HCV-1108B(FW)	Gate	GHDR-11405-M-253	B2	3"	90	(AD)	Q	NC, FO	
HCV-1384(FW)	Gate	GHDR-11405-M-253	C3	4"	60	(MO)	Q	NC	
HCV-1385(FW)	Gate	GHDR-11405-M-253	C1	16"	30	(MO)	CS	NO	Ex
HCV-1386(FW)	Gate	GHDR-11405-M-253	B2	16"	30	(MO)	CS	NO	Ex
HCV-1387A(FW)	Gate	GHDR-11405-M-253	C2	2"	51	(AD)	CS	NO, FC	Ex

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CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-1387B(FW)	Gate	GHDR-11405-M-253	C2	2"	51	(AD)	CS	NO, FC	Ex
HCV-1388A(FW)	Gate	GHDR-11405-M-253	A2	2"	39	(AD)	CS	NO, FC	Ex
HCV-1388B(FW)	Gate	GHDR-11405-M-253	A2	2"	39	(AD)	CS	NO, FC	Ex
LCV-218-2(CH)	Gate	CE-E-23866-210-120-1 of 2	I4	4"	28	(MO)	RO	NO	Ex
HCV-238(CH)	Globe	CE-E-23866-210-120-1 of 2	A7	2"	48	(AD)	Q	NO, FO	
HCV-239(CH)	Globe	CE-E-23866-210-120-1 of 2	A7	2"	51	(AD)	Q	NO, FO	
HVC-240(CH)	Globe	CE-E-23866-210-120-1 of 2	A8	2"	50	(AD)	RO	NC, FC	Ex
HVC-247(CH)	Globe	CE-E-23866 210-120-1 of 2	B7	2"	NA	(SO)	Q	NO, FO	
HVC-248(CH)	Globe	CE-E-23866 210-120-1 of 2	B7	2"	NA	(SO)	Q	NO, FO	
HVC-249(CH)	Globe	CE-E-23866 210-120-1 of 2	A8	2"	NA	(SO)	RO	NC, FC	Ex
HCV-257(CH)	Globe	CE-E-23866 210-121	F4	2"	20	(AD)	Q	NO, FC	
HCV-258(CH)	Gate	CE-E-23866-210-121	E3	3"	46	(MO)	RO	NC	Ex

CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-264(CH)	Globe	CE-E-23866-210-121	F2	3"	20	(AD)	Q	NO, FC	
HCV-265(CH)	Gate	CE-E-23866-210-121	E2	3"	46	(MO)	RO	NC	Ex
HCV-268(CH)	Gate	CE-E-23866-210-121	B6	3"	24	(MO)	RO	NC	Ex
FCV-269(CH)	Globe	CE-E-23866-210-121	C7	4"	6	(AD)	Q	NC, FC	
LCV-383-1(SI)	Butter-fly	CE-E-23866-210-130-1 of 2	H3	20"	30	(AP)	Q	NO, FO	
LCV-383-2(SI)	Butter-fly	CE-E-23866-210-130-1 of 2	H2	20"	30	(AP)	Q	NO, FO	
HCV-344(SI)	Globe	CE-E-23866-210-130-1 of 2	B3	8"	140	(AP)	RO	NC, FO	Ex
HCV-345(SI)	Globe	CE-E-23866-210-130-1 of 2	B4	8"	140	(AP)	RO	NC, FO	Ex
HCV-385(SI)	Globe	CE-E-23866-210-130-1 of 2	F1	4"	72	(AD)	Q	NO, FO	
HCV-386(SI)	Globe	CE-E-23866-210-130-1 of 2	G1	4"	72	(AD)	Q	NO, FO	
HCV-311(SI)	Globe	CE-E-23866-210-130-2 of 2	F6	2"	12	(MO)	Q	NC	
HCV-312(SI)	Globe	CE-E-23866-210-130-2 of 2	F6	2"	12	(MO)	Q	NC	

CATEGORY B VALVES (Cont'd)

Valve Number (System)	Valve Type	P&ID Number	P&ID Location	Size	Max. Permissible Stroke Time Sec.	(Oper.)	Exercise Test Schedule	Nor. Pos., Failure Mode	Exceptions (Refer to Appendix 2C)
HCV-314(SI)	Globe	CE-E-23866-210-130-2 of 2	E6	2"	12	(MO)	Q	NC	
HCV-315(SI)	Globe	CE-E-23866-210-130-2 of 2	E6	2"	12	(MO)	Q	NC	
HCV-317(SI)	Globe	CE-E-23866-210-130-2 of 2	A6	2"	12	(MO)	Q	NC	
HCV-318(SI)	Globe	CE-E-23866-210-130-2-2 of 2	A6	2"	12	(MO)	Q	NC	
HCV-320(SI)	Globe	CE-E-23866-210-130-2 of 2	C6	2"	12	(MO)	Q	NC	
HCV-321(SI)	Globe	CE-E-23866-210-130-2 of 2	C6	2"	12	(MO)	Q	NC	
HCV-327(SI)	Globe	CE-E-23866-210-130-2 of 2	G6	4"	12	(MO)	Q	NC	
HCV-329(SI)	Globe	CE-E-23866-210-130-2 of 2	E6	4"	12	(MO)	Q	NC	
HCV-331(SI)	Globe	CE-E-23866-210-130-2 of 2	B6	4"	12	(MO)	Q	NC	
HCV-333(SI)	Globe	CE-E-23866-210-130-2 of 2	C6	4"	12	(MO)	Q	NC	
HCV-864(CS)	Gate	CE-E-23866-210-130-2 of 2	H2	4"	NA	(AD)	Q	NC,FC	
HCV-865(CS)	Gate	CE-E-23866 210-130-2 of 2	H4	4"	NA	(AD)	Q	NC,FC	

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CATEGORY C VALVES

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
AC-101	Check	GHDR-11405-M-10	D2	12"	NO	Q	Ex
AC-104	Check	GHDR-11405-M-10	C2	12"	NO	Q	Ex
AC-107	Check	GHDR-11405-M-10	B2	12"	NO	Q	Ex
RW-115	Check	GHDR-11405-M-100	B4	20"	NO	Q	Ex
RW-117	Check	GHDR-11405-M-100	B4	20"	NO	Q	Ex
RW-121	Check	GHDR-11405-M-100	A4	20"	NO	Q	Ex
RW-125	Check	GHDR-11405-M-100	A4	20"	NO	Q	Ex
MS-275	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-276	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-277	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-278	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-279	Relief	GHDR-11405-M-252	A2	2.5"	NC	Table IWV-3510-1	
MS-280	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	

CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
MS-281	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-282	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-291	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
MS-292	Relief	GHDR-11405-M-252	A1	2.5"	NC	Table IWV-3510-1	
FW-161	Check	GHDR-11405-M-253	C1	16"	NO	RO, CS	Ex
FW-162	Check	GHDR-11405-M-253	B1	16"	NO	RO, CS	Ex
FW-163	Check	GHDR-11405-M-253	B2	3"	NC	CS	Ex
FW-164	Check	GHDR-11405-M-253	B2	3"	NC	CS	Ex
FW-173	Check	GHDR-11405-M-253	C5	4"	NC	Q	
FW-174	Check	GHDR-11405-M-253	D5	4"	NC	Q	
FW-658	Vacuum Breaker	GHDR-11405-M-254	B5	1.5"	NC	Q	
RC-141	Relief	CE-E-23866-210-110	G6	3"	NC	RO	
RC-142	Relief	CE-E-23866-210-110	G5	3"	NC	RO	

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CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
CH-159	Relief	CE-E-23866-210-120-1 of 2	H3	1"	NC	RO	
CH-181	Relief	CE-E-23866-210-120-1 of 2	F5	1.5"	NC	RO	
CH-182	Relief	CE-E-23866-210-120-1 of 2	E4	1.5"	NC	RO	
CH-183	Relief	CE-E-23866-210-120-1 of 2	E6	1.5"	NC	RO	
CH-198	Check	CE-E-23866-210-120-1 of 2	C7	2"	NC	RO	Ex
CH-129	Check	CE-E-23866-210-121	C4	3"	NC	Q	
CH-130	Check	CE-E-23866-210-121	D5	3"	NC	Q	
CH-143	Check	CE-E-23866-210-121	B7	3"	NC	RO	Ex
CH-155	Check	CE-E-23866-210-121	B7	3"	NC	RO	Ex

CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
CH-151	Check	CE-E-23866-210-121	C7	3"	NC	Q	
CH-335	Relief	CE-E-23866-210-121	C5	.75"	NC	RO	
CH-338	Relief	CE-E-23866-210-121	D7	.75"	NC	RO	
SI-100	Check	CE-E-23866-210-130-1 of 2	H7	6"	NC	P-Q/F-RO	Ex
SI-113	Check	CE-E-23866-210-130-1 of 2	H6	8"	NC	P-Q/F-RO	Ex
SI-102	Check	CE-E-23866-210-130-1 of 2	F7	4"	NC	RO	Ex
SI-108	Check	CE-E-23866-210-130-1 of 2	F6	4"	NC	RO	Ex
SI-115	Check	CE-E-23866-210-130-1 of 2	F6	4"	NC	RO	Ex
SI-121	Check	CE-E-23866-210-130-1 of 2	F5	8"	NC	RO	Ex
SI-129	Check	CE-E-23866-210-130-1 of 2	F4	8"	NC	RO	Ex

CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
SI-135	Check	CE-E-23866-210-130-1 of 2	F3	8"	NC	RO	Ex
SI-143	Check	CE-E-23866-210-130-1 of 2	F2	8"	NC	RO	Ex
SI-149	Check	CE-E-23866-210-130-1 of 2	F2	8"	NC	RO	Ex
SI-139	Check	CE-E-23866-210-130-1 of 2	H2	20"	NC	P-Q/F-RO	Ex
SI-140	Check	CE-E-23866-210-130-1 of 2	H3	20"	NC	P-Q/F-RO	Ex
SI-159	Check	CE-E-23866-210-130-1 of 2	C8	24"	NC	See Exemption Request	Ex
SI-160	Check	CE-E-23866-210-130-1 of 2	C8	24"	NC	See Exemption Request	Ex
SI-175	Check	CE-E-23866-210-130-2 of 2	I4	12"	NC	RO	Ex
SI-176	Check	CE-E-23866-210-130-2 of 2	I2	12"	NC	RO	Ex
SI-196	Check	CE-E-23866-210-130-2 of 2	A6	2"	NC	RO	Ex

CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
SI-199	Check	CE-E-23866-210-130-2 of 2	C6	2"	NC	RO	Ex
SI-202	Check	CE-E-23866-210-130-2 of 2	E6	2"	NC	RO	Ex
SI-205	Check	CE-E-23866-210-130-2 of 2	F6	2"	NC	RO	Ex
SI-207	Check	CE-E-23866-210-130-2 of 2	B4	12"	NC	RO	Ex
SI-211	Check	CE-E-23866-210-130-2 of 2	D4	12"	NC	RO	Ex
SI-215	Check	CE-E-23866-210-130-2 of 2	E4	12"	NC	RO	Ex
SI-219	Check	CE-E-23866-210-130-2 of 2	G4	12"	NC	RO	Ex
SI-298	Relief	CE-E-23866-210-130-1 of 2	D3	1"	NC	Table IWV-3510-1	
SI-299	Relief	CE-E-23866-210-130-1 of 2	D4	1"	NC	Table IWV-3510-1	
SI-209	Relief	CE-E-23866-210-130-2 of 2	D1	1"	NC	Table IWV-3510-1	

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CATEGORY C VALVES (Cont'd)

Valve Number	Valve Type	P&ID Number	P&ID Location	Size	Normal Position	Test Frequency	Exceptions (Refer to Appendix 2C)
SI-213	Relief	CE-E-23866-210-130-2 of 2	B1	1"	NC	Table IWV-3510-1	
SI-217	Relief	CE-E-23866-210-130-2 of 2	E1	1"	NC	Table IWV-3510-1	
SI-221	Relief	CE-E-23866-210-130-2 of 2	G1	1"	NC	Table IWV-3510-1	