OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

INSERVICE INSPECTION PROGRAM PLAN FOR THE 1993-2003 INTERVAL

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INTRODUCTION

This report defines the Fort Calhoun Station Inservice Inspection (ISI) Program Plan for Class 1, Class 2, and Class 3 pressure retaining components for the ten year (120 month) interval from September 26, 1993, to September 25, 2003. This report also covers Class 1, Class 2, and Class 3 pump and valve Inservice Testing (IST) for the ten year (120 month) interval from September 26, 1993, to September 25, 2003.

This program has been developed as required by Section 50.55a of 10CFR Part 50 following the guidance of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI (hereinafter called Section XI), "*Rules for Inservice Inspection of Nuclear Power Plant Components*", and the ASME/ANSI Operation and Maintenance of Nuclear Power Plants manual (hereinafter called O&M Manual) Parts 1, 6, and 10, and the NRC Generic Letter 89-04, dated April 3, 1989. The ISI Program Plan is controlled by the Fort Calhoun Station Unit 1 Technical Specifications 3.3.(1)a.

This program is in compliance, where possible, with the applicable requirements of ASME Section XI, 1989 Edition (Program B) and the ASME/ANSI O&M Manual Parts 1, 6, and 10, 1987 Edition, 1988 Addenda, except as noted below:

> The O&M Manual, Part 6, 1987 Edition and 1988 Addenda have omitted the Figure 1 referred to on Table 3, Note 2 for vibration ranges. OPPD will use the Table 3 as listed in the 1989 addenda of the O&M Manual, Part 6 for vibration ranges for test parameters.

This program incorporates the results of previous inservice and preservice inspections. It is the intent of the Licensee (Omaha Public Power District) to continue to review and apply, as appropriate, changes in the ASME Section XI Code that would improve the total ISI Program Plan, pursuant to 10CFR50.55a.

Revision 1 of this program plan incorporates changes to the ISI Program (Part 1) as requested by the NRC.

Revision 2 of this program plan incorporates resolutions to the NRC Safety Evaluation Report (SER) anomalies identified in Part 4, Reference 7 of this program plan as well as typographical errors and changes due to Engineering Change Notices (ECNs)/Modifications (Mods) at FCS.

PART 1: CLASS 1, CLASS 2, AND CLASS 3 PRESSURE RETAINING COMPONENTS

1.0 Program Summary

1.1 The Inservice Inspection (ISI) Program for Class 1, 2, and 3 pressure retaining components was developed in accordance with, and meets the requirements of, the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition. The ISI Program for Class 1, 2, and 3 pressure retaining components will remain in effect for the remainder of the ten year (120 month) interval, which commences on September 26, 1993. The Program will be reviewed and updated as required by the edition of the Code and Addenda in effect not more than 12 months prior to the start of the next (i.e., fourth) 120 month interval (beginning September 26, 2003).

2.0 Scope and Responsibility

2.1 The Piping and Instrumentation Drawings (P&IDs) for Fort Calhoun Station (FCS) identify the class boundaries. These P&IDs are subject to review and are changed as required in accordance with FCS administrative procedures.

2.2 Class 1, Class 2, and Class 3 components and the methods of examination for each component are listed in Tables 1.1, 1.2, and 1.3, respectively. The total number of Class 1, 2, and 3 components and supports required by ASME Section XI 1989 Edition, no Addenda, are listed by category in Tables 1B, 1C, and 1D respectively. The required number of exams per category per forty (40) month period are also shown, as well as a proposed exam schedule per category per forty (40) month period. The specific components to be examined for each class shall be identified in the Fort Calhoun Station Unit 1 Ten Year Inservice Examination Plan by title and/or number. Exceptions to compliance with Subsection IWA, Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1 of Section XI are listed in Appendices 1A, 1B, 1C, and 1D, respectively.

> Class 3 portions of the Waste Disposal System have been classified as Class 3 in accordance with Subarticle IWA-1320, Paragraph (e) of Section XI. Examination in accordance with the rules of Subsection IWD will not be performed on the Class 3 portion of the Waste Disposal System. (Although the Waste Disposal System at FCS is classified Class 3, it is not considered safety related as required for inspection per IWD-2500.)

2.3 Class 1, Class 2, and Class 3 component supports and the methods of examination for each support are listed in Table 1.4.

2.4 Steam Generator, safety-related snubbers, metallic liners (of Class CC), containment spray nozzles and the concrete component examinations (Class CC) are not performed under this ISI Program Plan, but are performed as described below:

2.4.1 Steam Generator exams are performed under FCS Technical Specification 3.17.

2.4.2 Snubber exams are performed under FCS Technical Specification 3.14 and OM Code ISTD 1990, 1992 Addenda. Reference NRC letter dated April 6, 1995 (NRC 95-071).

2.4.3 Metallic liner exams (of Class CC) are not required at the time of this submittal per 10CFR50.

2.4.4 Concrete component exams are performed under FCS Technical Specification 3.5.

2.5 The containment spray nozzles are tested under FCS Technical Specification 3.6.

3.0 Inspection Intervals

3.1 The inspection intervals for Class 1, Class 2, and Class 3 components are ten year (120 month) intervals of service which commenced on September 26, 1973. This program plan covers the third ten year interval, i.e. September 26, 1993 to September 25, 2003.

The ten year Inservice Examination Plan describes the distribution of examinations within the inspection intervals in accordance with IWB-2400, IWC-2400, IWD-2400 and IWF-2400 of Section XI.

3.2 The inspection intervals and periods may be extended by as much as one year to permit inspections to be concurrent with plant outages as permitted by IWA-2430(d) of Section XI.

3.3 Selection of Class 1 pressure retaining piping welds for examination shall be in accordance with the requirements of the 1974 Edition of Section XI, Summer of 1975 Addenda. [As permitted by 10CFR50.55a(b)(2)(ii)]

4.0 Examination Categories

4.1 Class 1 components, as described in the ten-year examination plan, will be examined to the extent and frequency required by Table IWB-2500-1 of Section XI (except as noted in Appendix 1B).

4.2 Class 2 components as described in the ten-year examination plan will be examined to the extent and frequency required by Table IWC-2500-1 of Section XI (except as noted in Appendix 1C).

4.3 Class 3 components, as described in the ten year examination plan, shall be examined to the extent and frequency as required by Table

IWD-2500-1 of Section XI (except as noted in Appendix 1D).

5.0 Examination Methods

5.1 Class 1 and Class 2 components shall be examined by the required visual, surface, and volumetric examination methods. 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 (UT) examinations shall be performed in accordance with the following:

5.1.1 When listing calibration blocks on piping reports, the block thickness shall be within ±25% of the pipe wall thickness examined per the rules of Code Case N-461.

5.1.2 The reactor coolant pumps (RCP) shall be examined per the rules of ASME Code Cases N-481 and N-498-1.

5.2 Class 3 components shall be visually examined for leakage in accordance with Article IWD-2500 of Section XI.

6.0 Evaluation of Examination Results

6.1 Class 1 Components

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.

6.2 Class 2 Components

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.

6.3 Class 3 Components

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

6.4 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.

7.0 Repair Requirements

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

7.2 Surface defects in Class 1 and Class 2 pressure retaining components may be removed by mechanical means when the removal of a defect will not alter the basic configurations of the item. Pressure retaining components that have defects that cannot be removed by mechanical means will be replaced in accordance with Article IWA-7000 of Section XI, or monitored for further growth per IWB-2420 or IWC-2420.

8.0 System Pressure Testing

8.1 General Requirements

8.1.1 System pressure tests will be conducted in accordance with Article IWA-5000 of Section XI and ASME Code Case N-498.

8.1.2 Evaluation of any corroded area will be performed in accordance with Section XI.

8.1.3 Repairs of corroded areas shall be performed in accordance with Section 7 of this Program.

8.2 Class 1 Components

8.2.1 After each Refueling Outage, the system will be leak tested in accordance with Article IWB-5000 of Section XI and in accordance with FCS Technical Specification 2.1 (Figures 2-1A and 2-1B).

8.2.2 The ten year hydrostatic tests for ASME Class 1 systems will not be performed in the ISI Program. In lieu of the hydrostatic tests required by ASME Section XI, alternative testing consisting of system pressure and leakage tests as described in ASME Code Case N-498-1 will be performed. Refer to ASME Code Case N-498-1, dated May 11, 1994, and NRC letter dated January 30, 1995 (NRC-95-017).

8.2.3 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.

8.3 Class 2 Components

8.3.1 Pressure tests and visual examination of Class 2 components will be performed in accordance with the guidelines of Table IWC-2500 of Section XI.

8.3.2 The ten year hydrostatic tests for ASME Class 2 systems will not be performed in the ISI Program. In lieu of the hydrostatic tests required by Section XI, alternative testing consisting of system pressure and leakage tests as described in ASME Code Case N-498-1, will be performed. Refer to ASME Code Case N-498-1, dated May 11, 1994, and NRC letter dated January 30, 1995 (NRC-95-017).

8.3.3 System leakage tests will be used in lieu of required hydrostatic tests for repairs/replacements of Class 2 components/piping at the discretion of the ISI Coordinator and ANII in accordance with ASME Code Case N-416. The required hydrostatic tests will be performed at the next regularly scheduled Refueling Outage.

8.4 Class 3 Components

8.4.1 Pressure tests and visual examination of Class 3 components will be performed in accordance with the guidelines of Table IWD-2500 of Section XI.

8.4.2 The ten year hydrostatic tests for ASME Class 3 systems will not be performed in the ISI Program. In lieu of the hydrostatic tests required by Section XI, alternative testing consisting of system pressure and leakage tests as described in ASME Code Case N-498-1, will be performed. Refer to ASME Code Case N-498-1, dated May 11, 1994, and NRC letter dated January 30, 1995 (NRC-95-017).

9.0 **Records and Reports**

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

TABLES

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	Volumetric
B1.20	B-A	Circumferential and meridional head welds (accessible length)	Volumetric
B1.30	B-A	Shell-to-flange welds	Volumetric
B1.40	B-A	Head-to-flange weld	Volumetric & Surface
B3.90	B-D	Nozzle-to-vessel welds	Volumetric
B3.100	B-D	Nozzle inside radius section	Volumetric
B4.10	B-E	Partial penetration welds, including vessel nozzles, control rod drive nozzles & instrumentation nozzles	Visual, VT-2
B5.10	B-F	Nozzle-to-safe end butt welds NPS 4 or larger	Volumetric & Surface
B6.10	B-G-1	Closure head nuts	Surface
B6.30	B-G-1	Closure studs, when removed	Volumetric & Surface
B6.40	B-G-1	Threads in flange	Volumetric
B6.50	B-G-1	Closure washers	Visual, VT-1
B7.80	B-G-2	Bolts, studs & nut $\leq$2 in. diameter in CRD housing	Visual, VT-1
B13.10	B-N-1	Vessel interior	Visual, VT-3
B13.50	B-N-2	Interior attachments within beltline region	Visual, VT-1
B13.60	B-N-2	Interior attachments beyond beltline region	Visual, VT-3
B13.70	B-N-3	Core support structure	Visual, VT-3
B14.10	B-O	Pressure retaining welds in Control rod drive housings	Surface or Volumetric
B15.10	B-P	Pressure retaining boundary	Visual, VT-2
B15.11	B-P	Pressure retaining boundary	Visual, VT-2

TABLE 1.1 (Continued)

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

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Pressurizer	
B2.10	B-B	Longitudinal and circumferential shell-to-head welds	Volumetric
B3.110	B-D	Nozzle-to-vessel welds	Volumetric
B3.120	B-D	Nozzle inside radius section	Volumetric
B4.20	B-E	Heater penetration welds	Visual, VT-2
B5.40	B-F	Nozzle-to-safe end welds NPS 4 or larger	Volumetric & Surface
B5.50	B-F	Nozzle-to-safe end NPS less than 4	Surface
B7.20	B-G-2	Bolts, studs and nuts $\leq$2 in. diameter	Visual, VT-1
B10.10	B-K-1	Integrally welded attachments	Surface or Volumetric
B15.20	B-P	Pressure retaining boundary	Visual, VT-2
B15.21	B-P	Pressure retaining boundary	Visual, VT-2
		Steam Generators (Primary Side)	
B2.30	B-B	Head welds, circumferential and meridional	Volumetric
B2.40	B-B	Tubesheet-to-head weld	Volumetric
B3.130	B-D	Nozzle-to-vessel welds	Volumetric
B3.140	B-D	Nozzle inside radius section	Volumetric
B5.70	B-F	Nozzle-to-safe end welds NPS 4 or larger	Volumetric & Surface
B7.30	B-G-2	Bolts, studs, and nuts $\leq$2 in. diameter	Visual, VT-1
B10.10	B-K-1	Integrally welded attachments	Surface or Volumetric
B15.30	B-P	Pressure retaining boundary	Visual, VT-2
B15.31	B-P	Pressure retaining boundary	Visual, VT-2
		Heat Exchanger	
B2.50	B-B	Head welds, circumferential and meridional	Volumetric

TABLE 1.1 (Continued)

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

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Heat Exchanger (Continued)	
B2.70	B-B	Longitudinal welds	Volumetric
B2.80	B-B	Tubesheet-to-shell welds	Volumetric
B3.150	B-D	Nozzle-to-vessel welds	Volumetric
B3.160*	B-D	Nozzle inside radius section	Volumetric
B15.40	B-P	Pressure retaining boundary	Visual, VT-2
B15.41	B-P	Pressure retaining boundary	Visual, VT-2
		Piping Pressure Boundary	
B5.130	B-F	NPS 4 or larger dissimilar metal butt welds	Surface & Volumetric
B5.140	B-F	Less than NPS 4 dissimilar metal butt welds	Surface
B7.50	B-G-2	Bolts, studs and nuts ≤2 in. diameter	Visual, VT-1
B9.10	B-J	Circumferential welds & longitudinal welds NPS 4 or larger	Surface & Volumetric
B9.20	B-J	Circumferential & longitudinal welds less than NPS 4	Surface
B9.31	B-J	Branch pipe connection welds nominal pipe size NPS 4 or larger	Surface & Volumetric
B9.32	B-J	Branch pipe connection welds nominal pipe size less than NPS 4	Surface
B9.40	B-J	Socket welds	Surface
B10.?0	B-K-1	Integrally welded attachments	Surface or Volumetric
B15.50	B-P	Pressure retaining boundary	Visual, VT-2
B15.51	B-P	Pressure retaining boundary	Visual, VT-2
		Pump Pressure Boundary	
B6.180	B-G-1	Bolts and studs >2 in. diameter	Volumetric

* See Appendix 1B

TABLE 1.1 (Continued)

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

ITEM NO.	EXAMINATION CATEGORY TABLE IWB-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Pump Pressure Boundary (Continued)	
B6.190	B-G-1	Flange surface when disassembled (with >2 in. bolting or studs)	Visual, VT-1
B6.200	B-G-1	Nuts, bushings, and washers >2 in.	Visual, VT-1
B7.60	B-G-2	Bolts, studs, and nuts ≤2 in.	Visual, VT-1
B10.30	B-K-1	Integrally welded attachments	Surface or Volumetric
B12.10	B-L-1	Pump casing welds	*Visual, VT-1
B12.20	B-L-2	Pump casings	Visual, VT-3
B15.60	B-P	Pressure retaining boundary	Visual, VT-2
B15.61	B-P	Pressure retaining boundary	Visual, VT-2
		Valve Pressure Boundary	
B7.70	B-G-2	Bolts, studs, and nuts ≤2 in. diameter	Visual, VT-1
B12.30	B-M-1	Valve body welds less than NPS 4	Surface
B12.40	B-M-1	Valve body welds NPS 4 or larger	Volumetric
B12.50	B-M-2	Valve body exceeding NPS 4	Visual, VT-3
B15.70	B-P	Pressure retaining boundary	Visual, VT-2
B15.71	B-P	Pressure retaining boundary	Visual, VT-2

* Per Code Case N-481

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	Tubesheet-to-shell weld	Volumetric
C2.21	C-B	Nozzle-to-shell (or head) weld in vessels >½ in. nominal thickness without reinforcing plate	Surface & Volumetric
C2.22	C-B	Nozzle inside radius in vessels >½ in. nominal thickness without reinforcing plate	Volumetric
C7.10	C-H	Pressure retaining boundary	Visual, VT-2
C7.20	C-H	Pressure retaining boundary	Visual, VT-2
		All Piping	
C3.10	C-C	Integrally welded attachments (Pressure Vessels)	Surface
C3.20	C-C	Integrally welded attachments (Piping)	Surface
C7.30	C-H	Pressure retaining boundary	Visual, VT-2
C7.40	C-H	Pressure retaining boundary	Visual, VT-2
		Austenitic Stainless Steel or High Alloy Piping	
C5.10	C-F-1	Circumferential & longitudinal welds ≥⅜ in. nominal wall thickness for piping > NPS 4	Surface & Volumetric
C5.20	C-F-1	Circumferential & longitudinal welds >1/5 in. nominal wall thickness for piping ≥ NPS 2 and ≤ NPS 4	Surface & Volumetric
C5.30	C-F-1	Socket welds	Surface
C5.40	C-F-1	Circumferential & longitudinal welds in pipe branch connections of branch piping ≥ NPS 2	Surface
C5.50	C-F-2	Circumferential & longitudinal welds ≥⅜ in. nominal wall thickness for piping > NPS 4	Surface & Volumetric

TABLE 1.2 (Continued)

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

ITEM NO.	EXAMINATION CATEGORY TABLE IWC-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
		Austenitic Stainless Steel or High Alloy Piping (Continued)	
C5.60	C-F-2	Circumferential & longitudinal welds >1/5 in. nominal wall thickness for piping ≥ NPS 2 and ≤ NPS 4	Surface & Volumetric
C5.70	C-F-2	Socket welds	Surface
C5.80*	C-F-2	Circumferential and longitudinal welds in pipe branch connections of branch piping ≥ NPS 2	Surface
		Pumps	
C6.10	C-G	Pump casing welds	Surface
C7.50	C-H	Pressure retaining components	Visual, VT-2
C7.60	C-H	Pressure retaining components	Visual, VT-2
		Valves	
C6.20	C-G	Valve body welds	Surface
C7.70	C-H	Pressure retaining components	Visual, VT-2
C7.80	C-H	Pressure retaining components	Visual, VT-2

* See Appendix 1C

TABLE 1.3

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

ITEM NO.	EXAMINATION CATEGORY TABLE IWD-2500-1	COMPONENTS AND PARTS TO BE EXAMINED	METHOD
D1.10	D-A	Pressure retaining components	Visual, VT-2
D1.20	D-A	Integral attachment, component supports and restraints	Visual, VT-3
D1.30	D-A	Integral attachment, mechanical and hydraulic snubbers	Visual, VT-3
D1.40	D-A	Integral attachment, spring type supports	Visual, VT-3
D1.50	D-A	Integral attachment, constant load type supports	Visual, VT-3
D1.60	D-A	Integral attachment, shock absorbers	Visual, VT-3

TABLE 1.4

COMPONENTS, PARTS, AND METHODS OF EXAMINATION IWF-2500

CODE CASE N-491 ALTERNATIVE RULES FOR EXAMINATION OF CLASS 1, 2, 3 AND METAL CONTAINMENT COMPONENT SUPPORTS OF LIGHT-WATER COOLED POWER PLANTS

ITEM NO.	EXAMINATION CATEGORY TABLE IWF-2500	SUPPORT TYPE EXAMINED	METHOD
F1.10	F-A	Class 1 piping supports	Visual, VT-3
F1.20	F-A	Class 2 piping supports	Visual, VT-3
F1.30	F-A	Class 3 piping supports	Visual, VT-3
F1.40	F-A	Supports other than piping supports (Class 1, 2, 3 and MC)	Visual, VT-3

PART 1

APPENDICES

APPENDIX 1A

EXCEPTIONS TO COMPLIANCE WITH SUBSECTION IWA

Section	Exception
IWA-2600	Weld identifications will be marked at the time the weld is examined per Station Engineering Instruction SEI-27.

APPENDIX 1B

EXCEPTIONS TO COMPLIANCE WITH TABLE IWB-2500-1 (CLASS 1 COMPONENTS) IN ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI, 1989 EDITION

Item No.	Exception
B1.10	The Reactor Pressure Vessel (RPV) Shell Welds are limited to automated examinations from the RPV interior due to dose and accessibility of the exterior surface. The beltline circumferential weld (RPV-SC-C-11) and the three lower shell longitudinal welds' (RPV-SL-A-3, RPV-SL-B-3, RPV-SL-C-3) interior scanning surfaces are limited by the proximity on the six RPV surveillance capsule holders located at 45°, 85°, 95°, 225°, 265, and 275°. The Code required exam volume cannot be met on these welds and a relief request has been submitted.
B1.30	The RPV upper shell-to-flange weld (RPV-A-11) is limited to a manual examination from the flange surface and an automated examination from the RPV interior, due to dose and accessibility of the exterior surface and to the geometry of the RPV. The Code required exam volume cannot be met on this weld and relief is included in the above mentioned relief request.

APPENDIX 1C

EXCEPTIONS TO COMPLIANCE WITH TABLE IWC-2500-1

Item No.	Exception
	None

Substitute Examinations for Table IWC-2500-1

C5.81 The following are inaccessible branch connection welds due to cable wrapping which holds a system of heavy metal slats in place over the main steam piping in Room 81.

ISO #	Component
B-04	28-MS-2001/12-BC-1
	28-MS-2001/12-BC-2
	28-MS-2001/15-BC-1
	28-MS-2001/15-BC-2
B-06	28-MS-2002/12-BC-1
	28-MS-2002/12-BC-2
	28-MS-2002/15-BC-1
	28-MS-2002/15-BC-3

The Fort Calhoun Updated Safety Analysis Report (USAR), Appendix M, Section 3.5.8 states:

> "A protective enclosure (has been) provided around the main steam and feedwater lines between the penetration sleeves and the first isolation valves, where a large rupture is postulated.
>
> This enclosure, although designed primarily to limit the effects of jet impingement, also serves to minimize the reaction effects of a longitudinal rupture by containing the jet and preventing the formation of an unbalanced external force."

In the past, the NRC has conducted a review of the piping exam areas (Docket 50-285, November 10, 1986) and determined that the required examinations were impractical to perform.

Since one of the eight branch connection welds listed above is required by ASME Section XI, OPPD will substitute a similar branch connection weld on the non-class portion of the main steam line shown on isometric B-86.

The Code required IWA-5000 system leakage test monitors all the cable wrapped welds.

APPENDIX 1D

EXCEPTIONS TO COMPLIANCE WITH TABLE IWD-2500-1

Item No.	Exception
	None

SUMMARY

TABLES

TABLE 1A

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TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-A PRESSURE RETAINING WELDS IN RPV										
B-A	B1.10	RPV SHELL WELDS								
B-A	B1.11	CIRCUMFERENTIAL	VOL	ALL WELDS	YES	3	3	-	-	3
B-A	B1.12	LONGITUDINAL	VOL	ALL WELDS	YES	9	9	-	-	9
B-A	B1.20	RPV HEAD WELDS								
B-A	B1.21	CIRCUMFERENTIAL	VOL	ACCES. LENGTH ALL WELDS	YES	2	2	-	-	2
B-A	B1.22	MERIDIONAL	VOL	ACCES. LENGTH ALL WELDS	YES	12	12	-	-	12
B-A	B1.30	RPV SHELL-FLANGE WELD	VOL	FLANGE FACE 1ST PERIOD	PART.	1	1	PARTIAL	-	1
B-A	B1.40	RPV HEAD-FLANGE WELD	SUR/VOL	FLANGE FACE 1ST PERIOD	PART.	1	1	PARTIAL	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						28	28	2 PARTIAL	-	28
TOTAL NUMBER OF EXAMS ACCUMULATED										
REQUIRED ACCUMULATED NUMBER PER PERIOD								2 PARTIAL	-	28
B-B PRESSURE RETAINING WELDS IN VESSELS OTHER RPV										
B-B	B2.10	PZR SHELL-HEAD WELDS								
B-B	B2.11	CIRCUMFERENTIAL	VOL	ALL WELDS	NO	2	2	1 (UPPER)	-	1 (LOWER)
B-B	B2.12	LONGITUDINAL	VOL	1' OF WELD INTERSECTING B2.11 WELD	NO	4	2	1 (UPPER)	-	1 (LOWER)
B-B	B2.20	HEAD WELDS	N/A	ONE PIECE HEADS				-	-	-
B-B	B2.30	SG HEAD WELDS								

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-B	B2.31	CIRCUMFERENTIAL	VOL	1 WELD PER HEAD	NO	4	1	-	1	-
B-B	B2.32	MERIDIONAL	VOL	1 WELD PER HEAD	NO	8	1	-	1	-
B-B	B2.40	TUBESHEET-HEAD WELD	VOL	WELD	NO	2	1	-	1	-
B-B	B2.50	HX SHELL (OR HEAD) WELDS								
B-B	B2.51	CIRCUMFERENTIAL (RGHX)	VOL	1 WELD PER HEAD	NO	2	1	-	-	1
B-B	B2.70	LONGITUDINAL (RGHX)	VOL	ENTIRE WELD	NO	2	1	-	-	1
B-B	B2.80	TUBESHEET-SHELL WELD (RGHX)	VOL	WELD	NO	2	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						26	10	2	3	5
TOTAL NUMBER OF EXAMS ACCUMULATED								2	5	10
REQUIRED ACCUMULATED NUMBER PER PERIOD								2 - 3	5 - 6	10
B-D FULL PENETRATION WELD OF NOZZLES IN VESSELS										
B-D	B3.90	RPV NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	PART.	6	6	-	-	6
B-D	B3.100	RPV NOZZLE INNER RADIUS	VOL	ALL NOZZLES	NO	6	6	-	-	6
B-D	B3.110	PRZ NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	NO	5	5	2	3	-
B-D	B3.120	PRZ NOZZLE-INNER RADIUS	VOL	ALL NOZZLES	NO	5	5	2	3	-
B-D	B3.130	SG NOZZLE-VESSEL WELDS	VOL	ALL NOZZLES	NO	6	6	3 (LOOP A)	3 (LOOP B)	-
B-D	B3.140	SG NOZZLE-INNER RADIUS	VOL	ALL NOZZLES	NO	6	6	3 (LOOP A)	3 (LOOP B)	-
B-D	B3.150	HX NOZZLE-VESSEL WELDS (RGHX)	VOL	ALL NOZZLES	NO	4	4	2	-	2

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-D	B3.160	HX NOZZLE-INNER RADIUS (RGHX)	VOL	ALL NOZZLES	NO	4	4	2	-	2
TOTAL NUMBER OF EXAMS PER COLUMN						42	42	14	12	16
TOTAL NUMBER OF EXAMS ACCUMULATED								14	24	42
REQUIRED ACCUMULATION PER PERIOD *NOTE: SECTION XI CAT. B-D NOTE 2 REQUIRES 25% - 50% IN FIRST PERIOD								*11 - 21	21 - 29	42
B-E PRESSURE RETAINING PARTIAL PENETRATION WELDS IN VESSELS			ALL EXAMS PERFORMED UNDER PROCEDURE OP-ST-RC-3007					-	-	-
B-F PRESSURE RETAINING DISSIMILAR METAL WELDS										
B-F	B5.10	RPV NOZ-SAFEEND ≥4"	SUR/VOL	ALL WELDS	NO	6	6*	-	-	6
B-F	B5.40	PRZ NOZ-SAFEEND ≥4" (SURGE, SPRAY)	SUR/VOL	ALL WELDS	NO	2	2*	2	-	-
B-F	B5.50	PRZ NOZ-SAFEEND <4"	SUR (PRL^)	ALL WELDS	NO	3	3	^1 (PRL)	2 (SAFETY)	-
B-F	B5.70	SG NOZ-SAFEEND ≥4"	SUR/VOL	ALL WELDS	NO	6	6*	3 (LOOP A)	3 (LOOP B)	-
B-F	B5.130	BUTT WELD ≥4" (PRZ A-15/07B)	SUR/VOL	ALL WELDS	NO	1	1	-	-	1
B-F	B5.140	BUTT WELD <4" (PRZ A-19/01)	SUR	ALL WELDS	NO	1	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						19	19	6	5	8
TOTAL NUMBER OF EXAMS ACCUMULATED								6	11	19
REQUIRED ACCUMULATED NUMBER PER PERIOD								4 - 6	10 - 12	19

*NOTE: AUTOMATED EXAMS ^SPRAY NOZZLE WILL RECEIVE AN ADDITIONAL UT EXAM

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-G-1 PRESSURE RETAINING BOLTING >2" DIAMETER										
B-G-1	B6.10	RPV CLOSURE HEAD NUTS	SUR	ALL NUTS >2"	NO	48	48	24	-	24
B-G-1	B6.30	RPV CLOSURE STUDS REM.	SUR/VOL	ALL STUDS >2"	NO	48	48	-	24	24
B-G-1	B6.40	RPV THREADS IN FLANGE*	VOL	ALL STUD HOLES >2"	NO	48	48	48	-	-
B-G-1	B6.50	RPV CLOSURE WASHERS	VT1	ALL WASHERS >2"	NO	48	48	-	-	48
B-G-1	B6.180	PUMP BOLTS/STUDS (RC-3B)	VOL	ALL BOLTS/STUDS >2"	NO	64	16	-	16	-
B-G-1	B6.190	PUMP FLANGE/SURF.	VT1	WHEN DISASSEMBLED	NO	4	0	-	-	-
B-G-1	B6.200	PUMP NUTS/BUSH./WASHERS (RC-3B)	VT1	ALL >2"	NO	64	16	-	16	-
TOTAL NUMBER OF EXAMS PER COLUMN						324	224	72	56	96
TOTAL NUMBER OF EXAMS ACCUMULATED								72	128	224
REQUIRED ACCUMULATED NUMBER PER PERIOD								36 - 76	112 - 150	224
NOTE: DUE TO EXCESSIVE DOSE & STAGING, THREADS IN FLANGE WILL BE PERFORMED AT THE SAME TIME AS SHELL-TO-FLANGE WELD (ITEM #B1.30)										
B-G-2 PRESSURE RETAINING BOLTING 2" AND LESS IN DIAMETER										
B-G-2	B7.20	PRZ BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	1	1	1	-	-
B-G-2	B7.30	SG BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	4	4	2 (LOOP A)	2 (LOOP B)	-
B-G-2	B7.50	PIPING BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	6	6	2	2	2
B-G-2	B7.60	PUMPS BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	4	4	2 (LOOP A)	2 (LOOP B)	-

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-G-2	B7.70	VALVES BOLTS/STUDS/NUTS	VT1	ALL <2"	NO	15	15	2	4	9
B-G-2	B7.80	CRD BOLTS/STUDS/NUTS	VT1	ALL <2" IF DISASSEMBLED	NO	37	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN						67	30	9	10	11
TOTAL NUMBER OF EXAMS ACCUMULATED								9	19	30
REQUIRED ACCUMULATED NUMBER PER PERIOD								5 - 10	15 - 20	30
B-J PRESSURE RETAINING WELDS IN PIPING										
B-J	B9.10	PIPE ≥4"								
B-J	B9.11	CIRCUMFERENTIAL	SUR/VOL	25% ALL WELDS	NO	186	*84	15	15	15
B-J	B9.12	LONGITUDINAL	SUR/VOL	INTERSECT CIRC	NO	SEAMLESS	-	-	-	-
B-J	B9.20	PIPE <4"								
B-J	B9.21	CIRCUMFERENTIAL	SUR	25% ALL WELDS	NO	148	*	13	13	13
B-J	B9.22	LONGITUDINAL	SUR	INTERSECT CIRC	NO	SEAMLESS	-	-	-	-
B-J	B9.30	BRANCH CONNECTIONS		25% ALL WELDS						
B-J	B9.31	PIPE SIZE ≥4"	SUR/VOL		NO	6	*5	-	1	1
B-J	B9.32	PIPE SIZE <4"	SUR		NO	13	*	1	1	1
B-J	B9.40	SOCKET WELDS	SUR	25% ALL WELDS	NO	277	70	24	24	22

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
TOTAL NUMBER OF EXAMS PER COLUMN						630	159	53	54	52
TOTAL NUMBER OF EXAMS ACCUMULATED								53	106	159
REQUIRED ACCUMULATED NUMBER PER PERIOD								25 - 54	80 - 106	159
*NOTE: REQUIRED NUMBER OF EXAMS IS FOR THE TOTALS OF BOTH CIRCUMFERENTIAL WELDS (334 x 25%) AND BOTH BRANCH CONNECTIONS (19 x 25%)										
B-K-1 INTEGRAL ATTACHMENTS FOR CLASS 1 VESSELS, PIPING, PUMPS & VALVES										
B-K-1	B10.10	SG & PZR INT WELDED ATTACH	SUR OR VOL	ALL WELDS	NO	9	5	1	4	-
B-K-1	B10.20	PIPING WELDED ATTACH. (A-42)	SUR OR VOL	ALL	NO	4	1	-	-	1
B-K-1	B10.30	PUMP WELDED ATTACH. (RC-3B)	SUR OR VOL	1 LOOP	NO	12	3	3	-	-
TOTAL NUMBER OF EXAMS PER COLUMN						25	9	4	4	1
NOTE: LOW NUMBER OF EXAM LOCATIONS (4) PRECLUDES TYPICAL SAMPLING PER PERIOD										
B-L-1 PRESSURE RETAINING WELDS IN PUMPS										
B-L-1	B12.10	PUMP CASING WELDS	VT1	ALL (CODE CASE 481)	YES	4	1	1 (RC-3C)	-	-
B-L-2 PUMP CASINGS										
B-L-2	B12.20	PUMP INTERNALS (& BAFFLE WELDS)	VT3	INTERNAL SURFACES (ONLY IF DISASSEMBLED)	YES	4	-	-	-	-
B-M-1 PRESSURE RETAINING WELDS IN VALVE BODIES										
B-M-1	B12.30	PIPE SIZE <4"	SUR	1 OF EACH SIMILAR IN GROUP	YES	25	7	2	3	2

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-M-1	B12.40	PIPE SIZE ≥4"	VOL	1 OF EACH SIMILAR IN GROUP	YES	1	1	-	-	1
TOTAL NUMBER OF EXAMS PER COLUMN						26	8	2	3	3
TOTAL NUMBER OF EXAMS ACCUMULATED								2	5	8
REQUIRED ACCUMULATED NUMBER PER PERIOD								2	4-5	8
B-M-2 VALVE BODIES										
B-M-2	B12.50	VALVE BODIES >4"	VT3	INTERNAL SURFACES	YES	14	3	*	*	*
* THESE EXAMS WILL BE SCHEDULED AROUND VALVE DISASSEMBLY MAINTENANCE (ONE OF EACH SIMILAR IN GROUP)										
B-N-1 RPV INTERIOR										
B-N-1	B13.10	VESSEL INTERIOR	VT3	EACH INSPECTION PERIOD	NO	1	3	1	1	1 (PaR)
B-N-2	B13.50	INTERIOR ATTACHMENTS WITHIN BELTLINE (SURVEILLANCE CAPSULES)	VT1	ACCESSIBLE WELDS	YES	6	6	-	-	6 (PaR)
B-N-2	B13.60	INTERIOR ATTACHMENTS BEYOND BELTLINE (6 CORE SUPPORT LUGS, 9 CORE STOP LUGS)	VT3	ACCESSIBLE WELDS	YES	15	15	-	-	15 (PaR)
B-N-3 REMOVABLE CORE SUPPORT STRUCTURES										
B-N-3	B13.70	CORE SUPPORT STRUCTURE	VT3	ACCESSIBLE WELDS/SURFACES	YES	1	1	-	-	1
B-O PRESSURE RETAINING WELDS IN CONTROL ROD HOUSINGS										
B-O	B14.10	WELDS IN CRD HOUSING	SUR	10% PERIPHERAL HOUSINGS (20)	YES	80 (4 WELDS EACH)	8	2	3	3

TABLE 1B
INTERVAL 3 CLASS 1 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	DEFERRAL TO END	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
B-P ALL PRESSURE RETAINING COMPONENTS										
B-P	ALL	ALL CATEGORY B-P VT2 EXAMS PERFORMED UNDER 3000 SERIES SURVEILLANCE TESTS								
F-A	F1.10	PIPING SUPPORTS	VT3	*25%	NO	**96	24	6	8	10
F-A	F1.40	SUPPORTS OTHER THAN PIPING (REQUIRES ONLY 1 SG, 1 RCP & 1 PRZ)	VT3	*100%	NO	21	8	4	3	1
TOTAL NUMBER OF EXAMS PER COLUMN							32	10	11	11
TOTAL NUMBER OF EXAMS ACCUMULATED								10	21	32
REQUIRED ACCUMULATED NUMBER PER PERIOD								6 - 10	16 - 21	32

NOTE: * EXAMS SELECTED PER CODE CASE N-491

** THERE ARE ALSO 48 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-A PRESSURE RETAINING WELDS IN PRESSURE VESSELS									
C-A	C1.10	SHELL CIRC. WELDS (SG)	VOL	AT GROSS STRUCTURAL DISCONTINUITY	6	3	-	2 (TRANS) 1 (EXT. RING)	-
C-A	C1.20	HEAD CIRC. WELDS (SG, SDHX, RGHX)	VOL	HEAD-TO-SHELL WELD	8	3	1 RG	1 (SG)	1 SD
C-A	C1.30	TUBESHEET-TO-SHELL WELD (SG, SDHX, RGHX)	VOL	TUBE-TO-SHELL WELD	6	3	1 RG	1 SG	1 SD
TOTAL NUMBER OF EXAMS PER COLUMN					20	9	2	5	2
TOTAL NUMBER OF EXAMS ACCUMULATED							2	7*	9
REQUIRED ACCUMULATED NUMBER PER PERIOD							2-3	5-6	9
* SEE NOTE UNDER CATEGORY C-B									
C-B PRESSURE RETAINING NOZZLE WELDS IN VESSELS									
C-B	C2.20	NOZZLES WITHOUT REINFORCING PLATE IN VESSELS >½" NOMINAL THICKNESS							
C-B	C2.21	NOZZLE-TO-SHELL (OR HEAD) (MS, FW, SDHX, RGHX)	SUR/VOL	ALL NOZZLES UNDER C-F	12	6	2 RGHX	1 MS/1 FW	2 SDHX
C-B	C2.22	NOZZLE INNER RADIUS (MS, FW)	VOL	ALL NOZZLES UNDER C-F	4	2	-	1 MS/1 FW	-
TOTAL NUMBER OF EXAMS PER COLUMN					16	8	2	4	2
TOTAL NUMBER OF ACCUMULATED EXAMS							2	6*	8
REQUIRED ACCUMULATED NUMBER PER PERIOD							2	4-5	8
*NOTE: DUE TO THE COST OF SETTING UP AND PERFORMING AUTOMATED EXAMS ON INNER RADIUS AREAS (ITEMS C2.21 & B3.140) & SAFE END WELDS (ITEM C5.51) AS WELL AS RADIOLOGICAL CONCERNS & STAGING FOR COMMON EXAM AREAS (SCAFFOLD & INSULATION R/R), ALL WORK ON SG-B WILL BE PERFORMED IN THE 2ND PERIOD									

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-C INTEGRAL ATTACHMENTS FOR VESSELS, PIPING, PUMPS AND VALVES									
C-C	C3.10	PRESSURE VESSEL ATTACH. (4 RGHX - 1") (4 SG TRUNNIONS)	SUR	≥⅓"	8	2	1 (RGHX)	-	1 (SG)
C-C	C3.20	PIPING ATTACHMENTS	SUR	≥⅓"	21	3	-	2	1
C-C	C3.30	PUMP ATTACHMENTS	SUR	≥⅓"	0	-	-	-	-
C-C	C3.40	VALVE ATTACHMENTS	SUR	≥⅓"	0	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					29	5	1	2	2
TOTAL NUMBER OF EXAMS ACCUMULATED							1	3	5
REQUIRED ACCUMULATED NUMBER PER PERIOD							1	3	5
C-D PRESSURE RETAINING BOLTING >2" DIAMETER				NONE IN PROGRAM					
C-F-1 PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL OR HIGH ALLOY PIPING ^(NOTE: 7.5% BUT NOT LESS THAN 28 WELDS)									
C-F-1	C5.10	PIPING WELDS ≥3/8" WALL THICKNESS FOR PIPING > NPS 4							
C-F-1	C5.11	CIRCUMFERENTIAL	SUR/VOL	^SEE NOTE ABOVE	359	45	15	15	15
C-F-1	C5.12	LONGITUDINAL	SUR/VOL	2.5T AT INTER. CIRC.	306	*	-	-	-
C-F-1	C5.20	PIPING WELDS >1/5" NOMINAL WALL THICKNESS FOR PIPING ≥ NPS 2 ≤ NPS 4							
C-F-1	C5.21	CIRCUMFERENTIAL	SUR/VOL	^SEE NOTE ABOVE	158	12	4	4	4
C-F-1	C5.22	LONGITUDINAL	SUR/VOL	2.5T AT INTER. CIRC.	0	-	-	-	-
C-F-1	C5.30	SOCKET WELDS	SUR		480	36	12	12	12

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-F-1	C5.40	PIPE BRANCH CONN. OF BRANCH PIPING ≥ NPS 2							
C-F-1	C5.41	CIRCUMFERENTIAL	SUR	^SEE NOTE ABOVE	9	2	-	1	1
C-F-1	C5.42	LONGITUDINAL	SUR	2.5T AT INTER. CIRC.	0	-	-	-	-
C-F-1	N/A	PIPING WELDS > NPS 4 AND < 3/8" WALL THICKNESS			273	0	-	-	-
*NOTE: LONGSEAMS ARE EXAMINED WITH SELECTED INTERSECTING CIRCUMFERENTIAL WELDS									
TOTAL NUMBER OF EXAMS PER COLUMN					1279	96	32	32	32
TOTAL NUMBER OF EXAMS ACCUMULATED							32	64	96
REQUIRED ACCUMULATED NUMBER PER PERIOD							16 - 32	48 - 64	96
C-F-2 PRESSURE RETAINING WELDS IN CARBON OR LOW ALLOY STEEL PIPING ^(NOTE: 7.5% BUT NOT LESS THAN 28 WELDS)									
C-F-2	C5.50	PIPING WELDS ≥ 3/8" WALL THICKNESS FOR PIPING > NPS 4							
C-F-2	C5.51	CIRCUMFERENTIAL	SUR/VOL	^SEE NOTE ABOVE	78	33	11	11	11
C-F-2	C5.52	LONGITUDINAL	SUR/VOL	2.5T AT INTER.	0	-	-	-	-
C-F-2	C5.60	PIPING WELDS > 1/5" NOMINAL WALL THICKNESS FOR PIPING ≥ 2 NPS ≤ 4 NPS							
C-F-2	C5.61	CIRCUMFERENTIAL	SUR/VOL	^SEE NOTE ABOVE	0	-	-	-	-
C-F-2	C5.62	LONGITUDINAL	SUR/VOL	2.5T AT INTER.	0	-	-	-	-
C-F-2	C5.70	SOCKET WELDS	SUR		0	-	-	-	-
C-F-2	C5.80	PIPE BRANCH CONNECTIONS OF BRANCH PIPING ≥ NPS 2							

TABLE 1C
INTERVAL 3 CLASS 2 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
C-F-2	C5.81	CIRCUMFERENTIAL	SUR		8	1			
C-F-2	C5.82	LONGITUDINAL	SUR	2.5T AT INTER.	0	-	-	-	-
C-F-2	N/A	PIPING WELDS > NPS 4 AND < 3/8" WALL THICKNESS			358	-	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					444	34	11	11	12
TOTAL NUMBER OF EXAMS ACCUMULATED							11	22	34
REQUIRED ACCUMULATED NUMBER PER PERIOD							6 - 11	17 - 22	34
* PERFORMED UNDER SURVEILLANCE TESTS									
C-G PRESSURE RETAINING WELDS IN PUMPS AND VALVES									
C-G	C6.10	PUMP CASING WELDS	SUR	ALL UNDER C-F	0		-	-	-
C-G	C6.20	VALVE BODY WELDS	SUR	ALL UNDER C-F	1	1	-	-	1
C-H	C7.10 THROUGH C7.80	ALL OF THESE EXAMS ARE PERFORMED UNDER OPPD TECHNICAL SPECIFICATION 3.3(1)a							
F-A	F1.20	PIPING SUPPORT	VT3	*15%	**487	74	25	24	25
TOTAL NUMBER OF EXAMS PER COLUMN							25	24	25
TOTAL NUMBER OF EXAMS ACCUMULATED							25	49	74
REQUIRED ACCUMULATED NUMBER PER PERIOD							12 - 25	37 - 49	74
NOTE: * EXAMS SELECTED PER CODE CASE N-491 ** THERE ARE ALSO 162 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14									

TABLE 1D
INTERVAL 3 CLASS 3 EXAMS

CATEGORY NUMBER	ITEM NUMBER	EXAMINATION AREA	EXAM METHOD	REQUIRED EXAMS	TOTAL NUMBER	NUMBER REQUIRED	NUMBER 1ST PERIOD	NUMBER 2ND PERIOD	NUMBER 3RD PERIOD
D-B SYSTEMS IN SUPPORT OF EMERGENCY CORE COOLING, CONTAINMENT HEAT REMOVAL, ATMOSPHERE CLEANUP & REACTOR RESIDUAL HEAT REMOVAL									
D-A	D1.10	PRESSURE VESSELS	VT2	PRESSURE RETAINING BOUNDARY	*	*			
D-A	D1.20	PIPING	VT3	INTEGRAL ATTACHMENT	70	7	2	2	3
D-A	D1.30	PUMPS	VT3	INTEGRAL ATTACHMENT	0	0	-	-	-
D-A	D1.40	VALVES	VT3	INTEGRAL ATTACHMENT	0	0	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					70	7	2	2	3
TOTAL NUMBER OF EXAMS ACCUMULATED							2	4	7
REQUIRED ACCUMULATED NUMBER PER PERIOD							1 - 2	4	7
F-A SUPPORTS									
F-A	F1.30A	CLASS 3 PIPING SUPPORTS (ONE DIRECTION SUPPORTS)	VT3		272	27	9	9	9
F-A	F1.30B	CLASS 3 PIPING SUPPORTS (MULTI DIRECTIONAL RESTRAINTS)	VT3		222	23	7	8	8
F-A	F1.30C	CLASS 3 PIPING SUPPORTS (SPRING CANS)	VT3		21	2	1	-	1
F-A	F1.40	SEE CLASS 1 EXAMS	VT3		0	0	-	-	-
TOTAL NUMBER OF EXAMS PER COLUMN					**515	52	17	17	18
TOTAL NUMBER OF ACCUMULATED EXAMS							17	34	52
REQUIRED ACCUMULATED NUMBER PER PERIOD							9 - 17	26 - 34	52
NOTE: * EXAMS SELECTED PER CODE CASE N-491 ** THERE ARE ALSO 42 SNUBBERS WHICH ARE INSPECTED UNDER TECHNICAL SPECIFICATIONS 3.14									

PART 2: CLASS 1, CLASS 2, AND CLASS 3 VALVE TESTS

1.0 Program Summary

The Valve Test Program identifies test requirements for safety related valves and ensures that the valves are tested in accordance with the requirements of Subsection IWV of the ASME Section XI Boiler and Pressure Vessel Code, 1989 Edition, as delineated in O&M Part 1 and Part 10, 1987 Edition up to and including the 1988 Addenda.

The Valve Test Program will be applicable for the 120-month interval, which begins on September 26, 1993. The Valve Test Program will be reviewed and updated as required with that edition of the Code and Addenda in effect not more than 12 months prior to the start of the next 120-month interval (beginning September 26, 2003).

Individual valve test requirements are presented by coded Valve Test Program Matrix, Table 2.1. The codes used for these tables are defined in the "Table Format Fort Calhoun Station Valve Test Program Matrix Table 2.1." The Valve Test Program Matrix (Table 2.1) is arranged in numerical sequence by valve number. Appendix 2A provides justifications for valve test frequencies other than Quarterly. A basis for the test frequency is given as well as the frequency at which the valve will be tested. Appendix 2B provides justifications for exceptions taken to the ASME Section XI/O&M Code test requirements as provided for in 10CFR50.55a(g)(5)(iii). Two types of justifications are provided. The first is general in nature, and pertains to requirements found to be impractical for many valves. The second type is used to justify Code exceptions for specific valves. Code exceptions are numbered and referenced by number on the Valve Test Program Matrix Table 2.1.

2.0 Scope and Responsibility

2.1 The P&IDs listed in Part 4 of the Plan identify the location of each Class 1, Class 2, and Class 3 and other classes of valves "important to safety" as determined by the Fort Calhoun Station (FCS) IST philosophy.

2.2 The Class 1, Class 2, and Class 3 and other classes of valves "important to safety" to be tested under O&M Part 1 and Part 10, the methods of testing for each valve, and exceptions to the tests of O&M Part 1 and Part 10, are found in the Valve Test Program Matrix Table 2.1 and Appendices 2A and 2B.

2.3 Many safety related systems, particularly those with heat exchangers, have been provided with relief valves. These relief valves are thermal relief valves of small capacity intended to relieve pressure due to a thermal expansion of fluid in a "bottled-up" condition (generally occurring only during maintenance), which is considered a self-limiting transient. Experience has shown that failures of these valves will not result in failure of a system to fulfill its safety related function. Thus, most thermal relief valves are not considered to perform a safety function as defined by O&M Part 1 and Part 10, and such

valves have not been included in the ISI Program Plan at the Fort Calhoun Station.

2.4 As a result of regulatory concerns regarding Containment Integrity issues (Reference CID Nos. 883627 and 882025) the following actions are taken and will be required of all future changes/upgrades to applicable surveillance tests required by the FCS ISI Program Plan.

2.4.1 Surveillance Tests for Containment Isolation Valves Leakage (Type C) tests have been upgraded to include detailed drawings of all designated test tees and require procedural signoffs for removal and reinstallation of test tee caps.

2.4.2 A separate documented and double verified checklist of designated swagelock caps has been developed and this check list will be performed by the Operations Department prior to power operation following a Refueling Outage to ensure Containment Integrity (OI-CO-5).

3.0 Inservice Test Frequency

3.1 The inservice test frequency for Class 1, Class 2 and Class 3 valves and other valves "important to safety" is in accordance with O&M Part 1 and Part 10 with exceptions as found in Appendices 2A and 2B.

3.2 Valves identified herein as being tested at Cold Shutdown frequency shall be tested each Cold Shutdown (as defined by FCS Technical Specifications) where the duration of the shutdown is sufficient to accomplish the tests. Valve testing should commence not later than 48 hours after Cold Shutdown and continue until complete or, the 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 Shutdowns to meet the Code required testing frequency. Where more than one Cold Shutdown occurs within three months, the test frequency need not exceed once per three-month period (92 days).

4.0 Valve Categories

The valve categories for each Class 1, Class 2, Class 3 and other "important to safety" valves have been determined from O&M Part 1 and Part 10 with exceptions as found in Appendices 2A and 2B.

5.0 Test Methods

5.1 The methods to be used to test Class 1, Class 2, Class 3 and "important to safety" valves have been determined from the appropriate sections of O&M Parts 1 and 10. These methods, along with exceptions, are listed in the Valve Test Program Matrix Table 2.1 and Appendices 2A and 2B (of this Program Plan).

5.2 Valves with remote position indicators shall be observed locally, or verified by other positive methods (such as changes in flow or pressure directly attributed to valve movement) at least once every two years in order to verify that valve operation is accurately indicated.

5.3 Valves with safety related failure positions indicated in the valve tables will be tested by observing valve operation upon loss of actuator power at the frequency specified in the valve table.

5.4 Valve stroke times are measured from actuation of valve operating device to end of valve travel as indicated by remote valve position indication lights. The valves will be timed using the lights in the Control Room as applicable.

5.5 Valve stroke times which exceed the acceptance criteria as stated in Paragraph 4.2.1.8 of O&M Part 10 will be immediately retested and corrective action taken as delineated in Paragraph 4.2.1.9 of O&M, Part 10.

5.6 Valve stroke times which exceed the acceptance criteria as determined by guidance using Paragraph 4.2.1.4 of O&M Part 10 and listed in the Surveillance Test or the Acceptance Criteria Basis Document shall be immediately declared inoperable, and not returned to service until corrective action is taken.

6.0 Evaluation of Test Results

6.1 The evaluation of test results shall be in accordance with the appropriate paragraphs in O&M Part 10.

6.2 If test data show that a valve is operating in the "Alert Range", remedies shall be taken as required in accordance with O&M Parts 1 and 10 until corrective action is taken. If the test data shows that the valve is operating in the "Required Action Range", the valve shall be immediately declared inoperable and not returned to service until corrective action is taken. Corrective action is defined as one or more of the following steps:

6.2.1 Recalibrate the applicable instruments and reperform test, or

6.2.2 Repair or replace the component as required, or

6.2.3 Perform an Engineering Analysis to demonstrate that the valve is still able to perform its required safety design function.

7.0 Records and Reports

7.1 Records and reports for the testing of Class 1, Class 2 and Class 3 and other "important to safety" valves shall be made in accordance with Paragraphs 6.2 and 6.3 of O&M Part 10.

7.2 Records of corrective action for Class 1, Class 2, and Class 3 and other "important to safety" valves shall be made and maintained in accordance with Paragraph 6.4 of O&M Part 10.

8.0 Repair Requirements

Tests or examinations required to be performed after completion of valve replacement, repair or maintenance shall be completed as required per ASME. O&M Parts 1 and 10, and Section XI.

9.0 Valve Test Program Matrix

This section provides a tabulation of safety related valves, both those valves that are tested in accordance with the requirements of Part 1 and Part 10 of the O&M, and those valves for which the Code requirements have been found to be impractical. The Valve Test Program Matrix (Table 2.1) is arranged sequentially in numerical order by valve number.

10.0 Additions to Program - Valves

Valves added to the ISI Program Plan as a result of plant/system modifications, engineering changes or re-evaluation of a component eligibility requirement, per the O&M manual, are considered operable based on interim acceptance criteria (established by construction, preservice, post maintenance, or preoperational tests) until a trend is established.

TABLE FORMAT
FORT CALHOUN STATION VALVE TEST PROGRAM MATRIX TABLE 2.1

1. **Valve Number** — Unique number assigned to each valve.

2. **System (SYS)** — Plant system where valve is located. Designated by two (2) or three (3) letters.

   - AFW - Auxiliary Feedwater System
   - CA - Compressed Air System
   - CCW - Component Cooling Water System
   - CH - Charging System
   - CS - Containment Spray
   - DW - Demineralized Water System
   - FO - (Diesel Generator) Fuel Oil System
   - FW - Feedwater System
   - HG - Hydrogen Gas
   - IA - Instrument Air System
   - MS - Main Steam System
   - NG - Nitrogen Gas System
   - RC - Reactor Coolant System
   - RW - Raw Water System
   - SA - (Diesel Generator) Starting Air System
   - SI - Safety Injection System
   - SL - Primary Sample System
   - SW - Service Water System
   - VA - Ventilating Air System
   - WD - Waste Disposal System

3. **Category (CAT)** — Valve category as defined in O&M Part 10.

   a. Category A — Valves for which seat leakage is limited to a specific maximum amount in the closed position to fulfill their required functions.

   b. Category B — Valves for which seat leakage in the closed position is inconsequential for fulfillment of their required functions.

   c. Category C — Valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of their required function(s).

   d. Category D — Valves which are actuated by an energy source capable of only one operation, such as rupture disks or explosive-actuated valves.

4. **Class (CL)** — ASME Class (1, 2, 3, 4, or N)

5. **P&ID** — Plant drawing number where valve is found.

6. **Coordinates** — Location of valve on plant drawing.

7. **Valve Type** — The following is a list of the type of valves with the code used in the Valve Test Program Tables.

- BU - Butterfly
- BL - Ball
- CK - Check
- PG - Plug
- GA - Gate
- GL - Globe
- DI - Diaphragm
- RL - Relief

8. **Operator Type (OPER TYPE)**

The following is a list of the types of operators used to change the position of the valve, with the code used in the Valve Test Program Table to reflect the operator type.

- A - Air Operator
- M - Motor Operator
- R - Relief
- P - Piston Operator
- C - Self Actuated
- S - Solenoid Operator
- H - Manual (Hand)

9. **Valve Size** — Nominal diameter of valve in inches.

10. **Normal Position (NOR POS)**

The following is a list of valve positions during normal operation and the code used in the Valve Test Program Table to reflect that position.

- A - Automatic
- NO - Normally Open
- NC - Normally Closed
- LO - Locked Open
- LC - Locked Closed
- \- - Valve position determined by other system parameters as in the case of check valves

11. **Fail Position (FAIL POS)**

The following is a list of valve failure positions and the code used in the Valve Test Program Table to reflect that position.

- FC - Fails Closed
- FO - Fails Open
- FAI - Fails As Is
- \- - Valve failure position determined by other system parameters as in the case of check valves.

12. **Testing Requirements (TEST REQ)**

This column indicates the position to which the valve is to be tested in order to satisfy the Code test requirements which apply to the valve. The following is a list of the codes used in the Valve Test Program Table.

- O - Valve shall be exercised to the **Open** position
- C - Valve shall be exercised to the **Closed** position
- T - Valve shall be tested to ensure meeting a specific **Trip** position
- L - Valve shall be tested for seat tightness and **Leak** criteria

13. **Type Test** The following is a list of tests required to be performed per ASME O&M Part 1 and Part 10 Code and the code used in the Valve Test Program Table to reflect that test.

- FS - Full-Stroke Test
- PS - Partial-Stroke Test
- LT - Leak Test
- ST - Stroke-Time Test
- SP - Setpoint Trip Test
- SD - Sample Disassembly
- ME - Manual Exercise

14. **Testing Frequency (TEST FREQ)**

The codes used in this column indicate the plant operational status that must be achieved before a particular valve can be safely and practically tested.

- Q - Quarterly

  Valves in this category shall be tested Quarterly during normal plant operation. (Technical Specification Modes 1 through 3)

- CS - Cold Shutdown

  Cold shutdown conditions are defined in the FCS Technical Specifications. (See Part 2 Section 3.2 of this Program Plan for further explanation).

- CS* - Pressure Isolation Valves

  Surveillance of the Reactor Coolant System (RCS) Pressure Isolation Valves (PIV) -Plant Technical Specification 3.3(2) states that periodic leakage testing on each valve listed in Table 2-9 (as a PIV) shall be accomplished:

  (1) prior to entering the power operation mode every time the plant is placed in the Cold Shutdown condition for refueling;

  (2) each time the plant is placed in a Cold Shutdown condition for 72 hours if testing has not been accomplished in the preceding nine months; and

  (3) prior to returning the valve to service after maintenance, repair or replacement work is performed.

- RO - Refueling Outage

  Refueling conditions are defined in the FCS Technical Specifications.

- RO* - Refueling Outage

  The valves in this category will be sample disassembled and inspected at an interval not to exceed once every six (6) years.

- 2YR - Periodic valve leakage rate determination for Category A valves shall be performed at a minimum of two year intervals in accordance with O&M Part 10.

- OM - The relief valves will be tested in accordance with the frequency established by O&M Part 1.

- OM* - The relief valve will be tested once every third refueling outage.

15. **Valve Position Indication Test (VPI TEST)**

This column indicates if a remote Valve Position Indication verification test is required. Valves with remote position indicators, which are used to verify valve exercising or timing, will have their remote position indicators verified in accordance with O&M Paragraph 4.1 of Part 10.

16. **Code Exception (CODE EXPT)**

If the valve is being tested at the Code required frequency (e.g., Quarterly) in accordance with O&M Part 1 or Part 10 requirements, this column will have a "-." However, for valves with impractical O&M Part 1 and Part 10 frequency requirements, this column will have a reference frequency justification number (JXX). This number is addressed in Appendix 2A.

If the valve is being tested in accordance with O&M Part 1 or Part 10 requirements, this column will have a "-." However, for valves which the O&M Part 10 requirements have been found to be impractical, this column will have a reference code exception number (EXX). This reference number is addressed in Appendix 2B with a complete explanation of the specific exception and the justification for that exception.

17. **Remarks**

This column is provided for pertinent information as appropriate. Notes in Column 17 of the Instrument Air (IA) Check Valves refer to Notes 1 through 5 listed below.

NOTE #1 These valves are check valves on Instrument Air accumulators attached to process valves that are specified for testing elsewhere in the ISI Program Plan. The IA check valves will be tested on the same schedule as the process valve to which it is attached.

NOTE #2 These valves are check valves on IA accumulators on bubblers that are part of the level indication/control system for the Safety Injection Refueling Water Tank (SIRWT). The ISI Program Plan speaks only to the testing of the check valve in this system.

NOTE #3 These valves are check valves on IA accumulators attached to HCV-238 and HCV-239 (which are located inside the containment). The process valves are remotely stroke tested Quarterly, but due to inaccessibility accumulator check valves IA-HCV-238-C and IA-HCV-239-C will be tested at Cold Shutdown.

NOTE #4 These valves are check valves on IA accumulators attached to PCV-6680A-1, PCV-6680A-2, PCV-6680B-1, PCV-6680B-2 and PCV-6682. The valves are located in Room 81. The dampers are not required to be tested; however, the IA accumulator check valves are required to be tested at Cold Shutdown.

NOTE #5 These valves are check valves on IA accumulators attached to HCV-480, HCV-484, and HCV-485. The check valves are tested opened and closed quarterly. Reference MR-FC-89-032.

TABLE FORMAT
FORT CALHOUN STATION VALVE TEST PROGRAM MATRIX TABLE 2.1 (Continued)

NOTE #6	The valves are check valves on IA accumulators to HCV-2898A/B and HCV-2899A/B. The check valves are tested open and closed Quarterly. Reference MR-FC-94-020.

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATE	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-100	SI	C	2	210-130-3	C1	CK	C	6	-	-	O	PS	Q	-	J1	OP-ST-SI-3008
SI-100	SI	C	2	210-130-3	C1	CK	C	6	-	-	O	FS	RO	-	J1	OP-ST-SI-3007
AC-101	CCW	C	3	M-10-2	E6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3002
AC-101	CCW	C	3	M-10-2	E6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3012/3022
PCV-102-1	RC	B	1	210-110-1A	E7	GL	S	2.5	NC	FC	C	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-1	RC	B	1	210-110-1A	E7	GL	S	2.5	NC	FC	O	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-2	RC	B	1	210-110-1A	E8	GL	S	2.5	NC	FC	O	ST	CS	Y	J2	OP-ST-RC-3004
PCV-102-2	RC	B	1	210-110-1A	E8	GL	S	2.5	NC	FC	C	ST	CS	Y	J2	OP-ST-RC-3004
SI-102	SI	C	2	210-130-3	C4	CK	C	4	-	-	O	FS	RO	-	J3	OP-ST-SI-3007
SI-102	SI	C	2	210-130-3	C4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007
AC-104	CCW	C	3	M-10-2	D6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3012
AC-104	CCW	C	3	M-10-2	D6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3002/3022
FO-104	FO	C	3	M-262-1	F6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3002
FO-104	FO	C	3	M-262-1	F6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3002
SI-104	SI	C	2	210-130-3	C4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008
FO-105	FO	C	3	M-262-1	E6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3002
FO-105	FO	C	3	M-262-1	E6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3002
FO-106	FO	C	3	M-262-1	D6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3001
FO-106	FO	C	3	M-262-1	D6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3001
AC-107	CCW	C	3	M-10-2	C6	CK	C	12	-	-	O	FS	Q	-	-	OP-ST-CCW-3022
AC-107	CCW	C	3	M-10-2	C6	CK	C	12	-	-	C	FS	Q	-	-	OP-ST-CCW-3002/3012
FO-107	FO	C	3	M-262-1	C6	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-FO-3001
FO-107	FO	C	3	M-262-1	C6	CK	C	1	-	-	C	FS	Q	-	-	OP-ST-FO-3001
SI-108	SI	C	2	210-130-3	D4	CK	C	4	-	-	O	FS	RO	-	J3	OP-ST-SI-3007
SI-108	SI	C	2	210-130-3	D4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007
SI-110	SI	C	2	210-130-3	E4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008
NG-113	CCW	A/C	3	M42 SH. 1	D7	CK	C	1	-	-	O	FS	Q	-	-	SE-ST-CCW-3003
NG-113	CCW	A/C	3	M42 SH.1	D7	CK	C	1	-	-	C	FS	Q	-	-	SE-ST-CCW-3003
NG-113	CCW	A/C	3	M42 SH. 1	D7	CK	C	1	-	-	L	LT	2YR	-	-	SE-ST-CCW-3003
SI-113	SI	C	2	210-130-3	E1	CK	C	8	-	-	O	PS	Q	-	J1	OP-ST-SI-3008
SI-113	SI	C	2	210-130-3	E1	CK	C	8	-	-	O	FS	RO	-	J1	OP-ST-SI-3007
RW-115	RW	C	3	M-100-1	B4	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3031
RW-115	RW	C	3	M-100-1	B4	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-115	SI	C	2	210-130-3	E4	CK	C	4	-	-	O	FS	RQ	-	J3	OP-ST-SI-3007
SI-115	SI	C	2	210-130-3	E4	CK	C	4	-	-	C	FS	RO	-	J3	OP-ST-SI-3007

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
RW-117	RW	C	3	M-100-1	B5	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3021
RW-117	RW	C	3	M-100-1	B5	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-117	SI	C	2	210-130-3	F4	CK	C	1	-	-	O	FS	Q	-	-	OP-ST-SI-3008
RW-121	RW	C	3	M-100-1	B6	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3011
RW-121	RW	C	3	M-100-1	B6	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
SI-121	SI	C	2	210-130-1	A4	CK	C	8	-	-	O	FS	CS	-	J4	OP-ST-SI-3003
SI-121	SI	C	2	210-130-1	A4	CK	C	8	-	-	C	FS	CS	-	J4	OP-ST-SI-3003
RW-125	RW	C	3	M-100-1	B7	CK	C	20	-	-	C	FS	Q	-	-	OP-ST-RW-3004
RW-125	RW	C	3	M-100-1	B7	CK	C	20	-	-	O	FS	Q	-	-	OP-ST-RW-3011
SA-127	SA	C	3	B120F07001-1	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
SA-128	SA	C	3	B120F07001-1	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
CH-129	CH	C	3	210-121-1	A6	CK	C	3	-	-	O	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002
CH-129	CH	C	3	210-121-1	A6	CK	C	3	-	-	C	FS	Q	-	-	CH-4A DISCHARGE OP-ST-CH-3002
SA-129	SA	C	3	B120F07001-1	C7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
SI-129	SI	C	2	210-130-1	B4	CK	C	8	-	-	O	FS	CS	-	J4	OP-ST-SI-3003
SI-129	SI	C	2	210-130-1	B4	CK	C	8	-	-	C	FS	CS	-	J4	OP-ST-SI-3003
CH-130	CH	C	3	210-121-1	B7	CK	C	3	-	-	O	FS	Q	-	-	CH-4B DISCHARGE OP-ST-CH-3002
CH-130	CH	C	3	210-121-1	B7	CK	C	3	-	-	C	FS	Q	-	-	CH-4B DISCHARGE OP-ST-CH-3002
SA-130	SA	C	3	B120F07001-1	B7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
SI-135	SI	C	2	210-130-1	C4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-135	SI	C	2	210-130-1	C4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	O	SD	RO*	-	E1	SS-ST-SI-3018
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	O	PS	Q	-	E1	OP-ST-SI-3008
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-139	SI	A/C	2	210-130-1	D2	CK	C	20	-	-	C	FS	RO	-	-	SE-ST-SI-3005
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	O	PS	Q	-	E1	OP-ST-SI-3008
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	O	SD	RO*	-	E1	SS-ST-SI-3018
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-140	SI	A/C	2	210-130-1	C2	CK	C	20	-	-	C	FS	RO	-	-	SE-ST-SI-3005
RC-141	RC	C	1	210-110-1A	F6	RL	R	3	-	-	T	SP	RO	-	-	SENT OFFSITE SS-ST-RC-3002
NG-142	NG	A/C	2	M42 SH. 1	E5	CK	C	1	-	-	O	PS	Q	-	-	
NG-142	NG	A/C	2	M42 SH. 1	E5	CK	C	1	-	-	O	FS	CS	-	J43	SE-ST-NG-3002
NG-142	NG	A/C	2	M42 SH. 1	E5	CK	C	1	-	-	C	FS	CS	-	J43	SE-ST-NG-3002
NG-142	NG	A/C	2	M42 SH. 1	E5	CK	C	1	-	-	L	LT	2YR	-	-	SE-ST-NG-3002
RC-142	RC	C	1	210-110-1A	F6	RL	R	3	-	-	T	SP	RO	-	-	SENT OFFSITE SS-ST-RC-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
CH-143	CH	C	2	210-121-2	B5	CK	C	3	-	-	O	FS	CS	-	J5	OP-ST-CH-3006
SI-143	SI	C	2	210-130-1	D4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-143	SI	C	2	210-130-1	D4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
NG-144	NG	A/C	2	M42 SH. 1	E6	CK	C	1	-	-	O	PS	Q	-	-	
NG-144	NG	A/C	2	M42 SH. 1	E6	CK	C	1	-	-	O	FS	CS	-	J43	SE-ST-NG-3002
NG-144	NG	A/C	2	M42 SH. 1	E6	CK	C	1	-	-	C	FS	CS	-	J43	SE-ST-NG-3002
NG-144	NG	A/C	2	M42 SH. 1	E6	CK	C	1	-	-	L	LT	2YR	-	-	SE-ST-NG-3002
NG-146	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	O	PS	Q	-	-	
NG-146	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	O	FS	CS	-	J43	SE-ST-NG-3002
NG-146	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	C	FS	CS	-	J43	SE-ST-NG-3002
NG-146	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	L	LT	2YR	-	-	SE-ST-NG-3002
SA-147	SA	B	3	B120F07001-1	D3	DI	A	1.5	NC	FO	O	ST	Q	Y	-	DG START ACCEPT OP-ST-DG-0001
SA-147	SA	B	3	B120F07001-1	D3	DI	A	1.5	NC	FO	O	VPI	Q	Y	-	DG START ACCEPT OP-ST-DG-0001
NG-148	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	O	PS	Q	-	-	
NG-148	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	O	FS	CS	-	J43	SE-ST-NG-3002
NG-148	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	C	FS	CS	-	J43	SE-ST-NG-3002
NG-148	NG	A/C	2	M42 SH. 1	E7	CK	C	1	-	-	L	LT	2YR	-	-	SE-ST-NG-3002
SA-148	SA	B	3	B120F07001-1	C3	DI	A	1.5	NC	FO	O	ST	Q	Y	-	DG START ACCEPT OP-ST-DG-0002
SA-148	SA	B	3	B120F07001-1	C3	DI	A	1.5	NC	FO	O	VPI	2YR	Y	-	DG START ACCEPT OP-ST-DG-0002
SI-149	SI	C	2	210-130-1	E4	CK	C	8	-	-	O	FS	CS	-	J36	OP-ST-SI-3003
SI-149	SI	C	2	210-130-1	E4	CK	C	8	-	-	C	FS	CS	-	J36	OP-ST-SI-3003
HCV-150	RC	B	1	210-110-1A	D8	GA	M	2.5	NO	FAI	C	ST	Q	Y	-	OP-ST-RC-3002
HCV-150	RC	B	1	210-110	G8	FA	M	2.5	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3015
CH-151	CH	C	2	210-121-2	C7	CK	C	3	-	-	C	FS	Q	-	-	OP-ST-CH-3002
HCV-151	RC	B	1	210-110-1A	D7	GA	M	2.5	NO	FAI	C	ST	Q	Y	-	OP-ST-RC-3002
HCV-151	RC	B	1	210-110	G8	GA	M	2.5	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3015
SI-153	SI	C	2	210-130-1	E5	CK	C	6	-	-	O	FS	Q	-	-	OP-ST-SI-3008
CH-155	CH	C	2	210-121-2	A5	CK	C	3	-	-	O	FS	CS	-	J5	OP-ST-CH-3006
CH-156	CH	C	2	210-120-1	E3	CK	C	3	-	-	O	FS	CS	-	J5	OP-ST-CH-3006
SI-159	SI	C	2	210-130-3	B6	CK	C	24	-	-	O	SD	RO*	-	E2	SS-ST-SI-3016
SI-160	SI	C	2	210-130-3	B6	CK	C	24	-	-	O	SD	RO*	-	E2	SS-ST-SI-3016
FW-161	FW	C	2	M-253-1	D4	CK	C	16	-	-	C	FS	CS	-	J6	SE-ST-FW-3002
FW-162	FW	C	2	M-253-1	D6	CK	C	16	-	-	C	FS	CS	-	J6	SE-ST-FW-3002
FW-163	AFW	C	2	M-253-4	F7	CK	C	3	-	-	O	FS	CS	-	J7	OP-ST-AFW-3007
AC-164	CCW	C	3	M-10	D6	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
FW-164	AFW	C	2	M-253-4	F8	CK	C	3	-	-	O	FS	CS	-	J7	OP-ST-AFW-3007
AC-165	CCW	C	3	M-10	C6	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007
CH-166	CH	C	2	210-120-1	C2	CK	C	4	-	-	C	FS	CS	-	J35	SE-ST-AFW-3006
FW-173	AFW	C	3	M-253-4	C6	CK	C	4	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
FW-173	AFW	C	3	M-253-4	C6	CK	C	4	-	-	C	FS	Q	-	-	SE-ST-AFW-3005/3006
FW-174	AFW	C	3	M-253-4	C5	CK	C	4	-	-	O	FS	Q	-	-	SE-ST-AFW-3005/3006
FW-174	AFW	C	3	M-253-4	C5	CK	C	4	-	-	C	FS	Q	-	-	SE-ST-AFW-3005
SI-175	SI	C	2	210-130-2	B1	CK	C	12	-	-	O	SD	RO*	-	E3	SS-ST-SI-3017
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-176	RC	B	2	D-4078	E5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SI-176	SI	C	2	210-130-2	D1	CK	C	12	-	-	O	SD	RO*	-	E3	SS-ST-SI-3017
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-177	RC	B	2	D-4078	D5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-177	SA	C	3	B120F07001-2	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-178	RC	B	2	D-4078	C5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-178	SA	C	3	B120F07001-2	E7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-179	RC	B	2	D-4078	C5	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-179	SA	C	3	B120F07001-2	C7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-180	RC	B	2	D-4078	E3	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
SA-180	SA	C	3	B120F07001-2	B7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3004
CH-181	CH	C	2	210-120-1	F7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3002
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	O	ST	CS	Y	J8	OP-ST-RC-3005
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	C	ST	CS	Y	J8	OP-ST-RC-3005
HCV-181	RC	B	2	D-4078	C3	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-RC-3006
CH-182	CH	C	2	210-120-1	D7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3002
CH-183	CH	C	2	210-120-1	B7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3002
SI-183	SI	A	2	210-130-1	E6	GL	H	2	NC	-	L	LT	2YR	-	-	SE-ST-SI-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-184	SI	A	2	210-130-1	D6	GA	H	6	NC	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-185	SI	A	2	210-130-1	E8	GL	H	2	NC	-	L	LT	2YR	-	-	APPENDIX J
CH-187	CH	C	2	210-120-1	E7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
CH-187	CH	C	2	210-120-1	E7	CK	C	2	-	-	C	FS	Q	-	-	OP-ST-CH-3003
SI-187	SI	C	2	210-130-2	H5	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3009
CH-188	CH	C	2	210-120-1	C7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
CH-188	CH	C	2	210-120-1	C7	CK	C	2	-	-	C	FS	Q	-	-	OP-ST-CH-3003
SI-188	SI	C	2	210-130-2	H5	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3009
CH-189	CH	C	2	210-120-1	A7	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-CH-3003
CH-189	CH	C	2	210-120-1	A7	CK	C	2	-	-	C	FS	Q	-	-	OP-ST-CH-3003
SI-189	SI	C	2	210-130-2	H6	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3009
SI-190	SI	C	2	210-130-2	H7	RL	R	1.5	-	-	T	SP	OM	-	-	PE-ST-VX-3009
SI-194	SI	A/C	1	210-130-2A	D7	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
SI-194	SI	A/C	1	210-130-2A	D7	CK	C	6	-	-	L	LT	CS*	-	J9	PIV SE-ST-SI-3015
SI-195	SI	A/C	1	210-130-2A	D8	CK	C	2	-	-	L	LT	CS*	-	J9	PIV SE-ST-SI-3015
SI-195	SI	A/C	1	210-130-2A	D8	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-196	SI	C	1	210-130-2A	D8	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-196	SI	C	1	210-130-2A	D8	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
SA-197	SA	B	3	B120F07001-2	D3	DI	A	1.5	NC	FO	O	ST	Q	Y	-	DG START ACCEPT OP-ST-DG-0001
SA-197	SA	B	3	B120F07001-2	D3	DI	A	1.5	NC	FO	O	VPI	2YR	Y	-	DG START ACCEPT OP-ST-DG-0001
SI 197	SI	A/C	1	210-130-2A	D6	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-197	SI	A/C	1	210-130-2A	D6	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
CH-198	CH	C	2	210-120-1A	B2	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-198	CH	C	2	210-120-1A	B2	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003
CH-198	CH	C	2	210-120-1A	B2	CH	C	2	-	-	C	FS	RO	-	J12	SE-ST-CH-3004
SA-198	SA	B	3	B120F07001-2	C3	DI	A	1.5	NC	FO	O	ST	Q	Y	-	DG START ACCEPT OP-ST-DG-0001
SA-198	SA	B	3	B120F07001-2	C3	DI	A	1.5	NC	FO	O	VPI	2YR	Y	-	DG START ACCEPT OP-ST-DG-0001
SI-198	SI	A/C	1	210-130-2A	D6	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-198	SI	A/C	1	210-130-2A	D6	CK	C	2	-	-	L	LT	CS*	-	J10	PIV SE-ST-SI-3015
SI-199	SI	C	1	210-130-2A	C7	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-199	SI	C	1	210-130-2A	C7	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
SI-200	SI	A/C	1	210-130-2A	D5	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-200	SI	A/C	1	210-130-2A	D5	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
SI-201	SI	A/C	1	210-130-2A	D5	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-201	SI	A/C	1	210-130-2A	D5	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SA-202	SA	C	3	B120F07001-1	C3	CK	C	0.25	-	-	C	FS	Q	-	-	DG START ACCEPT OP-ST-DG-0001
SI-202	SI	C	1	210-130-2A	C5	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-202	SI	C	1	210-130-2A	C5	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
TCV-202	CH	A	1	210-120-1A	E5	GL	A	2	A	FC	C	ST	CS	Y	J13	OP-ST-CH-3005
TCV-202	CH	A	1	210-120-1A	E5	GL	A	2	A	FC	L	LT	2YR	-	-	APPENDIX J
TCV-202	CH	A	1	210-120-1A	E5	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
CH-203	CH	C	1	210-120-1A	C5	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-203	CH	C	1	210-120-1A	C5	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003
SA-203	SA	C	3	B120F07001-1	C5	CK	C	0.25	-	-	C	FS	Q	-	-	DG START ACCEPT OP-ST-DG-0001
SI-203	SI	A/C	1	210-130-2A	D3	CK	C	6	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
SI-203	SI	A/C	1	210-130-2A	D3	CK	C	6	-	-	O	FS	CS	-	J9	OP-ST-SI-3003
CH-204	CH	C	1	210-120-1A	A5	CK	C	2	-	-	O	PS	Q	-	J12	OP-ST-CH-3003
CH-204	CH	C	1	210-120-1A	A5	CK	C	2	-	-	O	FS	RO	-	J12	SE-ST-CH-3003
HCV-204	CH	A	2	210-120-2	A2	GL	A	2	NO	FC	L	LT	2YR	-	E5	APPENDIX J
HCV-204	CH	A	2	210-120-2	A2	GL	A	2	NO	FC	C	ST	CS	Y	J13	OP-ST-CH-3005
HCV-204	CH	A	2	210-120-2	A7	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SI-204	SI	A/C	1	210-130-2A	D3	CK	C	2	-	-	O	FS	RO	-	J10	OP-ST-SI-3007
SI-204	SI	A/C	1	210-130-2A	D3	CK	C	2	-	-	L	LT	CS*	-	-	PIV SE-ST-SI-3015
CH-205	CH	C	1	210-120-1A	B6	CK	C	2	-	-	O	PS	Q	-	J14	OP-ST-CH-3006
CH-205	CH	C	1	210-120-1A	B6	CK	C	2	-	-	O	FS	RO	-	J14	SE-ST-CH-3003
SI-205	SI	C	1	210-130-2A	C4	CK	C	2	-	-	O	PS	CS	-	J11	OP-ST-SI-3014
SI-205	SI	C	1	210-130-2A	C4	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-SI-3007
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	C	ST	CS	Y	J15	OP-ST-CH-3005
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-206	CH	A	2	210-120-1A	E1	GL	A	0.75	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3008
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-207	SI	A/C	1	210-130-2A	F7	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-208	SI	A/C	1	210-130-2A	C7	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-209	SI	C	2	210-130-2B	E3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3005
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3008
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-211	SI	A/C	1	210-130-2A	F6	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-212	SI	A/C	1	210-130-2A	C6	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-213	SI	C	2	210-130-2B	E6	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3005
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3008
SI-215	SI	A/C	1	210-130-2A	F4	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3013
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3013
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
SI-216	SI	A/C	1	210-130-2A	C4	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
SI-217	SI	C	2	210-130-2	E6	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3005
FO-218	FO	C	3	M-262-1	B3	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-FO-3001
LCV-218-2	CH	B	2	210-120-1	C2	GA	M	4	NO	FAI	C	ST	CS	Y	J16	OP-ST-CH-3005
LCV-218-2	CH	B	2	210-120-1	C2	GA	M	4	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
LCV-218-3	CH	B	2	210-120-1	E3	GA	M	3	NC	FAI	O	ST	CS	Y	J16	OP-ST-CH-3005
LCV-218-3	CH	B	2	210-120-1	E3	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
FO-219	FO	C	3	M-262-1	B3	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-FO-3002
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	C	FS	CS*	-	E4	OP-ST-SI-3008
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	L	LT	CS*	-	-	PIV OP-ST-SI-3008
SI-219	SI	A/C	1	210-130-2A	F3	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST-SI-3015
RW-220	RW	C	3	M-100-1	F3	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3008
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	O	FS	RO	-	E4	SIT DUMP SS-ST SI-3015
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	C	FS	CS*	-	E4	PIV OP-ST-SI-3013
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	L	LT	CS*	-	-	OP-ST-SI-3013
SI-220	SI	A/C	1	210-130-2A	C3	CK	C	12	-	-	O	PS	CS	-	E4	OP-ST-SI-3003
RW-221	RW	C	3	M-100-1	E3	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3008
SI-221	SI	C	2	210-130-2	E3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3005
RW-222	RW	C	3	M-100-1	D3	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3008
RW-223	RW	C	3	M-100-1	C3	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3008
HCV-238	CH	B	1	210-120-1A	D5	GL	A	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-238	CH	B	1	210-120-1A	D5	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-238	CH	B	1	210-120-1A	C5	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-239	CH	B	1	210-120-1A	A5	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	C	ST	CS	Y	J17	OP-ST-CH-3005
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	O	ST	CS	Y	J17	OP-ST-CH-3005
HCV-240	CH	B	1	210-120-1A	B5	GL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SW-240	SW	A/C	3	M-259-2	B4	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-RW-3001
SW-240	SW	A/C	3	M-259-2	B4	CK	C	0.5	-	-	L	LT	2YR	-	-	IC-ST-RW-3001
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	C	ST	CS	Y	J15	OP-ST-CH-3005
HCV-241	CH	A	2	210-120-1A	E5	GL	A	0.75	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SW-241	SW	A/C	3	M-259-2	B5	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-RW-3001
SW-241	SW	A/C	3	M-259-2	B5	CK	C	0.5	-	-	L	LT	2YR	-	-	IC-ST-RW-3001
SW-242	SW	A/C	3	M-259-2	B6	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-RW-3001
SW-242	SW	A/C	3	M-259-2	B6	CK	C	0.5	-	-	L	LT	2YR	-	-	IC-ST-RW-3001
SW-243	SW	A/C	3	M-259-2	B7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-RW-3001
SW-243	SW	A/C	3	M-259-2	B7	CK	C	0.5	-	-	L	LT	2YR	-	-	IC-ST-RW-3001
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-247	CH	B	2	210-120-1A	C5	GL	S	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-248	CH	B	2	210-120-1A	A5	GL	S	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	O	ST	CS	Y	J17	OP-ST-CH-3005
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	C	ST	CS	Y	J17	OP-ST-CH-3005
HCV-249	CH	B	1	210-120-1A	B5	GL	S	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3009
SA-252	SA	C	3	B120F07001-2	D5	CK	C	0.25	-	-	C	FS	Q	-	-	DG START ACCEPT OP-ST-DG-0002
SA-253	SA	C	3	B120F07001-2	D5	CK	C	0.25	-	-	C	FS	Q	-	-	DG START ACCEPT OP-ST-DG-0002
RW-254	RW	A/C	3	M-100-1	C4	CK	C	0.75	-	-	O	FS	Q	-	-	IC-ST-RW-3001
RW-255	RW	A/C	3	M-100-1	E4	CK	C	0.75	-	-	O	FS	Q	-	-	IC-ST-RW-3001
RW-256	RW	A/C	3	M-100-1	D4	CK	C	0.75	-	-	O	FS	Q	-	-	IC-ST-RW-3001
HCV-257	CH	B	2	210-121-1	D7	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-257	CH	B	2	210-121-1	D7	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
RW-257	RW	A/C	3	M-100-1	E5	CK	C	0.75	-	-	O	FS	Q	-	-	IC-ST-RW-3001
HCV-258	CH	B	2	210-121-1	B5	GA	M	3	NC	FAI	O	ST	Q	Y	-	OP-ST-CH-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-258	CH	B	2	210-121-1	B5	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-264	CH	B	2	210-121-1	D4	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-CH-3001
HCV-264	CH	B	2	210-121-1	D4	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-265	CH	B	2	210-121-1	B3	GA	M	3	NC	FAI	O	ST	Q	Y	-	OP-ST-CH-3001
HCV-265	CH	B	2	210-121-1	B3	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3008
HCV-268	CH	B	2	210-121-2	B4	GA	M	3	NC	FAI	O	ST	CS	Y	J18	OP-ST-CH-3005
HCV-268	CH	B	2	210-121-2	B4	GA	M	3	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3009
FCV-269	CH	B	2	210-121-1	C7	GL	A	3	A	FC	C	ST	Q	Y	-	OP-ST-CH-3001
FCV-269	CH	B	2	210-121-1	C7	GL	A	3	A	FC	-	VPI	2YR	Y	-	OP-ST-VX-3008
MS-275	MS	C	2	M-252-1	F8	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-276	MS	C	2	M-252-1	F8	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-277	MS	C	2	M-252-1	F7	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-278	MS	C	2	M-252-1	F7	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-279	MS	C	2	M-252-1	E8	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-280	MS	C	2	M-252-1	E7	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
VA-280	VA	A	2	M-1-2	A8	BU	H	4	LC	-	L	LT	2YR	-	-	APPENDIX J
MS-281	MS	C	2	M-252-1	E7	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
MS-282	MS	C	2	M-252-1	E6	RL	R	6	-	-	T	SP	RO	-	-	SS-ST-MS-3003
SA-282	SA	C	3	B120F07001-1	B7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
AC-283	CCW	C	2	M-40-1	G7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007
AC-284	CCW	C	2	M-40-1	G7	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007
AC-285	CCW	C	2	M-40-1	F6	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007
SA-285	SA	C	3	B120F07001-1	F7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
AC-286	CCW	C	2	M-40-1	F5	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3007
VA-287	VA	C	3	M-1-2	B6	RL	R	2	-	-	T	SP	OM	-	-	PE-ST-VX-3010
SA-288	SA	C	3	B120F07001-2	B7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
VA-288	VA	C	3	M-1-2	B5	RL	R	2	-	-	T	SP	OM	-	-	PE-ST-VX-3010
VA-289	VA	A	2	M-1-2	A8	BU	H	4	LC	-	L	LT	2YR	-	-	APPENDIX J
MS-291	MS	C	2	M-252-1	F7	RL	R	2.5	-	-	T	SP	RO	-	-	SS-ST-MS-3004
SA-291	SA	C	3	B120F07001-2	F7	CK	C	0.5	-	-	C	FS	Q	-	-	IC-ST-SA-3001
MS-292	MS	C	2	M-252-1	E7	RL	R	2.5	-	-	T	SP	RO	-	-	SS-ST-MS-3004
SI-298	SI	C	2	210-130-1	D3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3009
SI-299	SI	C	2	210-130-1	D4	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3009
SI-300	SI	C	2	210-130-1	B4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-301	SI	C	2	210-130-1	D4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-302	SI	C	2	210-130-1	F4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-303	SI	C	2	210-130-1	E4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-304	SI	C	2	210-130-1	A4	CK	C	2	-	-	O	FS	Q	-	-	OP-ST-SI-3008
SI-306	SI	A	2	210-130-1	D7	GA	H	6	LC	-	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-308	SI	B	2	210-130-1	D6	GA	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-308	SI	B	2	210-130-3	D6	GA	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
SI-309	SI	C	2	210-130-1	D5	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3009
SI-310	SI	C	2	210-130-1	D3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3009
HCV-311	SI	B	2	210-130-2A	C3	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-311	SI	B	2	210-130-2A	C3	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-312	SI	B	2	210-130-2A	C4	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-312	SI	B	2	210-130-2A	C4	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-314	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-314	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-315	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-315	SI	B	2	210-130-2A	C5	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-317	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-317	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-318	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-318	SI	B	2	210-130-2A	C8	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-320	SI	B	2	210-130-2A	C6	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-320	SI	B	2	210-130-2A	C6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-321	SI	B	2	210-130-2A	C7	GL	M	2	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-321	SI	B	2	210-130-2A	C7	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
SI-323	SI	C	2	210-130-3	E6	CK	C	4	-	-	O	FS	RO	-	J20	OP-ST-SI-3007
SI-323	SI	C	2	210-130-3	E6	CK	C	4	-	-	C	FS	RO	-	J20	SE-ST-SI-3010
HCV-327	SI	B	2	210-130-2A	C3	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-327	SI	B	2	210-130-2A	C3	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-329	SI	B	2	210-130-2A	C4	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-329	SI	B	2	210-130-2A	C4	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-331	SI	B	2	210-130-2A	C7	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-331	SI	B	2	210-130-2A	C7	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-333	SI	B	2	210-130-2A	C6	GL	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-333	SI	B	2	210-130-2A	C6	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3018
AC-341	CCW	C	3	M-10-2	C3	RL	R	1	-	-	T	SP	OM	-	-	PE-ST-VX-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
SI-342	SI	A	2	210-130-1	E7	GL	H	1	LC	-	L	LT	2YR	-	-	SE-ST-SI-3005
SI-343	SI	C	2	210-130-3	D6	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-CH-3006
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	O	ST	CS	Y	J21	OP-ST-SI-3002
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	C	ST	CS	Y	J21	OP-ST-SI-3002
HCV-344	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3019
NG-HCV-344-S2	NG	C	2	C-4175-5	E2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-345	SI	B	2	210-130-1	B8	BL	A	8	NC	FO	O	ST	CS	Y	J21	OP-ST-SI-3002
HCV-345	SI	B	2	210-130-1	D8	BL	A	8	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	C	ST	CS	Y	J22	OP-ST-SI-3002
HCV-347	SI	A	1	210-130-3	F7	GA	M	10	LC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	C	ST	CS	Y	J22	OP-ST-SI-3002
HCV-348	SI	A	1	210-130-2A	C2	GA	M	12	LC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
MS-351	MS	C	3	M-252-1	E5	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
MS-352	MS	C	3	M-252-1	E5	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
AC-364	CCW	C	3	M-10-2	D4	RL	R	2	-	-	T	SP	OM	-	-	PE-ST-VX-3001
HCV-383-3	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	O	ST	CS	Y	J40	OP-ST-SI-3002
HCV-383-3	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-383-3	SI	A	2	210-130-1	D1	BU	M	24	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-383-4	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	O	ST	CS	Y	J40	OP-ST-SI-3002
HCV-383-4	SI	A	2	210-130-3	B7	BU	M	24	NC	FAI	L	LT	2YR	-	-	APPENDIX J
HCV-383-4	SI	A	2	210-130-1	D1	BU	M	24	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	C	ST	CS	Y	J40	OP-ST-SI-3002
LCV-383-1	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	O	ST	CS	Y	J40	OP-ST-SI-3002
LCV-383-1	SI	A	2	210-130-1	D1	BU	A	20	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	O	ST	CS	Y	J40	OP-ST-SI-3002
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	C	ST	CS	Y	J40	OP-ST-SI-3002
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
LCV-383-2	SI	A	2	210-130-1	D2	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
NG-LCV-383-1-S2	NG	C	3	C-4175-5	E2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3006
NG-LCV-383-2-S2	NG	C	3	C-4175-5	E2	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	O	ST	CS	Y	J34	OP-ST-SI-3006
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	C	ST	CS	Y	J34	OP-ST-SI-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-385	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	C	ST	CS	Y	J34	OP-ST-SI-3002
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	O	ST	CS	Y	J34	OP-ST-SI-3002
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	L	LT	2YR	-	-	SE-ST-SI-3005
HCV-386	SI	A	2	210-130-1	F4	GL	A	4	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3018
AC-391	CCW	A/C	3	M10 SH. 2	B4	CK	C	15	-	-	O	FS	Q	-	-	SE-ST-CCW-3003
AC-391	CCW	A/C	3	M10 SH. 2	B4	CK	C	15	-	-	C	FS	Q	-	-	SE-ST-CCW-3003
AC-391	CCW	A/C	3	M10 SH. 2	B4	CK	C	15	-	-	L	LT	Q	-	-	SE-ST-CCW-3003
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-400A-S2	NG	C	3	C-4175-6	F2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-400B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-400B-S2	NG	C	3	C-4175-6	F2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400C	CCW	B	2	M-40-1	D2	BL	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-400D	CCW	B	2	M-40-1	B2	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-400D	CCW	B	2	N-40-1	B2	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401A	CCW	B	2	M-40-1	C7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-401A-S2	NG	C	3	C-4175-6	F2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-401B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401B	CCW	B	2	M-40-1	B7	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-401B-S2	NG	C	3	C-4175-6	F2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-401C	CCW	B	2	M-40-1	D3	BL	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401C	CCW	B	2	M-40-1	D3	BL	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401C	CCW	B	2	M-40-1	D3	BL	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-401D	CCW	B	2	M-40-1	B3	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-401D	CCW	B	2	M-40-1	B3	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-402A	CCW	B	2	M-40-1	C6	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-402A-S2	NG	C	3	C-4175-6	E2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-402B	CCW	B	2	M-40-1	B6	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402B	CCW	B	2	M-40-1	B6	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-402B-S2	NG	C	3	C-4175-6	E2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-402C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402C	CCW	B	2	M-40-1	D4	FL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-402D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-402D	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403A	CCW	B	2	M-40-1	C5	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-403A-S2	NG	C	3	C-4175-6	E2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-403B	CCW	B	2	M-40-1	B5	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403B	CCW	B	2	M-40-1	B5	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
NG-HCV-403B-S2	NG	C	3	C-4175-6	E2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403C	CCW	B	2	M-40-1	D4	BL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-403D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3005
HCV-403D	CCW	B	2	M-40-1	B4	BU	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3007
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-425A	CCW	A	2	M-40-3	C6	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425B	CCW	A	2	M-40-1	D1	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-425C	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-425D	CCW	A	2	M-40-3	B5	GL	A	3	NO	FC	C	ST	CS	Y	J23	OP-ST-CCW-3004
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	L	LT	2YR	-	-	APPENDIX J
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438A	CCW	A	2	M-40-2	F8	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	L	LT	2YR	-	-	APPENDIX J
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438B	CCW	A	2	M-40-1	A6	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
NG-HCV-438B-S2	NG	C	3	C-4175-6	D2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	L	LT	2YR	-	-	APPENDIX J
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438C	CCW	A	2	M-40-2	F2	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	C	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	L	LT	2YR	-	-	APPENDIX J
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	O	ST	CS	Y	J24	OP-ST-CCW-3004
HCV-438D	CCW	A	2	M-40-1	A3	GL	A	6	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
NG-HCV-438D-S2	NG	C	3	C-4175-6	D2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	C	ST	Q	Y	-	OP-ST-CCW-3004
HCV-467A	CCW	A	2	M-40-3	E3	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	C	ST	Q	Y	-	OP-ST-CCW-3004
HCV-467B	CCW	A	2	M-40-1	A3	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	C	ST	Q	Y	-	OP-ST-CCW-3004
HCV-467C	CCW	A	2	M-40-3	E1	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	C	ST	Q	Y	-	OP-ST-CCW-3004
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-467D	CCW	A	2	M-40-1	A2	GL	A	1.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3006
CH-469	CH	C	1	210-120-1A	B5	CK	C	2	-	-	O	PS	CS	-	J11	SE-ST-CH-3003
CH-469	CH	C	1	210-120-1A	B5	CK	C	2	-	-	O	FS	RO	-	J11	OP-ST-CH-3003
HCV-474	CCW	B	3	M-10-3	F8	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-474	CCW	B	3	M-10-3	F8	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3006
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-CCW-3001
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-478	CCW	B	3	M-10-3	D2	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-480	CCW	B	3	M-10-3	C6	BU	A	14	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-480	CCW	B	3	M-10-3	C6	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
NG-HCV-480-S2	NG	C	3	C-4175-6	B2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-481	CCW	B	3	M-10-3	B7	BU	A	14	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-481	CCW	B	3	M-10-3	B7	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
NG-HCV-481-S2	NG	C	3	C-4175-6	B2	RL	R	0.25	-	-	T	SP	OM	-	-	PE-ST-VX-3006
HCV-482A	RW	B	3	M-10-3	C5	BU	A	14	NC	FO	Q	ST	RO	Y	J41	OP-ST-RW-3003
HCV-482A	RW	B	3	M-10-3	C5	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-482B	RW	B	3	M-10-3	A4	BU	A	14	NC	FO	Q	ST	RO	Y	J41	OP-ST-RW-3003
HCV-482B	RW	B	3	M-10-3	A4	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-483A	RW	B	3	M-10-3	B7	BU	A	14	NC	FO	Q	ST	RO	Y	J41	OP-ST-RW-3003
HCV-483A	RW	B	3	M-10-3	B7	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-483B	RW	B	3	M-10-3	A5	BU	A	14	NC	FO	Q	ST	RO	Y	J41	OP-ST-RW-3003
HCV-483B	RW	B	3	M-10-3	A5	BU	A	14	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-484	CCW	B	3	M-10-3	B4	BU	A	14	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-484	CCW	B	3	M-10-3	B4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-485	CCW	B	3	M-10-3	A5	BU	A	14	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-485	CCW	B	3	M-10-3	A5	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-489A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-489A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-489B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-489B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-490A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-490A	CCW	B	3	M-10-3	B2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-490B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-490B	CCW	B	3	M-10-2	A6	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-491A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-491A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-491B	CCW	B	3	M-10-2	B6	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-491B	CCW	B	3	M-10-2	B6	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-492A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-492A	CCW	B	3	M-10-3	C2	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-492B	CCW	B	3	M-10-2	C6	BU	A	10	NO	FO	Q	ST	Q	Y	-	OP-ST-CCW-3001
HCV-492B	CCW	B	3	M-10-2	C6	BU	A	10	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-500A	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-500B	WD	A	2	M-6-2	A6	DI	A	4	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-506A	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-506B	WD	A	2	M-7-1	A6	DI	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-507A	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-507B	WD	A	2	M-98-3	F7	DI	A	3	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-508A	WD	A	2	M-98-3	C7	DI	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-508B	WD	A	2	M-98-3	C6	DI	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-509A	WD	A	2	M-98-3	B7	DI	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	C	ST	Q	Y	-	OP-ST-WDL-3001
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	L	LT	2YR	-	-	APPENDIX J
HCV-509B	WD	A	2	M-98-3	B6	DI	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3025
CA-555	CA	A	2	M-13	F3	GA	H	4	NO	-	L	LT	2YR	-	-	APPENDIX J
FW-658	AFW	C	3	M-254-2	D5	CK	C	1.5	-	-	C	ME	Q	-	-	MANUALLY EXERCISE OP-ST-AFW-3006
FW-658	AFW	C	3	M-254-2	D5	CK	C	1.5	-	-	O	ME	Q	-	-	MANUALLY EXERCISE OP-ST-AFW-3006
FW-672	AFW	C	3	M-253-4	B6	CK	C	2	-	-	O	FS	Q	-	-	SE-ST-AFW-3006
A/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
B/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
C/HCV-742	VA	A	2	M-1-2	D8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
D/HCV-742	VA	A	2	M-1-2	C8	DI	A	1	NO	FO	L	LT	2YR	-	-	APPENDIX J
PCV-742A	VA	A	2	M-1-1	D2	BU	A	42	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742B	VA	A	2	M-1-2	C7	BU	A	42	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742C	VA	A	2	M-1-1	C2	BU	A	42	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742D	VA	A	2	M-1-2	B8	BU	A	42	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742E	VA	A	2	M-1-1	F2	[illegible]	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742E	VA	A	2	M-1-1	F2	[illegible]	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
PCV-742E	VA	A	2	M-1-1	F2	[illegible]	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742F	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	A	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	A	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742G	VA	A	2	M-1-1	E2	DI	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	C	ST	Q	Y	-	OP-ST-VA-3001
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	L	LT	2YR	-	-	APPENDIX J
PCV-742H	VA	A	2	M-1-2	E8	DI	A	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-746A	VA	A	2	M-1-1	D2	BL	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-746A	VA	A	2	M-1-1	D2	BL	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-746A	VA	A	2	M-1-1	D2	BL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-746B	VA	A	2	M-1-2	C7	BL	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-CA-3001
HCV-746B	VA	A	2	M-1-2	C7	BL	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-746B	VA	A	2	M-1-2	C7	BL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-820A	VA	A	2	M-1-2	B8	GL	S	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-820B	VA	A	2	M-1-1	C2	GL	S	1	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-821A	VA	A	2	M-1-2	A8	GL	S	1	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-821B	VA	A	2	M-1-1	A2	GL	S	1	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-881	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-882	VA	A	2	M-1-1	B2	BU	A	4	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-883A	VA	A	2	M-1-1	C2	PG	A	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-883B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	O	ST	Q	Y	-	OP-ST-VA-3001
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	L	LT	2YR	-	-	APPENDIX J
HCV-884A	VA	A	2	M-1-1	C2	GL	A	1	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	C	ST	Q	Y	-	OP-ST-VA-3001
HCV-884B	VA	A	2	M-1-2	B8	GL	S	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3024
HCV-1041A	MS	B	2	M-252-1	F6	CK	A	28	NO	FC	C	ST	CS	Y	J26	OP-ST-MS-3002
HCV-1041A	MS	B	2	M-252-1	F6	CK	A	28	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1041B	MS	C	2	M-252-1	F6	CK	C	28	-	-	C	SD	RO*	-	J39	SE-ST-MS-3003
HCV-1041C	MS	B	2	M-252-1	F6	GL	M	2	NC	FAI	C	ST	CS	Y	J27	OP-ST-MS-3002
HCV-1041C	MS	B	2	M-252-1	F6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1042A	MS	B	2	M-252-1	E6	CK	A	28	NO	FC	C	ST	CS	Y	J26	OP-ST-MS-3002
HCV-1042A	MS	B	2	M-252-1	E6	CK	A	28	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3013
HCV-1042B	MS	C	2	M-252-1	E6	CK	C	28	-	-	C	SD	RO*	-	J39	SE-ST-MS-3003
HCV-1042C	MS	B	2	M-252-1	E6	GL	M	2	NC	FAI	C	ST	CS	Y	J27	OP-ST-MS-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-1042C	MS	B	2	M-252-1	E6	GL	M	2	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3013
YCV-1045	MS	B	3	M-252-1	C5	GL	A	2	NC	FO	O	ST	Q	Y	-	SE-ST-AFW-3006
YCV-1045	MS	B	3	M-252-1	C5	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	O	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	C	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045A	MS	B	2	M-252-1	F5	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3012
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	O	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	C	ST	Q	Y	-	OP-ST-MS-3001
YCV-1045B	MS	B	2	M-252-1	E5	GL	A	2	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3012
HCV-1103	FW	B	N	M-253-1	C3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1103	FW	B	N	M-253-1	C3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1104	FW	B	N	M-253-1	E3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1104	FW	B	N	M-253-1	E3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1105	FW	B	N	M-253-1	D3	GL	A	6	NC	FC	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1105	FW	B	N	M-253-1	D3	GL	A	6	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1106	FW	B	N	M-253-1	E3	GL	A	6	NC	FC	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1106	FW	B	N	M-253-1	E3	GL	A	6	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1107A	AFW	B	2	M-253-1	F8	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1107A	AFW	B	2	M-253-1	F8	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1107B	AFW	B	2	M-253-4	E8	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1107B	AFW	B	2	M-253-4	E8	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1108A	AFW	B	2	M-253-4	F7	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1108A	AFW	B	2	M-253-4	F7	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1108B	AFW	B	2	M-253-4	E7	GL	A	3	NC	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1108B	AFW	B	2	M-253-4	E7	GL	A	3	NC	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
FCV-1368	AFW	B	3	M-253-4	C6	GL	A	1	A	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
FCV-1368	AFW	B	3	M-253-4	C6	GL	A	1	A	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
FCV-1369	AFW	B	3	M-253-4	B5	GL	A	2	A	FO	-	VPI	2YR	Y	-	OP-ST-VX-3002
FCV-1369	AFW	B	3	M-253-4	B5	GL	A	2	A	FO	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1384	AFW	B	3	M-253-4	D7	GA	M	4	NC	FAI	O	ST	Q	Y	-	OP-ST-AFW-3006
HCV-1384	AFW	B	3	M-253-4	D7	GL	M	4	NC	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3002
HCV-1385	FW	B	2	M-253-1	D3	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1385	FW	B	2	M-253-1	D3	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1386	FW	B	2	M-253-1	C6	GA	M	16	NO	FAI	C	ST	CS	Y	J28	OP-ST-FW-3002
HCV-1386	FW	B	2	M-253-1	C6	GA	M	16	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3011

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-1387A	FW	B	2	M-253-1	C3	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-FW-3002
HCV-1387A	FW	B	2	M-253-1	C3	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1387B	FW	B	2	M-253-1	B3	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-FW-3002
HCV-1387B	FW	B	2	M-253-1	B3	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1388A	FW	B	2	M-253-1	C8	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-FW-3002
HCV-1388A	FW	B	2	M-253-1	C8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
HCV-1388B	FW	B	2	M-253-1	B8	GL	A	2	NO	FC	C	ST	Q	Y	-	OP-ST-FW-3002
HCV-1388B	FW	B	2	M-253-1	B8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3011
FW-1443	FW	C	3	M-253-4	B5	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3003
FW-1444	FW	C	3	M-253-4	B5	RL	R	0.75	-	-	T	SP	OM	-	-	PE-ST-VX-3003
FW-1525	AFW	C	3	M-253-4	B4	RL	R	0.75	-	-	T	SP	OM*	-	E6	PE-ST-VX-3003
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1559A	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1559B	DW	A	2	M-5-2	E5	DI	A	2.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1560A	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	C	ST	Q	Y	-	OP-ST-DW-3001
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1560B	DW	A	2	M-5-2	A4	DI	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3010
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NC	FC	C	ST	Q	Y	-	OP-ST-CA-3001
HCV-1749	CA	A	2	M-13	F4	GL	A	4	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3003
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	L	LT	2YR	-	-	APPENDIX J
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	C	ST	CS	Y	J30	OP-ST-CA-3002
PCV-1849A	IA	A	2	M-264-1	C8	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3004
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	L	LT	2YR	-	-	APPENDIX J
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	C	ST	CS	Y	J30	OP-ST-CA-3002
PCV-1849B	IA	A	2	M-264-1	F5	GL	A	2	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3004
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	C	ST	Q	Y	-	OP-ST-SL-3001
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2504A	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3021

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	C	ST	Q	Y	-	OP-ST-SL-3001
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2504B	SL	A	2	M-12-1	F7	GL	A	0.5	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3021
HCV-2506A	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2506A	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2506B	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2506B	SL	B	2	M-12-1	D7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2507A	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2507A	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2507B	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	C	ST	CS	Y	J31	OP-ST-SL-3002
HCV-2507B	SL	B	2	M-12-1	C7	GL	A	0.5	NO	FC	-	VPI	2YR	Y	-	OP-ST-VX-3022
HCV-2603A	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2603A	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2603A	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2603B	NG	A	2	M-42-1	D8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2604A	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2604A	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2604A	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-NG-3001
HCV-2604B	NG	A	2	M-42-1	D5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3014
HCV-2808A	CCW	B	3	M-10-4	E5	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2808A	CCW	B	3	M-10-4	E5	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2808B	CCW	B	3	M-10-4	B5	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2808B	CCW	B	3	M-10-4	B5	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2808C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2808C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2808D	RW	B	3	M-10-4	A5	GL	A	1.5	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2808D	RW	B	3	M-10-4	A5	GL	A	1.5	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2809A	CCW	B	3	M-10-4	E4	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2809A	CCW	B	3	M-10-4	E4	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2809B	CCW	B	3	M-10-4	B4	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2809B	CCW	B	3	M-10-4	B4	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2809C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2809C	RW	B	3	M-10-4	D5	GL	A	1.5	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2809D	RW	B	3	M-10-4	B4	GL	A	1.5	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2809D	RW	B	3	M-10-4	B4	GL	A	1.5	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2810A	CCW	B	3	M-10-4	E3	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2810A	CCW	B	3	M-10-4	E3	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2810B	CCW	B	3	M-10-4	B3	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2810B	CCW	B	3	M-10-4	B3	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2811A	CCW	B	3	M-10-4	E2	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2811A	CCW	B	3	M-10-4	E2	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2811B	CCW	B	3	M-10-4	B2	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2811B	CCW	B	3	M-10-4	B2	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2812A	CCW	B	3	M-10-4	E1	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2812A	CCW	B	3	M-10-4	E1	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2812B	CCW	B	3	M-10-4	B1	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2812B	CCW	B	3	M-10-4	B1	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2813A	CCW	B	3	M-10-4	E6	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2813A	CCW	B	3	M-10-4	E6	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2813B	CCW	B	3	M-10-4	B6	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2813B	CCW	B	3	M-10-4	B6	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2814A	CCW	B	3	M-10-4	E8	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2814A	CCW	B	3	M-10-4	E8	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2814B	CCW	B	3	M-10-4	B8	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2814B	CCW	B	3	M-10-4	B8	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2815A	CCW	B	3	M-10-4	E7	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2815A	CCW	B	3	M-10-4	E7	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2815B	CCW	B	3	M-10-4	B7	GL	A	1.5	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2815B	CCW	B	3	M-10-4	B7	GL	A	1.5	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2850	RW	B	3	M-100-1	B7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2850	RW	B	3	M-100-1	B7	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2851	RW	B	3	M-100-1	B6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2851	RW	B	3	M-100-1	B6	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2852	RW	B	3	M-100-1	B5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2852	RW	B	3	M-100-1	B5	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2853	RW	B	3	M-100-1	B4	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2853	RW	B	3	M-100-1	B4	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874A	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2874B	RW	B	3	M-100-1	C7	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875A	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2875B	RW	B	3	M-100-1	C6	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876A	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2876B	RW	B	3	M-100-1	C5	BU	A	20	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877A	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2877B	RW	B	3	M-100-1	E4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878A	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2878B	RW	B	3	M-100-1	D4	BU	A	8	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879A	RW	B	3	M-100-1	C4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2879B	RW	B	3	M-100-1	B4	BU	A	14	NO	FO	C	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880A	RW	B	3	M-100-1	E3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880A	RW	B	3	M-100-1	E3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2880B	RW	B	3	M-100-1	E1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2880B	RW	B	3	M-100-1	E1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2881A	RW	B	3	M-100-1	C3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2881A	RW	B	3	M-100-1	C3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2881B	RW	B	3	M-100-1	C1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2881B	RW	B	3	M-100-1	C1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2882A	RW	B	3	M-100-1	F3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2882A	RW	B	3	M-100-1	F3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2882B	RW	B	3	M-100-1	F1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2882B	RW	B	3	M-100-1	F1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2883A	RW	B	3	M-100-1	B3	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2883A	RW	B	3	M-100-1	B3	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2883B	RW	B	3	M-100-1	B1	BU	A	12	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2883B	RW	B	3	M-100-1	B1	BU	A	12	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2893	RW	B	3	M-100-1	B5	BU	A	16	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2893	RW	B	3	M-100-1	B5	BU	A	16	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2894	RW	B	3	M-100-1	C5	BU	A	16	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3017
HCV-2894	RW	B	3	M-100-1	C5	BU	A	16	NO	FO	O	ST	Q	Y	-	OP-ST-RW-3002
HCV-2898A	CCW	B	3	M-10-1	D6	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2898A	CCW	B	3	M-10-1	D6	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2898B	CCW	B	3	M-10-1	D4	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2898B	CCW	B	3	M-10-1	D4	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2898C	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2898C	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2898D	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2898D	RW	B	3	M-10-1	D6	GL	A	2	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2899A	CCW	B	3	M-10-1	C6	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2899A	CCW	B	3	M-10-1	C6	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2899B	CCW	B	3	M-10-1	C4	GL	A	2	NO	FO	O	ST	Q	Y	-	OP-ST-CCW-3001
HCV-2899B	CCW	B	3	M-10-1	C4	GL	A	2	NO	FO	-	VPI	2YR	Y	-	OP-ST-VX-3005
HCV-2899C	RW	B	3	M-10-1	C6	GL	A	2	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2899C	RW	B	3	M-10-1	C6	GL	A	2	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
HCV-2899D	RW	B	3	M-10-1	C4	GL	A	2	NC	FO	O	ME	RO	-	J41	OP-ST-RW-3003
HCV-2899D	RW	B	3	M-10-1	C4	GL	A	2	NC	FO	C	ME	RO	-	J41	OP-ST-RW-3003
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2909	SI	A	2	210-130-2	B5	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2916	SI	A	2	210-130-2	C5	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2929	SI	A	2	210-130-2	B8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2936	SI	A	2	210-130-2	C7	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2949	SI	A	2	210-130-2B	B8	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2956	SI	A	2	210-130-2B	C7	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
PCV-2969	SI	A	2	210-130-2B	B4	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
PCV-2969	SI	A	2	210-130-2B	B4	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
PCV-2969	SI	A	2	210-130-2B	B4	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2976	SI	A	2	210-130-2B	C4	GL	A	1	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2983	SI	A	2	210-130-1	E8	GL	A	2	NC	FC	L	LT	2YR	-	-	APPENDIX J
HCV-2983	SI	A	2	210-130-1	E8	GL	A	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3018
HCV-2983	SI	A	2	210-130-1	E8	GL	A	2	NC	FC	C	ST	Q	-	-	OP-ST-SI-3001
HCV-2987	SI	B	2	210-130-3	E7	GA	P	4	NO	FO	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2987	SI	B	2	210-130-3	E7	GA	P	4	NO	FO	O	ST	Q	Y	-	OP-ST-SI-3001
HCV-2987	SI	B	2	210-130-3	E8	GA	A	4	NO	FAI	-	VPI	2YR	Y	-	OP-ST-VX-3019
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	C	ST	Q	Y	-	OP-ST-SI-3001
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	O	ST	Q	Y	-	OP-ST-SI-3001

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
HCV-2988	SI	B	2	210-130-3	D6	GL	S	2	NC	FC	-	VPI	2YR	Y	-	OP-ST-VX-3019
IA-HCV-238-C	IA	C	3	C-4175-8	F7	CK	C	0.5	-	-	O	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-238-C	IA	C	3	C-4175-8	F7	CK	C	0.5	-	-	C	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-239-C	IA	C	3	C-4175-8	F7	CK	C	0.5	-	-	O	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-239-C	IA	C	3	C-4175-8	F7	CK	C	0.5	-	-	C	FS	CS	-	J33	NOTE 3 IC-ST-IA-3002
IA-HCV-240-C	IA	C	3	C-4175-8	E7	CK	C	0.5	-	-	C	FS	CS	-	J17	NOTE 1 IC-ST-IA-3002
IA-HCV-240-C	IA	C	3	C-4175-8	E7	CK	C	0.5	-	-	O	FS	CS	-	J17	NOTE 1 IC-ST-IA-3002
IA-HCV-344-C	IA	C	2	C-4175-5	E7	CK	C	0.5	-	-	O	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-HCV-344-C	IA	C	2	C-4175-5	E7	CK	C	0.5	-	-	C	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-HCV-345-C	IA	C	2	C-4175-5	E7	CK	C	0.5	-	-	O	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-HCV-345-C	IA	C	2	C-4175-5	E7	CK	C	0.5	-	-	C	FS	CS	-	J21	NOTE 1 OP-ST-SI-3002
IA-A/FIC-383-C	IA	C	2	M-264-4	D3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-A/FIC-383-C	IA	C	3	M-264-4	D3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-B/FIC-383-C	IA	C	3	M-264-4	B3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-B/FIC-383-C	IA	C	3	M-264-4	B3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-C/FIC-383-C	IA	C	3	M-264-4	C3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-C/FIC-383-C	IA	C	3	M-264-4	C3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-D/FIC-383-C	IA	C	3	M-264-4	A3	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-D/FIC-383-C	IA	C	3	M-264-4	A3	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 2 IC-ST-IA-3001
IA-LCV-383-1-C	IA	C	3	C-4175-5	E7	CK	C	0.375	-	-	O	FS	CS	-	J40	NOTE 1 OP-ST-SI-3002
IA-LCV-383-1-C	IA	C	3	C-4175-5	E7	CK	C	0.375	-	-	C	FS	CS	-	J40	NOTE 1 OP-ST-SI-3002
IA-LCV-383-2-C	IA	C	3	C-4175-5	E7	CK	C	0.375	-	-	C	FS	CS	-	J40	NOTE 1 OP-ST-SI-3002
IA-LCV-383-2-C	IA	C	3	C-4175-5	E7	CK	C	0.375	-	-	O	FS	CS	-	J40	NOTE 1 OP-ST-SI-3002
IA-HCV-385-C	IA	C	3	C-4175-5	E7	CK	C	0.5	-	-	O	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-385-C	IA	C	3	C-4175-5	E7	CK	C	0.5	-	-	C	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-386-C	IA	C	3	C-4175-5	E7	CK	C	0.5	-	-	O	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-386-C	IA	C	3	C-4175-5	E7	CK	C	0.5	-	-	C	FS	CS	-	J34	NOTE 1 IC-ST-IA-3004
IA-HCV-400A-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400A-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400B-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400B-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400C-TV	IA	C	3	C-4175-6	F3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400C-TV	IA	C	3	C-4175-6	F3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400D-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-400D-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
IA-HCV-401A-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401A-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401B-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401B-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401C-TV	IA	C	3	C-4175-6	F3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401C-TV	IA	C	3	C-4175-6	F3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401D-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-401D-C	IA	C	3	C-4175-6	F7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402A-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402A-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402B-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402B-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402C-TV	IA	C	3	C-4175-6	E3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402C-TV	IA	C	3	C-4175-6	E3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402D-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-402D-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403A-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403A-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403B-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403B-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403C-TV	IA	C	3	C-4175-6	E3	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403C-TV	IA	C	3	C-4175-6	E3	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403D-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-403D-C	IA	C	3	C-4175-6	E7	CK	C	0.25	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-CCW-3005
IA-HCV-438B-C	IA	C	3	C-4175-6	D7	CK	C	0.5	-	-	C	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-438B-C	IA	C	3	C-4175-6	D7	CK	C	0.5	-	-	O	FS	CS	-	-	NOTE 1 OP-ST-CCW-3004
IA-HCV-438D-C	IA	C	3	C-4175-6	D7	CK	C	0.5	-	-	C	FS	CS	-	J24	NOTE 1 OP-ST-CCW-3004
IA-HCV-438D-C	IA	C	3	C-4175-6	D7	CK	C	0.5	-	-	O	FS	CS	-	-	NOTE 1 OP-ST-CCW-3004
IA-HCV-480-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-480-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-481-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-481-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-484-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-484-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-HCV-485-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
IA-HCV-485-C	IA	C	3	C-4175-6	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE #5 OP-ST-CCW-3005
IA-YCV-1045A-C	IA	C	3	C-4175-4	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045A-C	IA	C	3	C-4175-4	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045B-C	IA	C	3	C-4175-4	B7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-YCV-1045B-C	IA	C	3	C-4175-4	B7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 OP-ST-MS-3001
IA-HCV-1107A-C	IA	C	3	C-4175-8	E7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1107A-C	IA	C	3	C-4175-8	E7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1107B-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1107B-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1108A-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1108A-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1108B-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3002
IA-HCV-1108B-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3002
IA-FCV-1368-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3001
IA-FCV-1368-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3001
IA-FCV-1369-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	C	FS	CS	-	J38	IC-ST-AFW-3001
IA-FCV-1369-C	IA	C	3	C-4175-8	D7	CK	C	0.5	-	-	O	FS	CS	-	J38	IC-ST-AFW-3001
PCV-1849A-20A	IA	A	2	M-264-1	D8	GL	S	0.5	O	FC	L	LT	2YR	-	-	APPENDIX J
PCV-1849A-20B	IA	A	2	M-264-1	D8	GL	S	0.5	O	FC	L	LT	2YR	-	-	APPENDIX J
IA-HCV-2851-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2851-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2852-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2852-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2853-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2853-C	IA	C	3	C-4175-7	D7	CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3003
IA-HCV-2898A-C	IA	C	3	M-100		CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2898A-C	IA	C	3	M-100		CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2898B-C	IA	C	3	M-100		CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2898B-C	IA	C	3	M-100		CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2899A-C	IA	C	3	M-100		CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2899A-C	IA	C	3	M-100		CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2899B-C	IA	C	3	M-100		CK	C	0.5	-	-	C	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2899B-C	IA	C	3	M-100		CK	C	0.5	-	-	O	FS	Q	-	-	NOTE 6 IA-ST-IA-3008
IA-HCV-2987-C	IA	C	3	C-4175-5	C7	CK	C	0.375	-	-	O	FS	Q	-	-	NOTE 1 IC-ST-IA-3005
IA-HCV-2987-C	IA	C	3	C-4175-5	C7	CK	C	0.375	-	-	C	FS	Q	-	-	NOTE 1 IC-ST-IA-3005

TABLE 2.1 - FORT CALHOUN VALVE TEST PROGRAM MATRIX

VALVE NUMBER	SYS	CAT	CLASS	P&ID	COORD-INATES	VALVE TYPE	OPER TYPE	VALVE SIZE "	NORM POS	FAIL POS	TEST REQ	TYPE TEST	TEST FREQ	VPI TEST	CODE EXPT	REMARKS
IA-3092	IA	A	2	M-264-4	B5	GL	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-3093	IA	A	2	M-264-4	B5	GL	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-3094	IA	A	2	M-264-4	B5	BL	H	0.5	-	-	L	LT	2YR	-	-	APPENDIX J
IA-PCV-6680A-1-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3006
IA-PCV-6680A-2-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6680B-1-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6680B-2-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007
IA-PCV-6682-C	IA	C	3	P-49323	N/A	CK	C	0.5	-	-	C	FS	CS	-	J38	NOTE 4 IC-ST-IA-3007

APPENDIX 2A

JUSTIFICATION FOR TESTS FREQUENCIES OTHER THAN CODE PREFERRED

JUSTIFICATION FOR TEST FREQUENCIES OTHER THAN CODE PREFERRED

This section provides justification for alternate frequencies other than those preferred in the Code. Each frequency justification is identified by a unique number and identifies the valve(s) for which the frequency justification is presented. The specific Code test frequency requirement found to be impractical is defined and the justification for an alternative test frequency is given. Frequency justifications are numbered and referenced by number (Jx) on the Valve Test Program Matrix Table 2.1 for specific valves.

1. Frequency Justification Number J1 - Refueling Outage Justification

- Components:

  SI-100, SI-113

- Function:

  High Pressure Safety Injection (HPSI) Pump Suction Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  These valves cannot be full-stroke exercised open Quarterly during plant operation or during Cold Shutdowns, since to do so would require a flow path to the Reactor Coolant System (RCS). That flow path cannot be utilized during power operation because the High Pressure Safety Injection (HPSI) pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  Valves will be partial-stroke exercised open, using the minimum recirculation flow path Quarterly during normal operations, and full-stroke exercised open during Refueling Outages.

  This method of partial-stroke exercising open Quarterly and full-stroke exercising open during Refueling Outages is in accordance with the guidance set forth in Paragraph 4.2.1.2 O&M Part 10.

2. **Frequency Justification Number J2 - Cold Shutdown Justification**

- Components:

  PCV-102-1, PCV-102-2

- Function:

  Power Operated Relief Valves (PORV) for the Pressurizer

- Class:

  1

- Test Requirements:

  Quarterly Stroke-Timing Open and Closed

- Basis for Justification:

  These valves can only be opened or closed when there is a pressure differential across the valve. The valves have solenoid pilot valves that control their actuation. Since valves of this type have a history in the industry of sticking open and the PORVs are not credited in the safety analysis for overpressure protection during power operations, it is impractical to stroke these valves Quarterly during power operation. These valves cannot be partial-stroke tested open because they are either fully opened or fully closed.

- Alternate Testing:

  The PORVs will be stroke-timed in the open and closed direction during the transition to Cold Shutdown (primary plant pressure is between 350 - 450 psia and primary plant temperature is between 300 - 350°F) prior to entering Mode 4. The PORVs will be tested during the transition from Hot Shutdown to Cold Shutdown (as defined by FCS Technical Specifications) whenever practical, i.e., normal plant shutdown. During a Technical Specification mandated shutdown, the PORVs will be tested during plant startup prior to entering Mode 2 (when primary plant pressure is between 350 - 450 psia and primary plant temperature is between 300 - 350°F).

3. **Frequency Justification Number J3 - Refueling Outage Justification**

- Components:

  SI-102, SI-108, SI-115

- Function:

  HPSI Pump Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be full-stroke or partial-stroke exercised open or closed during plant operation, Quarterly or during Cold Shutdowns, since to do so would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required, and a low temperature overpressure condition of the RCS could result. Additionally, these valves cannot be exercised during Quarterly pump tests or miniflow because the minimum flow lines branch off upstream of the check valves and no flow occurs through these valves.

- Alternate Testing:

  Valves will be full-stroke exercised open and closed during Refueling Outages when the Reactor Vessel head is removed. This will provide an expansion volume to accommodate the flow required.

4. **Frequency Justification Number J4 - Cold Shutdown Justification**

- Components:

  SI-121, SI-129

- Function:

  Low Pressure Safety Injection (LPSI) Pump Discharge Check Valves |

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be partial-stroke or full-stroke exercised in the open or closed direction Quarterly during power operation because there is no flow path available except during shutdown cooling. Additionally, these valves cannot be exercised open or closed during Quarterly pump tests or using the miniflow line because the minimum flow lines branch off upstream of the check valves and no flow occurs through these valves.

- Alternate Testing:

  Valves will be full-stroke exercised open and closed during Cold Shutdown.

5. **Frequency Justification Number J5 - Cold Shutdown Justification**

- Components:

  CH-143, CH-155, CH-156

- Function:

  CH-143 - Charging Pump Boric Acid Supply Check Valve
  CH-155 - Charging Pump Boric Acid Gravity Feed Check Valve
  CH-156 - Charging Pump Safety Injection and Refueling Water Tank (SIRWT) Suction Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  These check valves serve to permit direct feed of concentrated boric acid solution to the charging pump suction header. These check valves cannot be full-stroke or partial-stroke exercised open Quarterly during power operation. The only flow path through these valves is into the RCS; exercising would result in injecting highly concentrated boric acid into the RCS. Injecting concentrated boric acid into the RCS during power operation could cause an uncontrolled reactivity excursion, a plant shutdown, or a plant trip.

- Alternate Testing:

  Valves will be full-stroke exercised open during Cold Shutdown in accordance with the FCS ISI Program Plan implementing procedures.

6. **Frequency Justification Number J6 - Cold Shutdown Justification**

- Components:

  FW-161, FW-162

- Function:

  Steam Generator Normal Feedwater Inlet Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Closed Direction

- Basis for Justification:

  These check valves function to prevent the loss of inventory of the Steam Generators in the event of a line break upstream between valves HCV-1386 (HCV-1385) and check valve FW-161 (FW-162). These check valves cannot be full-stroke exercised closed Quarterly during power operation because the valves FW-161 and FW-162 are the only feedwater supply flow paths to the Steam Generators. During power operation, the feedwater paths to the Steam Generators must not be isolated as this would remove the "heat sink" for the Reactor Coolant System (RCS).

- Alternate Testing:

  Valves will be full-stroke exercised closed during Cold Shutdown as defined in the FCS Technical Specifications, in accordance with the requirements of the FCS ISI Program Plan implementing procedures.

7. **Frequency Justification Number J7 - Cold Shutdown Justification**

- Components:

  FW-163, FW-164

- Function:

  Steam Generator Auxiliary Feedwater Injection Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction

- Basis For Justification:

  These check valves open for auxiliary feedwater (AFW) flow to the Steam Generators. Exercising these valves during power operation would result in cold water injection to a portion of the Steam Generators normally at 400 - 500°F, which would cause unnecessary and possibly damaging thermal stresses in the Steam Generators.

  The check valves are not required to be exercised in the closed direction, as there are two containment isolation valves upstream of each of the check valves which are normally closed. In addition, there is an AFW pump check valve upstream of the containment isolation valves which is exercised closed quarterly in accordance with the FCS ISI Program Plan. As a result of the above mentioned ISI tests, FCS has addressed adequately the concern of "thermal binding" of the AFW pumps and has determined that FW-163 and FW-164 do not provide a safety-related function in the reverse flow direction. It should also be noted that the discharge piping temperature upstream of FW-163 and FW-164 is monitored on a regular basis, further ensuring that the AFW pumps will not experience "thermal binding."

- Alternate Testing:

  These check valves are exercised open during Cold Shutdown. Since failure of these valves to function in the reverse flow direction would **not** interfere with the plant's ability to shutdown or to mitigate the consequences of an accident, these check valves shall be full-stroke exercised only in the open direction.

8. **Frequency Justification Number J8 - Cold Shutdown Justification**

- Components:

  HCV-176, HCV-177, HCV-178, HCV-179, HCV-180, HCV-181

- Function:

  Reactor Vessel Head and Pressurizer Vents

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Open and Closed

- Basis for Justification:

  These valves are intended to be used to vent the Reactor Pressure Vessel (RPV) head and pressurizer. These valves are Target Rock solenoid valves, which have a history of sticking open when exercised. This could result in a small break Loss of Coolant Accident (LOCA) if these valves are stroke-timed at power. Therefore, partial or full-stroke timing during normal operation is impractical.

- Alternate Testing:

  These valves will be stroke-timed in the open and closed directions during Cold Shutdown, in accordance with the FCS ISI Program Plan implementing procedures.

9. **Frequency Justification Number J9 - Cold Shutdown Justification**

- Components:

  SI-194, SI-197, SI-200, SI-203

- Function:

  Shutdown Cooling Injection Check Valves

- Class:

  1

- Testing Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction and Leakage Test During Cold Shutdown

- Basis for Justification:

  These check valves cannot be full-stroke exercised open or partial-stroke exercised Quarterly during power operation because no flow path is available at operating pressure due to system configuration. Since the Safety Injection (SI) pumps are not able to develop sufficient discharge pressure to overcome RCS pressure, the valves are not able to be exercised. Valves SI-194, SI-197, SI-200 and SI-203 are Pressure Isolation Valves (PIVs)as defined by NRC Generic Letter (GL) 89-04 and as listed in the FCS Technical Specifications.

- Alternate Testing:

  These check valves are full-stroke exercised open during Cold Shutdown when the Shutdown Cooling system is in service. These check valves will be leak tested during Cold Shutdown in accordance with the requirements of FCS Technical Specification 2.1, Table 2-9, and Item 14 of the table format of this Program Plan.

10. **Frequency Justification Number J10 - Refueling Outage Frequency**

- Components:

  SI-195, SI-198, SI-201, SI-204

- Function:

  High Pressure Safety Injection to Reactor Coolant Loop Check Valves

- Class:

  1

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction and Leakage Test During Cold Shutdown

- Basis for Justification:

  These check valves cannot be full-stroke or partial-stroke exercised open Quarterly during power operation because the only flow path available is into the RCS. Since the HPSI pumps do not develop sufficient discharge pressure to overcome RCS operating pressure, the valves cannot be exercised during Cold Shutdown because the RCS does not contain an adequate expansion volume and a low temperature overpressurization (LTOP) of the RCS could result. Valves SI-195, SI-198, SI-201 and SI-204 are pressure isolation valves (PIVs) as defined by NRC GL 89-04 and as listed in the FCS Technical Specifications.

- Alternate Testing:

  These check valves will be full-stroke exercised open during Refueling Outages when the RCS is depressurized and the Reactor Pressure Vessel (RPV) Head is removed in order to provide an expansion volume to accommodate the flow required. These check valves will be leak tested during Cold Shutdown in accordance with the requirements of FCS Technical Specification 2.1, Table 2-9, and Item 14 of the table format of this Program Plan.

11. Frequency Justification Number J11 - Refueling Outage Frequency

- Components:

  SI-196, SI-199, SI-202, SI-205, SI-343, CH-469

- Function:

  High Pressure Safety Injection to Reactor Coolant Loop Check Valves

- Class:

  1 - SI-196, SI-199, SI-202, SI-205, CH-469

  2 - SI-343

- Testing Requirements:

  Quarterly Full-Stroke Exercising in the Open Direction

- Basis for Justification:

  Valves SI-196, -199, -202, -205, and CH-469 function to prevent backflow through the Safety Injection (SI) pump discharge headers. These valves cannot be full-stroke or partial-stroke exercised open during power operation utilizing flow because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. The charging pumps cannot be used during power operation because the flow path from the pumps would bypass the Regenerative Heat Exchanger and result in injecting cold water, causing thermal shock to the injection nozzles and a reactivity transient. This could result in an unnecessary plant trip. Check valve SI-343 cannot be partial-stroke exercised during Cold Shutdowns because using the HPSI pumps without an adequate vent path could cause an overpressurization of the RCS. The HPSI pumps are therefore tagged out to prevent inadvertent operation and potential overpressurization to the RCS.

- Alternate Testing:

  Check valves SI-196, SI-199, SI-202, and SI-205 will be partial-stroke exercised open during Cold Shutdown using the Charging Pumps and full-stroke exercised Open during Refueling Outages when the HPSI pumps are able to be utilized.

  Check valve CH-469 will be partial-stroke exercised open during Cold Shutdown using the charging pumps. Both check valves, CH-469 and SI-343, will be full-stroke exercised open during Refueling Outages using the charging pumps and the HPSI pumps, as necessary.

12. Frequency Justification Number J12 - Refueling Outage Justification

- Components:

  CH-198, CH-203, CH-204

- Function:

  Charging Pump discharge to RCS Check Valve (CH-198)
  Loop Charging Line to RCS Check Valves (CH-203, CH-204)

- Class:

  2 (CH-198)
  1 (CH-203, CH-204)

- Test Requirements:

  Quarterly Full-Stroke Exercising CH-198 in the Open and Closed Directions
  Quarterly full-stroke exercising CH-203 and CH-204 in the Open Direction

- Basis for Justification:

  These check valves cannot be full-stroke exercised open (or closed for CH-198) during plant operations Quarterly or during Cold Shutdowns, since to do so would require the charging and HPSI pumps to be run which would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  The check valves CH-198, CH-203, and CH-204 will be partial-stroke exercised in the open direction Quarterly during power operation using the charging pumps. The check valves will be full-stroke exercised in the open direction during Refueling Outages when the Reactor Pressure Vessel (RPV) head is removed, using the charging pumps and the HPSI pumps. Check valve CH-198 will be full-stroke exercised in the close direction during Refueling Outages.

13. **Frequency Justification Number J13 - Cold Shutdown Justification**

- Component:

  TCV-202, HCV-204

- Function:

  Letdown Temperature Control Valve, Letdown Isolation Valve

- Class:

  1 - (TCV-202)
  2 - (TCV-204)

- Test Requirements:

  Quarterly Stroke-Timing Closed

- Basis for Justification:

  These valves are used for RCS Loop 2A letdown isolation and temperature regulation. Stroking these valves Quarterly during power operation could result in the termination of letdown flow. This would isolate the RCS purification process and could potentially cause a reactivity excursion. These valves cannot be partial-stroked because the valves are either fully open or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown in accordance with the FCS ISI Program Plan implementing procedures.

14. **Frequency Justification Number J14 - Cold Shutdown Justification**

- Component:

  CH-205

- Function:

  Auxiliary Pressurizer Spray Check Valve

- Class:

  1

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Justification:

  This check valve cannot be full-stroke exercised during plant operations Quarterly or during Cold Shutdowns, since to do so would require a flow path to the RCS. That flow path cannot be utilized during power operation because the HPSI pumps do not develop sufficient discharge pressure to overcome RCS pressure. This same flow path cannot be utilized during Cold Shutdowns because there is insufficient volume in the RCS to accommodate the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  The check valves will be partial-stroke exercised in the open direction Quarterly during power operation using the charging pumps. The check valves will be full-stroke exercised in the open direction during Refueling Outages when the RVP head is removed, using the charging pumps and the HPSI pumps.

15. **Frequency Justification Number J15 - Refueling Outage Justification**

- Component:

  HCV-206, HCV-241

- Function:

  RC Pump Control Bleedoff Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Closed

- Basis for Justification:

  The Reactor Coolant Pump (RCP) seals serve as an RCS pressure boundary, therefore, seal failure could result in unisolable coolant leakage from the RCS. Isolation of the RCP seal bleed-off by stroking these valves closed would cause the seal bleed-off line relief valve (CH-208) to lift, directing reactor coolant directly to the Reactor Coolant Drain Tank (RCDT). If the leakage remained unchecked, the RCDT relief valve could lift directing reactor coolant to the Containment floor, causing a Ventilation Isolation Actuation Signal (VIAS). Additionally, the temporary isolation of pump seal flow (until the relief valve lifted) would eliminate the ability of the RCP seal to break down RCS pressure and could potentially cause localized overheating of the seals. The pump seals can be damaged by overheating if seal water flow is stopped while the pumps are running. It is impractical to exercise these valves Quarterly or during any plant conditions that could result in abnormal seal wear. This could lead to failure of the RCP seals, creating unisolable leakage equivalent to a small break LOCA.

- Alternate Testing:

  The valves will be stroke-timed in the closed direction during Cold Shutdown, when the RCS is depressurized and the RCPs are secured.

16. **Frequency Justification Number J16 - Cold Shutdown Justification**

- Components:

  LCV-218-2, LCV-218-3

- Function:

  Volume Control Tank Outlet Isolation Valve and Charging Pump Suction From Safety Injection and Refueling Water Tank (SIRWT) Isolation Valve

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing Closed for LCV-218-2 and
  Quarterly Stroke-Timing Open for LCV-218-3

- Basis for Justification:

  These valves function to provide Volume Control Tank (VCT) level control and switch charging suction to the Safety Injection and Refueling Water Storage Tank (SIRWT). The valves cannot be stroke-tested Quarterly because doing so would terminate charging flow to the RCS and would have the potential for disrupting pressurizer level regulation or boron concentration regulation. Pressurizer level regulation disruption can lead to RCS pressure transients and disruption of boron concentration could cause reactivity excursions.

- Alternate Testing:

  Valve LCV-218-2 will be stroke-timed in the closed direction and valve LCV-218-3 will be stroke-timed in the open direction during Cold Shutdowns.

17. **Frequency Justification Number J17 - Cold Shutdown Justification**

- Components:

  IA-HCV-240-C, HCV-240. HCV-249

- Function:

  Instrument Air (IA) Accumulator Check Valve for HCV-240, Auxiliary Pressurizer Spray Isolation Valves

- Class:

  3 (IA-HCV-240-C), Class 1 (HCV-249, HCV-240)

- Test Requirements:

  Quarterly Exercising in the Open and Closed Directions for IA-HCV-240-C,
  Quarterly Exercising Open for HCV-249 and
  Stroke-Testing in the Open and Closed Directions for HCV-240

- Basis for Justification:

  Valves HCV-240 and HCV-249 cannot be stroke-timed Quarterly during power operation because doing so will lead to large scale depressurization of the RCS and thermal shock of the pressurizer spray nozzle. The IA accumulator check valve (IA-HCV-240-C) cannot be full-stroke exercised in the open direction Quarterly during power operation, as exercising of the check valve will cause HCV-240 to cycle. This could cause large scale depressurization of the RCS and thermal shock of the pressurizer spray nozzle. The check valve (IA-HCV-240-C) cannot be partial-stroke exercised for the same reason.

- Alternate Testing:

  Valve IA-HCV-240-C will be exercised in the open and closed directions during Cold Shutdowns. Valves HCV-240 and HCV-249 will be stroke-timed in both the open and closed directions during Cold Shutdowns.

18. Frequency Justification Number J18 - Cold Shutdown Justification

- Components:

  HCV-268

- Function:

  Concentrated Boric Acid to Charging Pump Suction Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Open Direction

- Basis for Justification:

  These valves serve to isolate concentrated boric acid from the charging pump suction header. These valves cannot be stroke-timed Quarterly during power operation because doing so would allow concentrated boric acid solution to be injected into the RCS. Boration of the primary system during normal power operation would cause reactivity transients and possibly result in a plant shutdown. These valves cannot be partial-stroked for the same reason.

- Alternate Testing:

  Valves will be stroke-timed in the open direction during Cold Shutdown.

19. Frequency Justification Number J19 - Cold Shutdown Justification

- DELETED

20. **Frequency Justification Number J20 - Refueling Outage Justification**

- Component:

  SI-323

- Function:

  High Pressure Safety Injection Header Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open and Closed Directions

- Basis for Justification:

  This check valve functions to prevent backflow of charging flow to the lower design pressure HPSI piping when the alternate charging flow path is active. The only flow path available is into the RCS and since the HPSI pumps do not develop sufficient discharge pressure to overcome RCS operating pressure, this valve cannot be exercised Quarterly during power operation. This valve cannot be exercised during Cold Shutdowns because the RCS does not contain an adequate expansion volume and a low-temperature overpressurization of the RCS could result. Additionally, this valve cannot be partial-stroke exercised during pump test or miniflow because the minimum flow lines branch off upstream of the check valve and no flow occurs through this valve.

- Alternate Testing:

  This check valve will be exercised full-open and full-closed during Refueling Outages.

21. Frequency Justification Number J21 - Cold Shutdown Justification

- Components:

  HCV-344, HCV-345
  IA-HCV-344-C, IA-HCV-345-C

- Function:

  Containment Spray (CS) Header Isolation Valves
  Instrument Air Accumulator Check Valve

- Class:

  2 HCV-344, HCV-345
  2 IA-HCV-344-C, IA-HCV-345-C

- Test Requirements:

  Quarterly Stroke-Timing in Both the Open and Closed Directions for HCV-344 and the Open Direction Only for HCV-345. Quarterly Exercising to the Closed Direction for IA-HCV-344-C and IA-HCV-345-C.

- Basis for Justification:

  Valves HCV-344 and HCV-345 serve as CS isolation. These valves cannot be stroke-tested Quarterly during power operation since the potential for spraying down the Containment is greatly increased. Spraying down the Containment could cause equipment damage, electrical grounds and unnecessary corrosion (due to electrical shorts) to equipment and equipment malfunctions and unnecessary plant trips. These valves represent the only boundary between the CS and SI pump headers and the CS nozzles when manual valves SI-177 and SI-178 are open. The valves cannot be partial-stroked for the same reason.

  Valves IA-HCV-344-C and IA-HCV-345-C are the IA accumulator check valves for process valves HCV-344 and HCV-345, and function to allow the valves to be closed on loss of IA, if required. These check valves cannot be exercised Quarterly as required as this would stroke the process valves, HCV-344 and/or HCV-345.

- Alternate Testing:

  Valve HCV-344 shall be stroke-timed in both the open and closed directions during Cold Shutdown. HCV-345 shall be stroke-timed in the open direction during Cold Shutdown. The IA check valves IA-HCV-344-C and IA-HCV-345-C shall be exercised in the closed direction during Cold Shutdown.

22. **Frequency Justification Number J22 - Cold Shutdown Justification**

- Components:

  HCV-347, HCV-348

- Function:

  Shutdown Cooling from Loop Isolation Valves

- Class:

  1

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves cannot be Quarterly stroke-timed closed during power operation because they are interlocked closed to ensure the integrity of the pressure boundary between Class 2501 and Class 301 piping when the RCS pressure is > 250 psia.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown prior to initiating Shutdown Cooling (<300°F and <250 psi) while the Steam Generator is still available for removing decay heat from the primary system.

23. **Frequency Justification Number J23 - Cold Shutdown Justification**

- Components:

  HCV-425A, HCV-425B, HCV-425C, HCV-425D

- Function:

  Inlet and Outlet Isolation Valves to SI Tank Leakage Coolers

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate Containment Penetrations M-39 and M-53, Component Cooling Water (CCW) System penetrations. They cannot be Quarterly stroke-timed closed during power operation because failure of these valves in the closed position would terminate cooling flow to Safety Injection Tank leakage coolers. This would have the potential for lifting the relief valve (SI-222) to the Reactor Coolant Drain Tank (RCDT) which could eventually cause reactor coolant to overflow to the Containment floor, causing a Ventilation Isolation Actuation Signal (VIAS). These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdowns.

24. Frequency Justification Number J24 - Refueling Outage Justification

- Components:

  HCV-438A, HCV-438B, HCV-438C, HCV-438D, IA-HCV-438B-C, IA-HCV-438D-C

- Function:

  RCP Cooler Isolation Valves, Instrument Air Supply Check Valves

- Class:

  2 (HCV-438A, HCV-438B, HCV-438C, HCV-438D)
  3 (IA-HCV-438B-C, IA-HCV-438D-C)

- Test Requirements:

  HCV-438A, HCV-438B, HCV-438C and HCV-438D are Required to be Stroke-Timed Both in the Open and Closed Directions Quarterly. IA Accumulator Check Valves (IA-HCV-438B-C and IA-HCV-438D-C) are Required to be Exercised Quarterly in the Open and Closed Directions.

- Basis for Justification:

  These valves serve to isolate Containment Penetrations M-18 and M-19, RCP seal cooling water. Exercising these valves would isolate cooling water flow to the RC Pumps which could damage the pumps if they are operating. RC pump failure during power operation could result in a plant shutdown. Therefore, it is not practical to exercise these valves Quarterly during power operations. During some Cold Shutdowns, Reactor Coolant temperature may be held above 130°F and plant conditions may not allow further cooldown or stopping all RC pumps. Exercising these valves during Cold Shutdowns when RC temperature is greater than 130°F or when any RC pump is running could result in RC pump damage. Therefore, it is not practical to exercise these valves when those plant conditions exist. These valves cannot be partial-stroked because they are either fully opened or fully closed.

  The IA accumulator check valves cannot be exercised Quarterly during power operation as exercising these check valves will cause cycling of the process valves.

24. **Frequency Justification Number J24 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  Valves HCV-438A, HCV-438B, HCV-438C and HCV-438D will be stroke-timed in both the open and closed directions during Cold Shutdown, provided the RCS is depressurized, RCS temperature is less than 130°F, and the RCPs are secured. IA accumulator check valves (IA-HCV-438B-C, IA-HCV-438D-C) will be exercised closed during Cold Shutdown, provided the RCS is depressurized, RCS temperature is less than 130°F and the RCPs are secured.

25. **Frequency Justification Number J25 - Cold Shutdown Justification**

- DELETED

26. Frequency Justification Number J26 - Cold Shutdown Justification

- Components:

  HCV-1041A, HCV-1042A

- Function:

  Main Steam Isolation Stop Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate the Main Steam (MS) headers. They cannot be tested Quarterly during power operation because doing so would isolate steam flow in the Steam Generators and result in a turbine and reactor trip. These valves cannot be partial-stroked because they are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

27. **Frequency Justification Number J27 - Cold Shutdown Justification**

- Components:

  HCV-1041C, HCV-1042C

- Function:

  Main Steam Isolation Bypass Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to provide a pathway from the Steam Generators to the steam dump and bypass valves in the event that the Main Steam Isolation Valves (MSIV) close. Stroke-timing these valves Quarterly during power operation is not acceptable because the valves are interlocked closed when the MSIVs are open. Bypassing this interlock could cause the MSIVs to close, causing the turbine to trip and resulting in a reactor trip. The valves cannot be partial-stroked for the same reason.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

28. **Frequency Justification Number J28 - Cold Shutdown Justification**

- Components:

  HCV-1385, HCV-1386
  HCV-1103, HCV-1104, HCV-1105, HCV-1106 |

- Function:

  Main Feedwater Isolation Valves

- Class:

  2
  N |

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  Valves HCV-1385, HCV-1386, HCV-1103, HCV-1104, HCV-1105 and HCV-1106 cannot be stroke-timed Quarterly during power 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. |

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

29. **Frequency Justification Number J29 - Cold Shutdown Justification**

- DELETED

30. **Frequency Justification Number J30 - Refueling Outage Justification**

- Components:

  PCV-1849A, PCV-1849B

- Function:

  Instrument Air Containment Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate IA pressure (via Penetration M-73) to containment systems. PCV-1849A (inboard) and PCV-1849B (outboard) were added during the refueling and maintenance outage (Fuel Cycle 12) in 1988 by Modification MR-FC-88-11 (OSAR 87-10). Stroke-timing cannot be performed Quarterly during power operations or Cold Shutdown with RCS temperature greater than 130°F and the RCS is not depressurized. The valves cannot be partial-stroked, because they are either fully opened or fully closed.

  The closing of these valves could:

  (1) cause fluctuations in the pressure control of the pressurizer (PCV-103-1, PCV-103-2),

  (2) result in damage to RCP seals (HCV-241),

  (3) disrupt RCS letdown to the Chemical Volume Control System (CVCS) (TCV-202, LCV-101-1, LCV-101-2),

  (4) damage the Nuclear Detector instrumentation (HCV-467A/C),

  (5) cause level fluctuation in the SI Tank level (HCV-2916, HCV-2936, HCV-2956, HCV-2976), and

  (6) cause loss of the Steam Generator Blowdown (HCV-1387A and HCV-1388A).

  The ripple effect caused by the exercise stroking of PCV-1849A/B would be detrimental during power operation or when in Cold Shutdown with RCS temperature greater than 130°F and not depressurized.

30. **Frequency Justification Number J30 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown when the RCS temperature is less than 130°F with RCPs off and the RCS depressurized.

31. **Frequency Justification Number J31 - Cold Shutdown Justification**

- Components:

  HCV-2506A, HCV-2506B, HCV-2507A, HCV-2507B

- Function:

  Steam Generator Blowdown Sample Isolation Valves

- Class:

  2

- Test Requirements:

  Quarterly Stroke-Timing in the Closed Direction

- Basis for Justification:

  These valves serve to isolate Steam Generator Blowdown sampling lines. These valves cannot be Quarterly stroke-timed during power 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)e requires that blowdown activity shall be continuously monitored by the Steam Generator Blowdown Sample Monitoring System when blowdown is occurring. Steam generator blowdown is a continuous function at FCS. Partial-stroking cannot be performed since these valves are either fully opened or fully closed.

- Alternate Testing:

  These valves will be stroke-timed in the closed direction during Cold Shutdown.

32. Frequency Justification Number J32 - Cold Shutdown Justification

- DELETED

33. **Frequency Justification Number J33 - Cold Shutdown Justification**

- Components:

  IA-HCV-238-C, IA-HCV-239-C

- Function:

  Instrument Air Supply Check Valves

- Class:

  3

- Test Requirements:

  Quarterly Full-Stroke Exercising in Both the Open and Closed Directions

- Basis for Justification:

  These valves are check valves on IA accumulators attached to HCV-238 and HCV-239, which are located inside the Containment. The process valves (HCV-238 and HCV-239) are remotely stroke-tested in both the open and closed directions Quarterly, but due to inaccessibility during power operation, the check valves are not able to be tested.

- Alternate Testing:

  These check valves will be full-stroke exercised in the open and closed directions at Cold Shutdown. |

34. Frequency Justification Number J34 - Cold Shutdown Justification

- Components:

  IA-HCV-385-C, IA-HCV-386-C
  HCV-385, HCV-386

- Function:

  Instrument Air Supply Check Valves
  SIRWT Minimum Recirculation Isolation Valves

- Class:

  3 (IA-HCV-385-C, IA-HCV-386-C)
  2 (HCV-385, HCV-386)

- Test Requirements:

  Quarterly Full-Stroke Exercising in Both the Open and the Closed Directions.

  Quarterly Stroke Timing in Both the Open and the Closed Directions.

- Basis for Justification:

  These valves (IA-HCV-385-C and IA-HCV-386-C) are check valves on IA accumulators attached to HCV-385 and HCV-386 (Safety Injection Mini Flow Bypass Isolation Valves). The test methodology for the IA accumulator check valves requires the process valves to be closed greater than one hour each. This isolates the SI miniflow recirculation line, which, if the SI pumps start, could cause these pumps to operate at shutoff head. Therefore, the check valves are not able to be tested Quarterly. Running the SI pumps at shutoff head could cause the pumps to overheat and cavitate. Prolonged closure of these valves could cause equipment damage.

  These valves (HCV-385 and HCV-386) are Safety Injection Minimum Recirculation Flow isolation valves to the SIRWT (SI-5). The test methodology for these valves requires these valves to be stroke tested closed which isolates the SI pump minimum recirculation flow path. During the time where one or both minimum-recirculation isolation valves are closed and a real or inadvertent start of a Safety Injection Pump occurs the pump would be deadheaded. This could cause damage to the SI pump and potentially degrade the margin of safety inherent to the SI system. Although the probability that a small Break LOCA would occur at the same time is very remote. Fort Calhoun Station has decided to stroke time HCV-385 and HCV-386 during Cold Shutdown. It is also important to know that during normal operations valves HCV-385 and HCV-386 are Normally Open, Fail Open, and are only required to close during a Recirculation Actuation Signal (RAS).

34. **Frequency Justification Number J34 - Cold Shutdown Justification (Continued)**

Fort Calhoun Station is confident that performing the stroke testing of HCV-385 and HCV-386 during Cold Shutdown, in accordance with the ISI Program Plan, will provide an acceptable alternative test frequency and will provide a reasonable assurance of the ability of the valves to function as required during a design accident condition.

- Alternate Testing:

  These valves (IA-HCV-385-C and IA-HCV-386-C) will be full-stroke exercised in the open and closed directions at Cold Shutdown.

  Valves HCV-385 and HCV-386 will be stroke-timed in both the open and closed directions at Cold Shutdown.

35. Frequency Justification Number J35 - Cold Shutdown Justification

- Component:

  CH-166

- Function:

  Volume Control Tank Outlet Check Valve

- Class:

  2

- Test Requirements:

  Quarterly Full-Stroke Exercising in the Closed Direction

- Basis for Justification:

  This check valve serves to prevent a divergent path from the Boric Acid Injection system to the VCT. A divergent path may reduce the concentration of boric acid required to be injected into the RCS.

  This check valve cannot be full-stroke exercised in the closed direction Quarterly during power operation. The only flow path through this valve is to the RCS, and would result in injecting highly concentrated boric acid into the RCS. Injecting concentrated boric acid into the RCS during power operation could cause an uncontrolled reactivity excursion, a plant shutdown, or a plant trip.

- Alternate Testing:

  Valve will be full-stroke exercised in the closed direction during Cold Shutdown frequency in accordance with the FCS ISI Program Plan.

36. Frequency Justification Number J36 - Refueling Outage Justification

- Components:

  SI-135, SI-143, SI-149

- Function:

  Containment Spray Pump Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in both the Open and Closed Directions

- Basis for Justification:

  These valves cannot be full-stroke exercised open or close Quarterly during power operation because the only full flow path is into the CS headers. This would result in the spraying down of the equipment in containment, possibly causing equipment damage and requiring extensive cleanup. Also, these valves cannot be partial-stroke exercised during the Quarterly CS pump tests because the minimum flow lines branch off upstream of the check valves and therefore no flow occurs through these valves. Using the discharge tap downstream of the minimum flowlines will overflow the floor drains in the Auxiliary Building potentially creating an increase in radioactive contamination and background radiation levels.

- Alternate Testing:

  Valves will be full-stroke exercised in the open and closed directions during Cold Shutdown when the CS pumps are able to be aligned for shutdown cooling to the Shutdown Cooling Heat Exchangers (< 120°F primary temperature), in accordance with the FCS Technical Specifications.

37. Frequency Justification Number J37 - Cold Shutdown Justification

- DELETED

38. Frequency Justification Number J38 - Cold Shutdown Justification

- Components:

  IA-PCV-6680A-1-C, IA-PCV-6680A-2-C, IA-PCV-6680B-1-C,
  IA-PCV-6680B-2-C, and IA-PCV-6682-C
  IA-HCV-1107A-C, IA-HCV-1107B-C, IA-HCV-1108A-C
  IA-HCV-1108B-C, IA-FCV-1368-C, and IA-FCV-1369-C

- Function:

  These check valves are Instrument Air supply header check valves for dampers PCV-6680A-1, PCV-6680A-2, PCV-6680B-1, PCV-6680B-2, and PCV-6682 (Control Room HVAC dampers).

  These check valves are Instrument Air (IA) supply header check valves for Auxiliary Feedwater (AFW) isolation valves HCV-1107A/B and HCV-1108A/B and for the AFW pumps FW-6 and FW-10 recirculation isolation valves.

- Class:

  3

- Test Requirements:

  Quarterly Full Flow Exercising in the Closed Direction

- Basis for Justification:

  These valves (IA-PCV-6680A-1-C/-2-C, -6680B-1-C/-2-C and IA-PCV-6682-C) cannot be exercised Quarterly during power operation, as exercising these check valves will cause isolation of the Control Room (CR) air filtration dampers. Failure of the CR air filtration dampers in a non-conservative position would cause the CR filtration system to be inoperable. This would require the plant to be in Cold Shutdown per Technical Specification (TS) 2.12. Failure of the dampers in the OPEN position would not allow the CR to be isolated during a toxic gas release. This would result in entry into Technical Specification 2.0.1.

  Check valves IA-HCV-1107A/B-C, -1108A/B-C, and FCV-1368-C/1369-C cannot be exercised Quarterly during power operation as exercising these check valves will cause possible isolation of AFW and render the AFW system inoperable for an extended period of time, possibly requiring the plant to be in Cold Shutdown per Technical Specification 2.5. Failure of the isolation valves in the open direction would not allow the required flow rate to the Steam Generator assuming loss of FW-10. This would result in entry into Technical Specification 2.0.1, i.e., Notification of Unusual Event (NOUE).

38. **Frequency Justification Number J38 - Cold Shutdown Justification (Continued)**

- Alternate Testing:

  Check valves IA-PCV-6680A-1-C, IA-PCV-6680A-2-C, IA-PCV-6680B-1-C, IA-PCV-6680B-2-C, and IA-PCV-6682-C will be full-stroke exercised in the closed direction during Cold Shutdown. Check valves IA-HCV-1107A-C, IA-HCV-1107B-C, IA-HCV-1108A-C, IA-HCV-1108B-C, IA-FCV-1368-C, and IA-FCV-1369-C will be full-stroke exercised in both the open and closed directions during cold shutdown.

39. **Frequency Justification Number J39 - Refueling Outage Justification**

- Components:

  HCV-1041B, HCV-1042B

- Function:

  Main Steam Stop Check (Reverse Flow) Valve

- Class:

  2

- Test Requirements:

  Quarterly Reverse Full Flow Test Exercise

- Basis for Exception from O&M Part 10, Subsection 4.3.2.4:

  These check valves are swing type check valves which are installed to provide a positive isolation of the Steam Generators. If Main Steam (MS) header pressure is greater than Steam Generator pressure, the check valves prevent reverse back flow into a faulted Steam Generator. The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 28 inch carbon steel Ametek, Inc. type check valves which see flow during normal operations. OPPD has previously disassembled and inspected each of these check valves once and the check valves were acceptable. "Like new" is defined as a condition of the component that has visible indication of wear, but the valve is able to function as required. In order to assess the condition of the check valves during sample disassembly and inspection and to provide a consistent and precise method of gauging the check valves physical and mechanical condition, a check list was developed and incorporated into the surveillance tests used for sample disassembly and inspection. An example of items evaluated on the check list are:

  1) Whether valve discs are initially seated
  2) A determination of obstructions
  3) Cracking or linear indications
  4) Loose/missing/broken parts
  5) Whether obstruction to moving parts
  6) Wear/Corrosion/Erosion
  7) Presence of foreign material
  8) Misalignment (if any) and effect on valve operation
  9) Mechanical damage
  10) Hinge Pin condition
  11) Disc/seat condition
  12) Perform manual exercise of discs.

  Each check valve has been disassembled and inspected in the previous outages. The assessment of the valves' mechanical and

39. **Frequency Justification Number J39 - Refueling Outage Justification (Continued)**

physical condition is performed by FCS Inspectors qualified to VT-3 in accordance with ASME Section XI. In addition, the review/evaluation of any observed deficiencies/indications is performed by Engineering for a final acceptance of the valves condition. In addition a review of the installation of each check valve has been addressed using the "EPRI Applications Guideline for Check Valves in Nuclear Power Plants" and appropriate actions have been taken (i.e., Preventive Maintenance (PM) inspections) as a result of the completion of the design application for the check valves. Disassembly and reassembly of both valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability. These check valves cannot be exercised Quarterly during power operation because doing so would cause steam to be isolated to the Main Steam header, causing the turbine to trip and resulting in a reactor trip. It is impractical to reverse flow test these check valves during Cold Shutdown; to do so would require the downstream side of the valves to have reverse flow sufficient to close the ~600 pound, 28-inch disks. To close these disks would require extensive modifications to the secondary side of the Main Steam system to permit sufficient ΔP to close the valve disks. Another method would be to fill the downstream side of the valve disks with fluid. To do this would require extensive piping and support modifications because of excessive loading on the Main Steam piping. To perform any type of successful reverse flow test on these check valves would require extensive plant modifications and manpower, and would subject the Main Steam system to potentially detrimental conditions, without providing a commensurate increase in public safety or check valve reliability.

- Alternate Testing:

  Check Valves HCV-1041B and HCV-1042B will be alternately disassembled and inspected one each Refueling Outage. Sample disassembly of these check valves is in accordance with O&M Part 10 and the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2. For an 18-month refueling cycle, this method of sample disassembly and inspection ensures that each check valve is disassembled and inspected at least once every three years.

40. Frequency Justification Number J40 - Cold Shutdown Justification

- Components:

  LCV-383-1, LCV-383-2, HCV-383-3, HCV-383-4
  IA-LCV-383-1-C, IA-LCV-383-2-C

- Functions:

  LCV-383-1, LCV-383-2; SIRWT Isolation Valves
  HCV-383-3, HCV-383-4: Containment Sump Isolation Valves
  LCV-383-1-C, LCV-383-2-C; Instrument Air Supply Check Valves

- Class:

  2 (LCV-383-1, LCV-383-2, HCV-383-3, HCV-383-4)
  3 (IA-LCV-383-1-C, IA-LCV-383-2-C)

- Test Requirements:

  LCV-383-1, LCV-383-2; Quarterly stroke timing in both the Open and the Closed directions

  HCV-383-3, HCV-383-4; Quarterly stroke timing in the Open directions

  LCV-383-1-C, LCV-383-2-C: Quarterly full-flow exercising in both the Open and Closed directions

- Basis for Justification:

  Tech Spec Implications

  OP-ST-SI-3001, Attachment 5, prior to PC 42612 contained a caution stating that "Closing LCV-383-1 renders LPSI Pump SI-1B, HPSI Pump SI-2B, and CS pumps SI-3C and 3B INOPERABLE." The applicable Limiting Conditions for Operation (LCO) action statements of Technical Specifications 2.1.1, 2.3, 2.4 and 2.7 must be implemented.

  Technical Specification 2.3(2) specifically states that during power operation, the Minimum Requirements may be modified to allow **one** of the following conditions to be true at any one time. If the system is not restored to meet the minimum....

  ...a. One low-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.

  ...b. One high-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.

40. **Frequency Justification Number J40 - Cold Shutdown Justification (Continued)**

By performing this test at power, two provisions of Tech Spec 2.3(2) are violated concurrently, requiring entry into Technical Specification 2.0.1.

Safeguards Implications

Operations reviewed the possibility of utilizing a dedicated operator during performance of this surveillance test. Using the guidance of the NRC Generic Letter 91-18, Operations Memo 93-11, and Standing Order G-100 (approved and issued), the following conclusions can be drawn. The Generic Letter information is explicit in stating that, generally, equipment is inoperable during surveillance. The use of a dedicated operator must be reviewed to ensure that the operator and his necessary actions would result in a configuration where the system did not need to be considered inoperable. In the case of LCV-383-1 and -2, this determination cannot be made. Even if a dedicated operator were stationed at the valve and were to immediately return the valve to an open condition in the event of an accident signal, the open travel time of the valves is roughly 30 seconds. The sequencer timer for a HPSI pump is approximately 3 seconds, with LPSI pumps following shortly in less than 15 seconds. Adding in reaction time of the operator, even a few seconds, there is a high probability that more than one SI pump would start without a suction source. Practically speaking, the most prudent action to prevent equipment damage would be to place the respective pumps in pull-out. This, however, renders the pumps inoperable and the Tech Specs noted above apply. Thus, no positive operability determination can be made; instead, Tech Spec 2.0.1 again applies.

Testing of HCV-383-3 and -383-4 is performed in conjunction with the testing of LCV-383-1 and -383-2 (during the time frame when these valves are closed) because of the possibility that the check valves in the recirculation lines may not hold. If the check valve did not hold, and LCV-383-1 or -2 was left open, cycling HCV-383-3 or -4 to the open position could result in backing the SIRWT up into the containment sump. Among possible consequences of this, violating the Technical Specification on SIRWT level is one possibility. Consequently, it is preferable to close LCV-383-1/2 during cycling of HCV-383-3 or -4. Closing LCV-383-1/2 during power operation results in entry to Tech Spec LCO 2.0.1 (see discussion for LCV-383-1/2, above).

40. **Frequency Justification Number J40 - Cold Shutdown Justification (Continued)**

Testing of LCV-383-1-C and -383-2-C is performed to demonstrate the ability of the instrument air check valve to isolate instrument air and continue to hold the valve closed with backup nitrogen. The purpose of the test is to demonstrate the ability of nitrogen to hold the valve closed, and thus must be performed with LCV-383-1/2 in the closed condition. The closure of LCV-383-1/2 during power operation results in entry to Tech Spec 2.0.1 (see discussion for LCV-383-1/2, above). Therefore, testing of these check valves must be deferred to a Cold Shutdown/Refueling condition.

- Alternate Testing

Valves (LCV-383-1, LCV-383-2) shall be stroke-timed in both the open and closed directions at cold shutdown frequency.

Valves (HCV-383-3, HCV-383-4) shall be stroke-timed in the open direction at Cold Shutdown frequency.

Valves (LCV-383-1-C, LCV-383-2-C) shall be exercised in the open and closed directions at Cold Shutdown frequency.

41. Frequency Justification Number J41 - Refueling Outage Justification

- Components:

  HCV-482A, HCV-482B, HCV-483A, HCV-483B, HCV-2808C, HCV-2808D, HCV-2809C, HCV-2809D, HCV-2898C, HCV-2898D, HCV-2899C, HCV-2899D

- Functions:

HCV-482A, HCV-482B:	Shutdown Cooling (SDC) Heat Exchanger (HX), AC-4A, Backup Raw Water Inlet and Outlet Valves.
HCV-483A, HCV-483B:	Shutdown Cooling Heat Exchanger, AC-4B, Backup Raw Water Inlet and Outlet Valves.
HCV-2808C, HCV-2808D:	Low Pressure Safety Injection (LPSI) Pump SI-1A Bearing Cooling Backup Raw Water Inlet and Outlet Valves.
HCV-2809C, HCV-2809D:	Low Pressure Safety Injection (LPSI) Pump SI-1B Bearing Cooler Backup Raw Water Inlet and Outlet Valves.
HCV-2898C, HCV-2898D:	Control Room VA Unit VA-46A Backup Raw Water Inlet and Outlet Valves.
HCV-2899C, HCV-2899D:	Control Room VA Unit VA-46B Backup Raw Water Inlet and Outlet Valves.

- Class:

  3

- Test Requirements:

  Quarterly exercising in the Open and Closed directions.

- Basis for Justification:

  The subject valves are locally operated by air and provide backup Raw Water (RW) for cooling plant loads such as Control Room HVAC, LPSI Bearing Coolers, SDC HX normally cooled by Component Cooling Water (CCW) in the event of a loss of CCW for an extended period of time. The valves cannot be exercised quarterly or during Cold Shutdown because the performance of this test requires a complete RW outage and securing CCW so as to not allow nitrates to contaminate the river water, (which is an environmental concern), nor to contaminate the CCW system with sand from the RW system. The RW system must be secured and drained as much as practical and the CCW system pressure must be low so as not to contaminate the RW system. Securing CCW and RW during every Cold Shutdown may not be practical due to the high decay heat experienced during Cold Shutdowns of short duration.

41. **Frequency Justification Number J41 - Refueling Outage Justification (Continued)**

- Alternate Testing:

  These valves will be manually exercised in both the open and closed directions during Refueling Outages.

42. Frequency Justification Number J42 - Cold Shutdown Stroke Test Frequency

DELETED

43. Frequency Justification Number J43 - Cold Shutdown Frequency

- Components:

  NG-142, NG-144, NG-146, NG-148

- Function:

  Nitrogen supply to the Safety Injection (SI) tanks (SI-6A, SI-6B, SI-6C, and SI-6D) check valves.

- Class:

  3

- Testing Requirements:

  Quarterly full-stroke exercising in the Close direction.

- Basis for Justification:

  Check valves NG-142, NG-144, NG-146 and NG-148 function to prevent backflow through the check valves and the nitrogen (N_2) supply to the SI Tanks during an accident condition. The check valves prevent loss of N2 from the SI Tanks during an accident condition. These check valves cannot be full-stroke exercised Quarterly, as the containment would be inaccessible during power operation and the SI Tanks would be required to be made inoperable in order to perform this test. The SI Tanks are required to function in order to provide adequate protection to the plant personnel and the general public during a postulated loss of coolant accident (LOCA). Check valves will be partial-stroke exercised quarterly, during normal plant operations or using a PMO procedure as required in order to ensure that the check valves are partially stroke exercised at least quarterly.

- Alternate Testing:

  Check valves, NG-142, NG-144, NG-146 and NG-148 will be partial-stroke exercised quarterly during power operation in the open and close directions using normal plant operations/logs. The check valves will be full-stroke exercised open and closed during Cold Shutdowns.

APPENDIX 2B

JUSTIFICATION FOR EXCEPTION TO ASME SECTION XI/O&M MANUAL PARTS 1 AND 10, CODES FOR VALVES

JUSTIFICATION FOR EXCEPTION
TO ASME SECTION XI/O&M PARTS 1 AND 10 CODES FOR VALVES

This section provides justification for the exceptions taken to Code test requirements as allowed for in 10CFR50.55a(g)(5)(iii). Each Code exception is identified by a unique number and identifies the valve(s) for which the Code exception is being taken. The specific Code test requirement found to be impractical is defined and the basis for exclusion from Code requirements is presented. Any testing performed in lieu of Code requirements is specified. Two types of justifications are provided. The first is general in nature and pertains to Code requirements found to be impractical for numerous valves. The second type is used to justify Code exceptions for specific valves. Code exceptions for specific valves are numbered (Ex) and referenced by number on the Valve Test Program Matrix Table 2.1 for specific valves.

General: Code Exception Number G1

- Components:

  Category C Thermal Relief Valves

- Function:

  Thermal relief valves on safety-related systems

- Class:

  1, 2, and 3

- Test Requirements:

  O&M Part 1 Subsection 1.1 Scope

- Basis for Exception from O&M Part 1, Subsection 1.1:

  The O&M Code Part 1 provides general requirements for periodic performance testing and monitoring of pressure relief devices utilized in nuclear power plant systems which are required to perform a specific function in shutting down a reactor or in mitigating the consequences of an accident. Thermal relief valves will not be tested in accordance with O&M Part 1 guidance as part of the FCS ISI Program Plan, as FCS has determined that the thermal relief valves do not fully meet the intent of the scope of O&M Part 1. Many safety-related systems, particularly those with heat exchangers, have been provided with relief valves. These relief valves are thermal relief valves of small capacity intended to relieve pressure due to a thermal expansion of fluid in a "bottled-up" condition, which is considered a self-limiting transient. Experience has shown that failure of these valves will not result in a failure of the system to fulfill its safety function. Thus, most thermal relief valves are not considered to perform a function "important to safety", and as such have not been included in the FCS ISI Program Plan.

General: Code Exception Number G1 (Continued)

Further clarification was provided in the NRC SER (Reference 7), for applicability to the Section XI Code. Thermal relief valves installed to protect portions of safety-related systems against overpressure may be included in this expanded scope. The relief valves that may be involved are those that meet the following criteria:

a. The relief valve protects a portion of a safety-related system,

b. The protected piping and/or component may be isolated during a plant operating mode where credit is taken for operation of the safety-related system,

c. The protected section is subjected to a mechanism that could over pressurize the system/component when isolated,

d. The integrity of the protected section is required for the system to meet its safety function, (i.e., stuck open relief valve).

A safety-related valve is defined as an active or passive valve which is required to perform a specific function in shutting down the reactor to cold shutdown condition, in maintaining the Cold Shutdown condition, or in mitigating the consequences of an accident. Relief valves which protect over-pressurization of portions of systems/components that perform a safety related function are included.

Because some thermal relief valves at FCS may be included in the expanded scope discussed above, general relief was not granted as requested for all thermal relief valves. A request was made that the licensee provide further justification for exclusion of relief valves from the Section XI Program based on the criteria mentioned above.

An engineering review was completed for all Critical Quality Element (CQE) (Class 1, 2, and 3) relief valves at Fort Calhoun Station with the provided guidance in addition to the OM-1 Code guidance. The thermal relief valves which have been excluded from the Section XI program were excluded for the following reasons.

Justification:

1. The relief valve protects Class 1, 2, or 3 (Class Code) systems/components that are not required to shutdown the plant/reactor, maintaining the plant/reactor in a shutdown condition or mitigate an accident.

OR

2. The relief valve is installed on safety related systems/components which are not isolated during the operating cycle and are therefore not subjected to a mechanism that could cause over pressure. In addition, the integrity of the protected section (i.e., stuck open relief valve) is not required for the system to meet its safety function, nor will loss of integrity render the system inoperable.

OR

3. The relief valve is installed on safety related systems/components, which are not subjected to any overpressure mechanism due to system design.

Justification for Exclusion from the FCS ISI Program Plan:

AC-166, AC-167, AC-168, AC-169, AC-291, AC-292, AC-293, and AC-294

RCP RC-3A/B/C&D Seal Cooler CCW Inlet Relief Valves
RCP RC-3A/B/C&D Lube Oil Cooler CCW Inlet Relief Valves

Justification: 1

The Reactor Coolant Pumps (RCPs) are not required for safe shutdown of the plant. The USAR assumes that only natural circulation is available for the RCS to cool down. Hence, the portion of the CCW system protected by these relief valves is not required. Although this portion of the CCW system is isolable, this portion of the CCW system is never isolated with the RCPs in operation.

AC-170 and AC-183

Sample Heat Exchanger SL-8A and SL-8B CCW Inlet Relief Valve (Secondary)
Sample Heat Exchanger SL-3 CCW Inlet Relief Valve (Primary)

Justification: 1 & 2

These sample heat exchangers are not required for safe shutdown of the plant nor do they protect equipment which mitigate an accident. The inlet and outlet isolation valves are administratively controlled open during the operating cycle.

AC-173 and AC-178

Waste Gas Compressor WD-28A & B Seal Water Heat Exchanger CCW Inlet Relief Valves

Justification: 1 & 2

The Waste Gas Compressors are not required for safe shutdown of the plant nor do they protect equipment which mitigate an accident. The inlet and outlet isolation valves are administratively controlled open during the operating cycle.

AC-258

Letdown Heat Exchanger CH-7 CCW Inlet Relief Valve

Justification: 1 & 2

The Letdown Heat Exchanger is not required for safe shutdown of the plant nor is it utilized in mitigation of an accident. In addition, the portion of the system remains in service during the operating cycle and therefore is not subjected to an overpressurization mechanism.

AC-336, AC-337, and AC-338

Charging Pump CH-1A, B, & C Oil Cooler CCW Inlet Relief Valves

Justification: 2

This portion of the CCW system remains inservice during the operating cycle. Hence this section of the CCW system are administratively controlled open on the inlet and outlet piping of the cooler to the rest of the CCW system. This section of piping is not subjected to an overpressurization mechanism.

AC-1026, AC-1027 and AC-1059

Shutdown Cooling Heat Exchanger AC-4A & B CCW Relief Valves
Spent Fuel Pool Heat Exchanger AC-8 CCW Relief Valve

Justification: 3

Due to the design of the isolation/flow control valves, these components and piping are not subjected to an overpressurization mechanism. The inlet isolation/flow control valves are Fisher Model 7620 series valves. The type 7600 series butterfly valve is a heavy-duty valve suitable for general control applications where

extreme low leakage rates are not required. This valve design is not equipped with a valve seat.

CH-178, CH-179, and CH-180

Charging Pump CH-1A, B & C Suction Relief Valves

Justification: 2

This portion of the CVCS Charging system remains inservice during the operating cycle. If the charging pump is not inservice at the time, then the charging pumps remain unisolated and in the standby condition. These pumps are taken out of service routinely for maintenance due to the nature of positive displacement charging pumps. However, when the charging pump is isolated to be tagged out of service, the tagout requires that the system be drained and vented. Reference Computerized Tagging System for tagout of a charging pump. Hence this section of the CVCS Charging system remains open on the inlet and outlet piping of the charging pumps to the rest of the CVCS system. This section of piping is not subjected to an overpressurization mechanism.

CH-202

Reactor Coolant System Loop Charging System Bypass Valve/Thermal Relief

Justification: 2

CH-202 is the Bypass valve around CH-238. The Charging system loop injection headers into loop 1A and 1B are open during the operating cycle with at least 40 gpm charging flow. This system is not taken out of service. Hence, there is no overpressurization mechanism which requires CH-202 to open. Failure of this spring loaded check valve to the open position would not prevent this system from performing it's design function.

CH-219

Charging Pumps Suction Relief Valve on Common Suction Header from VCT

Justification: 2

This piping is continually in service during the operating cycle. There is no overpressurization mechanism which will challenge this relief valve.

CH-159, CH-223, and CH-224

VCT CH-14 Outlet Relief Valve
Regenerative Heat Exchanger CH-6 Letdown Relief Valve
Letdown Heat Exchanger CH-7 Letdown Relief Valve

Justification: 1

The letdown portion of the CVCS system is not required to shutdown the plant, maintain the plant shutdown, or mitigate an accident. Therefore, these thermal relief valves do not meet the requirements of Section XI.

JW-4-1 and JW-4-2

Expansion Tank JW-1-1 and JW-2-1 Pressure Caps

Justification: 3

These caps were not installed until 1988. There is no operational significance for these caps. The jacket water system runs at atmospheric pressure. These caps were installed to prevent the jacket water from burping onto the floor after the diesel generator is shutdown. If these caps would stick in the open or closed position, there would be no effect on the operation/operability of the cooling system. Based on this lack of safety significance and affect these caps have of the jacket water system, there is no applicability to the Section XI Program.

SI-222 and SI-311

Safety Injection Tanks Fill/Drain Line Relief Valve
SIRWT SI-5 Return Line Relief Valve

Justification: 1

These portions of the Safety Injection system are not required to shutdown the plant, maintain the plant shutdown, or mitigate an accident. Therefore, these relief valves do not meet the requirements of Section XI.

SI-278, SI-279, SI-280, and SI-281

Safety Injection Tank (SIT) SI-6A/B/C & D Outlet Relief Valves

Justification: 3

These relief valves have a setpoint of 395 psig and are located on the discharge piping downstream of the Safety Injection Tanks (SIT) outlet isolation valves, (HCV-2914, HCV-2934, HCV-2954 and

HCV-2974). The SIT valves are locked open during the operating cycle. Therefore overpressure protection is provided by the SIT relief valves (SI-209, SI-213, SI-217, and SI-221) which are set at a lower pressure of 275 psig. These relief valves are tested in the Section XI Program. There is no overpressure mechanism that subjects this portion of outlet piping to exceed the design pressure.

- Alternate Testing:

Tests and test frequency for thermal relief valves not included will be controlled under the FCS Preventive Maintenance (PM) Program and be conducted in a similar manner as the FCS ISI Program Plan.

1. **Code Exception Number E1 - Relief Request**

- Components:

  SI-139, SI-140

- Function:

  SIRWT Discharge Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction and Leakage Testing Once Every Two Years

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These check valves function to prevent backflow to the Safety Injection and Refueling Water Tank (SIRWT). These check valves are located in the lines leading from the SIRWT to the suctions of the Containment Spray (CS) pumps, the Low Pressure Safety Injection (LPSI) pumps and the High Pressure Safety Injection (HPSI) Pumps. The check valves under certain accident conditions must open sufficiently to provide design basis flow to all of these pumps. Because of this system design requirement, the full-stroke exercising of these check valves Quarterly or during Cold Shutdowns cannot be performed. During power operation, no full flow path exists for the combination of pumps because the HPSI and LPSI pumps cannot overcome the RCS pressure, and the CS system cannot be permitted to spray down the Containment. No full flow path is available during Cold Shutdowns because operating the HPSI pumps could create a low-temperature overpressurization condition in the RCS. CS cannot be used because the Containment would be sprayed down. Additionally, it is not possible to achieve the maximum design accident flow through the check valves during full flow exercising.

  The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 20 inch stainless steel Mission-Duochek type valves which see very little flow during normal operations. OPPD has previously disassembled and inspected each of these check valves once and these check valves were "like new." "Like new" is defined as a condition of the component that has little or no visible indication of wear, as if the valve was just installed from the factory. In order to assess the condition of the check valves during sample disassembly and inspection and, to provide a consistent and precise method of gauging the check

1. **Code Exception Number E1 - Relief Request (Continued)**

valves physical and mechanical condition, a checklist was developed and incorporated into the Surveillance Tests used for sample disassembly and inspection. An example of items evaluated on the check list are:

1. Whether valve discs are initially seated
2. A determination of obstructions
3. Cracking or linear indications
4. Loose/missing/broken parts
5. Whether obstruction to moving parts
6. Wear/Corrosion/Erosion
7. Presence of foreign material
8. Misalignment (if any) and effect on valve operation
9. Mechanical damage
10. Hinge pin condition
11. Disc/seat condition
12. Perform manual exercise of discs

Each check valve has been disassembled and inspected in previous outages. The assessment of the valves mechanical and physical condition is performed by FCS Inspectors qualified to VT-3 in accordance with ASME Section XI. In addition, the review/evaluation of any observed deficiencies/indications is performed by engineering for a final acceptance of the condition of the valve. In addition, a review of the installation of each check valve has been addressed using the "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants" and appropriate actions have been taken (i.e., PM inspections) as a result of the completion of the design application review for the check valves. The industry has experienced no failures with this type of check valve in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure as well as creating significant (i.e., > 50 gallons) liquid radwaste requiring disposal. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

1. **Code Exception Number E1 - Relief Request (Continued)**

- Alternate Testing:

  OPPD will require check valves SI-139 and SI-140 to be alternately disassembled and inspected every other Refueling Outage. This sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2. In addition, the check valves will be partial-stroke exercised in the open direction Quarterly and after reassembly during Refueling Outages. The check valves will be full-stroke exercised in the closed direction during each Refueling Outage. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that integrity, quality and the ability to detect component degradation are maintained.

2. Code Exception Number E2 - Relief Request

- Components:

  SI-159, SI-160

- Function:

  Containment Recirculation Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These valves function to prevent backflow to the Containment lower level. These valves 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 (RAS). Due to system design, these valves cannot be partial-stroke or full-stroke exercised open during power operation, Cold Shutdown or Refueling Outage because the Containment sump is normally dry and there is no flow path available for testing. Full-stroke exercising these valves open requires that the Containment sump be filled with water and provided with a source of makeup water in addition to operating the CS pumps and the HPSI pumps at rated capacity. Therefore, system configuration renders flow testing of these valves impractical.

  The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 24-inch stainless steel Mission-Duochek type valves which see no flow during normal operations. OPPD has previously disassembled and inspected each of these check valves and these check valves were "like new." "Like new" is defined as a condition of the component that has little or no visible indication of wear, as if the valve was just installed from the factory. In order to assess the condition of the check valves during sample disassembly and inspection and, to provide a consistent and precise method of gauging the check valves physical and mechanical condition, a checklist was developed and incorporated into the Surveillance Tests used for sample disassembly and inspection. An example of items evaluated on the check list are:

  1. Whether valve discs are initially seated

2. **Code Exception Number E2 - Relief Request (Continued)**

2. A determination of obstructions

3. Cracking or linear indications

4. Loose/missing/broken parts

5. Whether obstruction to moving parts

6. Wear/Corrosion/Erosion

7. Presence of foreign material

8. Misalignment (if any) and effect on valve operation

9. Mechanical damage

10. Hinge pin condition

11. Disc/seat condition

12. Perform manual exercise of discs

Each check valve has been disassembled and inspected in previous outages. The assessment of the valves mechanical and physical condition is performed by FCS Inspectors qualified to VT-3 in accordance with ASME Section XI. In addition, the review/evaluation of any observed deficiencies/indications is performed by engineering for a final acceptance of the condition of the valve. In addition, a review of the installation of each check valve has been addressed using the "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants" and appropriate actions have been taken (i.e., PM inspections) as a result of the completion of the design application review for the check valves. The industry has experienced no failures with this type of check valve in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure as well as creating significant (i.e., > 50 gallons) liquid radwaste requiring disposal, with minimal benefits. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

2. **Code Exception Number E2 - Relief Request (Continued)**

- Alternate Testing:

  OPPD will require check valves SI-159 and SI-160 to be alternately disassembled and inspected every other Refueling Outage. This sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2 with the exception of partial-stroke exercising. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that the integrity, quality and the ability to detect component degradation is maintained.

3. **Code Exception Number E3 - Relief Request**

- Components:

  SI-175, SI-176

- Function:

  Containment Spray Header Check Valves

- Class:

  2

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These check valves are located inside Containment. These valves cannot be full-stroke or partial-stroke exercised open using system flow during any plant operating conditions because the only flow path is into the CS headers and would result in spraying down the Containment, causing equipment damage and requiring extensive cleanup.

  The corrective maintenance history of these two check valves has been limited to gasket/bolt/nut replacements since installation. In addition, the check valves are 12-inch stainless steel Mission-Duochek type valves which see no flow during normal operations. OPPD has previously disassembled and inspected each of these check valves and these check valves were "like new." "Like new" is defined as a condition of the component that has little or no visible indication of wear, as if the valve was just installed from the factory. In order to assess the condition of the check valves during sample disassembly and inspection and, to provide a consistent and precise method of gauging the check valves physical and mechanical condition, a checklist was developed and incorporated into the Surveillance Tests used for sample disassembly and inspection. An example of items evaluated on the check list are:

  1. Whether valve discs are initially seated
  2. A determination of obstructions
  3. Cracking or linear indications
  4. Loose/missing/broken parts
  5. Whether obstruction to moving parts
  6. Wear/Corrosion/Erosion

3. **Code Exception Number E3 - Relief Request (Continued)**

7. Presence of foreign material

8. Misalignment (if any) and effect on valve operation

9. Mechanical damage

10. Hinge pin condition

11. Disc/seat condition

12. Perform manual exercise of discs

Each check valve has been disassembled and inspected in previous outages. The assessment of the valves mechanical and physical condition is performed by FCS Inspectors qualified to VT-3 in accordance with ASME Section XI. In addition, the review/evaluation of any observed deficiencies/indications is performed by Engineering for a final acceptance of the condition of the valve. In addition, a review of the installation of each check valve has been addressed using the "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants" and appropriate actions have been taken (i.e., PM inspections) as a result of the completion of the design application review for the check valves. The industry has experienced no failures with this type of check valve in similar applications at other facilities. The disassembly and subsequent inspection of these valves requires unnecessary radiation exposure with minimal benefits. Also, frequent disassembly and reassembly of the valves (i.e., every Refueling Outage) introduces unnecessary potential for valve failure due to damage caused by maintenance without providing a commensurate increase in plant safety or check valve reliability.

Alternate Testing:

Check valves SI-175 and SI-176 will be alternately disassembled every other refueling outage. The sample disassembly of these check valves is in accordance with the NRC guidelines established in Generic Letter 89-04, Attachment 1, Position 2. In addition, the check valves will be partial-stroke exercised in the open direction during Refueling. This method of sample disassembly and inspection will ensure that each check valve is disassembled and inspected at least once every six years and will help to maintain personnel exposure ALARA, while at the same time providing reasonable assurance that the integrity, quality and the ability to detect component degradation is maintained.

4. **Code Exception Number E4 - Relief Request**

- Components:

  SI-207, SI-208, SI-211, SI-212, SI-215, SI-216, SI-219, SI-220

- Function:

  Safety Injection Tank (SIT) Check Valves

- Class:

  1

- Test Requirements:

  Quarterly Full Flow Exercising in the Open Direction
  Quarterly Full Flow Exercising in the Closed Direction and Leak Testing during Cold Shutdown

- Basis for Exception from O&M Part 10, Subsection 4.2.1.2:

  These valves cannot be exercised during power operation because a flow path does not exist due to the higher RCS pressure. The Safety Injection Tank pressure is less than RCS pressure during power operation. Also, these check valves cannot be exercised during Cold Shutdowns because the RCS does not contain sufficient volume to accept the flow required and a low temperature overpressure condition of the RCS could result.

- Alternate Testing:

  Check Valves will be full-stroke exercised in the open direction during Refueling Outages by "dumping" the Safety Injection Tanks to the Reactor Vessel. Test parameters such as SI tank level decrease vs. time, SI tank pressure, valve differential pressure, flow rate etc. are used to determine a flow coefficient. The minimum flow coefficient was determined using the safety analysis data provided by the NSSS vendor. Comparing this minimum flow coefficient as acceptance criteria to the flow coefficient determined by testing, assures FCS the valve is able to perform its safety function. This method of testing the check valves complies with the guidance provided in Generic Letter 89-04, Attachment 1, Position 1. Additionally, valves SI-208, SI-212, SI-216 and SI-220 will be partial-stroke exercised at Cold Shutdown frequency in the open direction using Shutdown Cooling flow.

5. **Code Exception Number E5 - Relief Request**

- DELETED

6. **Code Exception Number E6 - Periodic Testing of Relief Valves**

- Components:

  FW-1525

- Function:

  Auxiliary Feedwater Pump Oil Cooler Relief Valve

- Class:

  3

- Test Requirements:

  A Minimum of 20% of Each Type and Manufacture Shall be Tested Within any 48 Months.

- Basis for Exception from O&M Part 1 Subsection 1.3.5(b):

  The relief valve is the only one of its type and manufacturer in its respective group. The intent of the Code is that all Class 3 relief valves be tested at least once every ten years (Reference O&M Part 1, Subsection 1.3.5(b)). This intent will be met. The current Refueling Outage frequency is 18 months. A review of historical maintenance records reveals that there have been no maintenance problems which justify testing the relief valve every other refueling outage. The scope of O&M Part 1 is to verify valve operability and detect any degradation in valve performance.

- Alternate Testing:

  The relief valve will be tested every third refueling outage.

PART 3: CLASS 1, CLASS 2, AND CLASS 3 PUMP TESTS

1.0 Program Summary

The Inservice Testing (IST) Program for ASME Class 1, 2 and 3 pumps was developed in accordance with and meets the requirements of ASME Operation and Maintenance of Nuclear Power Plants (O&M) 1987 Edition, 1988 Addenda. The IST for pumps will remain in effect for the remainder of the 120-month interval which began on September 26, 1993. The Program will be reviewed and updated, as appropriate, with that Edition of the Code in effect not more than 12 months prior to the start of the next 120-month interval.

The function of each pump in the Program is described in Section 3.8. Section 3.9 contains individual pump test requirements and exceptions to the Code (Table 3.1), as well as the codes used in the Table. Appendix 3A contains justifications for exceptions taken to the Code test requirements as provided for in 10CFR50.55a(g)(5)(iii). Justifications are general in nature and pertain to requirements found to be impractical. Code exceptions are numbered and referenced by number on the Pump Test Program Table 3.1.

2.0 Scope and Responsibility

2.1 The P&IDs of Part 4 identify the location of each Class 1, Class 2, and Class 3 pump.

2.2 Class 1, Class 2, and Class 3 pumps are to be tested in accordance with Part 6 of the O&M Manual. The test methods for each pump, and exceptions to the tests of O&M Part 6, are found in Appendix 3A.

3.0 Inservice Test Frequency

The inservice test frequency for Class 1, Class 2, and Class 3 pumps are in accordance with Part 6 of the O&M Manual, with exceptions as found in Table 3.1 and Appendix 3A.

4.0 Test Methods

The methods to be used to test Class 1, Class 2, and Class 3 pumps have been determined from Part 6 of the O&M manual. These methods, along with exceptions, are listed in Table 3.1 and Appendix 3A.

5.0 Evaluation of Test Results

The allowable ranges of test results shall be in accordance with Table 3 of Part 6 of the O&M Manual, as appropriate. All test data shall be analyzed within 96 hours after completion of a test in accordance with Part 6 of the O&M Manual.

If test data show that a pump is operating in the "Alert Range", remedies shall be taken, as required in accordance with O&M Part 6, until corrective action is taken. If the test data show that a pump is operating in the "Required Action Range," the pump shall be declared inoperable until corrective action is taken. Corrective action is defined as one or more of the following steps:

5.1 Recalibrate the applicable instruments and reperform the test, or

5.2 Repair or replace the component as required, or

5.3 Perform an Engineering Analysis to demonstrate that the pump is still able to perform its required safety design function.

6.0 Records and Reports

Records and reports for the testing of Class 1, Class 2, and Class 3 pumps shall be made in accordance with Part 6, Subsection 7, of the O&M Manual.

7.0 Repair Requirements

Tests, after pump replacement, repair or servicing, shall be made as required by O&M Part 6, Subsection 4.4.

8.0 Function of Pumps in the Program

8.1 Auxiliary Feedwater (AFW) Pumps

FW-6 and FW-10 are the motor driven and the steam driven AFW pumps, respectively. They supply makeup water to the Steam Generators during startup/shutdown conditions. Subsequent to an automatic initiation signal when normal feedwater flow is unavailable, they supply water to the Steam Generators.

8.2 Component Cooling Water (CCW) Pumps

AC-3A, AC-3B and AC-3C are the three CCW Pumps. They supply cooling water to safety-related components in the Containment and Auxiliary Buildings, including components containing radioactive or potentially radioactive fluids. They provide cooling water to Containment air coolers and the Control Room air conditioning units during both normal and accident conditions. In the event of a design basis accident, these pumps provide sufficient cooling water to the Engineered Safeguards equipment. Additionally, they supply cooling water to components to support normal plant operation, and to remove heat from the RCS via the Shutdown Cooling Heat Exchangers during normal plant cooldowns.

8.3 Raw Water Pumps

AC-10A, AC-10B, AC-10C and AC-10D are the four Raw Water Pumps. They supply cooling water to the CCW Heat Exchangers. They also supply cooling water directly to select safety related components in the event the CCW System is unavailable. Additionally, they supply water to the Demineralized Water System.

8.4 Safety Injection Pumps

SI-1A and SI-1B are the two LPSI Pumps. They inject borated water into the reactor coolant system following a LOCA. Additionally, they serve as Shutdown Cooling pumps by supplying water to the Shutdown Cooling Heat Exchangers for removal of residual heat during normal plant cooldown.

SI-2A, SI-2B and SI-2C are the three HPSI Pumps. They inject borated water into the reactor coolant system following a LOCA. Additionally, they are used to maintain the required water level in the Safety Injection Tanks.

SI-3A, SI-3B and SI-3C are the three CS Pumps. They spray borated water into the Containment to remove energy from the Containment vapor space after the initiation of a pressurization event in containment. Although there is a possibility of physically aligning the CS Pumps for Shutdown Cooling, that alignment should only be considered when the RCS is below 120°F and tne RCS is vented to the Containment atmosphere with the vent area equivalent to a twelve-inch diameter pipe.

8.5 Chemical Volume and Control Pumps

CH-1A, CH-1B and CH-1C are the three Charging Pumps. CH-4A and CH-4B are the two Boric Acid Pumps. These five pumps inject concentrated borated water into the RCS under emergency conditions. These pumps also serve several non-safety related functions.

8.6 Diesel Generator Fuel Oil Transfer Pumps

FO-4A-1, FO-4A-2 and FO-4B-1, FO-4B-2 are the four Diesel Generator Fuel Oil Transfer Pumps. They take suction from the underground fuel oil storage tank and transfer fuel oil to the wall mounted auxiliary tanks.

9.0 Pump Test Program Table (Table 3.1)

This section provides a tabulation of all safety related pumps, both those pumps that are tested in accordance with the requirements of O&M Manual Part 6, and those pumps for which the Code requirements have been found to be impractical.

10.0 Additions to Program - Pumps

Pumps added to the ISI Program Plan as a result of plant/system modifications, engineering changes or re-evaluation of component eligibility requirements as per O&M Manual, Part 6, are considered operable based on interim acceptance criteria (established by construction or preoperational tests) until a reference value is able to be established.

PUMP TABLES

TABLE FORMAT
FORT CALHOUN STATION PUMP TEST PROGRAM MATRIX TABLE 3.1

The Pump Test Program Table has been coded to provide the following information:

1. **System and Drawing Number** - System the pump is in and the P&ID number.

2. **Coordinates** - Location on the P&ID where the pump is found.

3. **Pump Number** - Unique number assigned to each pump.

4. **Speed n** - This parameter is addressed with one of the following entries, which indicate test applicability, interval, or Code exception number, respectively.

   - NR - Not Required
   - Q - Quarterly Test
   - E1, E2, E3, E4 - Code Exception Number

5. **Inlet Pressure P_i** - Same as number 4.

6. **Differential Pressure ΔP** - Same as number 4.

7. **Flow Rate Q** - Same as number 4.

8. **Vibration Amplitude V** - Same as number 4.

   V_d - Displacement (peak-peak)
   V_v - Velocity (peak)

9. **Discharge Pressure (P)** - Same as number 4.

10. **Code Exceptions** - If the pump is being tested in accordance with O&M Part 6 requirements, this column will be blank. However, for pumps which the O&M Part 6 requirements have been found to be impractical, a reference number is entered in this column. The reference number is addressed in Appendix 3A with a complete explanation of the specific exception and justification for that exception.

FORT CALHOUN NUCLEAR POWER STATION UNIT NO.1
PUMP TEST PROGRAM TABLE 3.1

SYSTEM & DRAWING NUMBER	COORDINATES	PUMP NUMBER	SPEED n*	INLET PRESSURE (P_1)	DIFFERENTIAL PRESSURE (ΔP)	FLOW RATE (Q)	VIBRATION DISPLACEMENT (V_d) Velocity (V_v)#	DISCHARGE PRESSURE (P) **	CODE EXCEPTIONS
AUX. FEEDWATER ++ 11405-M-253 SHEET 4	C-5 B-5	FW-6 FW-10	NR Q	Q Q	Q Q	Q Q	Q Q	Q Q	
COMPONENT ++ COOLING WATER 11405-M-10 SHEET 2	E-6 D-6 C-6	AC-3A AC-3B AC-3C	NR NR NR	Q Q Q	Q Q Q	Q Q Q	Q Q Q	Q Q Q	E4 E4 E4
RAW WATER ++ 11405-M-100	A-7 A-6 A-5 A-4	AC-10A AC-10B AC-10C AC-10D	NR NR NR NR	E1 E1 E1 E1	E1 E1 E1 E1	Q Q Q Q	Q Q Q Q	Q Q Q Q	E1, E4 E1, E4 E1, E4 E1, E4
SAFETY ++ INJECTION E-23866-210-130 SHEETS 1 AND 3	B-3 A-3 E-3 C-3 D-5 C-3 D-3 E-3	SI-1A SI-1B SI-2A SI-2B SI-2C SI-3A SI-3B SI-3C	NR NR NR NR NR NR NR NR	E1 E1 E1 E1 E1 E1 E1 E1	E1 E1 E1 E1 E1 E1 E1 E1	E2 E2 E2 E2 E2 E2 E2 E2	Q Q Q Q Q Q Q Q	Q Q Q Q Q Q Q Q	E1, E2 E1, E2 E1, E2 E1, E2 E1, E2 E1, E2 E1, E2 E1, E2
CHEMICAL VOLUME AND CONTROL ++ E-23866-210-120 SHEET 1 OF 2 E-23866-210-121	A-6 C-6 E-6 A-3 B-6	*+ CH-1A *+ CH-1B *+ CH-1C ++ CH-4A ++ CH-4B	NR NR NR NR NR	NR NR NR E1 E1	NR NR NR E1 E1	E3 E3 E3 Q Q	Q Q Q Q Q	Q Q Q Q Q	 E1 E1
DIESEL GENERATOR FUEL OIL 11405-M-262 SHEET 1	D-6 C-6 F-6 E-6	FO-4A-1 FO-4B-1 FO-4A-2 FO-4B-2	NR NR NR NR	NR NR NR NR	NR NR NR NR	Q Q Q Q	Q Q Q Q	Q Q Q Q	

* SYNCHRONOUS OR INDUCTION MOTORS DO NOT REQUIRE SPEED CHECK (O&M PART 6, SUBSECTION 4.6.3)
** REQUIRED FOR POSITIVE DISPLACEMENT PUMPS (O&M PART 6, SUBSECTION 5.2 TABLE 2)

\+ VIBRATION DISPLACEMENT (P-P) FOR < 600 RPM, VIBRATION VELOCITY (PEAK) FOR ≥ 600 RPM (O&M PART 6, SUBSECTION 4.6.4, TABLE 3A)
++ PUMP SPEED > 600 RPM
*+ PUMP SPEED ≤ 600 RPM

APPENDIX 3A

JUSTIFICATION FOR EXCEPTION TO O&M MANUAL PART 6 FOR PUMPS

APPENDIX 3A

JUSTIFICATION FOR EXCEPTION
TO O&M MANUAL PART 6 FOR PUMPS

1. **Code Exception Number E1 - Relief Request**

- Components:

  Raw Water Pumps AC-10A, AC-10B, AC-10C, AC-10D
  Low Pressure Safety Injection Pumps SI-1A, SI-1B
  High Pressure Safety Injection Pumps SI-2A, SI-2B, SI-2C
  Containment Spray Pumps SI-3A, SI-3B, SI-3C
  Boric Acid Pumps CH-4A, CH-4B

- Class:

  2
  3

- Test Requirements:

  Measurement of Pump Inlet Pressure and Differential Pressure

Raw Water Pumps

- Basis for Exception O&M Part 6, Subsection 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

- Alternate Testing:

  The pump inlet pressure will be calculated based on the river level and the elevation of the pump suction bells. The pump differential pressure will then be calculated based on the measured discharge pressure and the calculated inlet pressure. Since (1) the river provides the required positive pressure at the suction of the pumps, (2) the river level does not change when a pump is started, and (3) at least one pump is usually in service, the calculated inlet pressure prior to starting a pump is the same as with a pump running.

LPSI, HPSI and Containment Spray Pumps

- Basis for Exception from O&M Part 6, Subsections 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

1. **Code Exception Number E1 - Relief Request (Continued)**

- Alternate Testing:

  The LPSI, HPSI and CS pumps take their suction directly from the Safety Injection and Refueling Water Tank and have inlet pressures due to the level of water in the tank above the pump inlets. The pump inlet pressures will be calculated based on the tank level and the difference in elevation between the tank and the pump inlets. Pump differential pressures will then be calculated by subtracting the calculated inlet pressure from the measured discharge pressures. Since the Safety Injection and Refueling Water Tank provides the required positive pressure at the suction of the pumps and since the tank level does not significantly change when a pump is started, the calculated pump inlet pressure prior to starting a pump is the same as with a pump running. Flow losses through the suction piping of these pumps are negligible. Since the losses would be the same from test to test, not including them in the test would still enable pump degradation to be identified.

Boric Acid Pumps

- Basis for Exception for O&M Part 6, Subsections 4.6.2.2, 5.2 and Table 2:

  System design does not include instrumentation for direct measurement of inlet and differential pressure.

- Alternate Testing:

  The Boric Acid Pumps take their suction directly from the Boric Acid Tanks and have an inlet pressure due to the level of acid in the tanks above the pump inlet. The pump inlet pressure will be calculated based on the Boric Acid Storage Tank level and the elevation difference between the tank level and the pump inlet. Pump differential pressure will then be calculated by subtracting the calculated inlet pressure from the measured discharge pressure.

2. **Code Exception Number E2 - Relief Request**

- Components:

  Low Pressure Safety Injection Pumps SI-1A, SB
  High Pressure Safety Injection Pumps SI-2A, B, C
  Containment Spray Pumps SI-3A, B, C

- Class:

  2

- Test Requirements:

  Measurement of Flow Rate Quarterly

Low Pressure Safety Injection Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the LPSI pumps cannot be measured while they are operating on the minimum flow recirculation line because flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the RCS. This flow path cannot be utilized because the pump discharge pressure cannot overcome the RCS pressure.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a Cold Shutdown frequency when an instrumented flow path to the RCS is available. This is in accordance with Position 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to the Generic Letter 89-04.

2. Code Exception Number E2 - Relief Request (Continued)

Containment Spray Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the CS Pumps cannot be measured while they are operating on the minimum flow recirculation line because the flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the Containment spray headers which would result in water damage to equipment in Containment. Additionally, as approved by Amendment 136, Technical Specifications 2.1.1 states that the CS pumps will not be lined up on the shutdown cooling flow path until RCS temperature is below 120°F and a vent path is available. This is due to the fact that the suction side piping is designed to DBA conditions (60 psig) and valves on the suction piping are designed to 150 psig.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a refueling outage frequency when an instrumented flow path to the RCS is available. This is in accordance with Item 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to Generic Letter 89-04.

High Pressure Safety Injection Pumps

- Basis for Exception from O&M Part 6, Subsection 5.1 and Table 2:

  The flow rate of the HPSI pumps cannot be measured while they are operating on the minimum flow recirculation line because the flow measurement instrumentation is not installed on this line. The pump minimum flow recirculation line must be used when testing these pumps Quarterly during power operation, because the only other flow path is into the RCS which cannot be utilized because the pump discharge pressure cannot overcome the RCS pressure.

- Alternate Testing:

  In addition to the Quarterly mini-flow test, pump flow rate will be measured on a refueling outage frequency when an instrumented flow path to the RCS is available. This is in accordance with Position 9 (Pump Testing Using Minimum Flow Line With or Without Flow Measuring Devices) of Attachment 1 to Generic Letter 89-04.

3. **Code Exception Number E3 - Relief Request**

- DELETED

4. Code Exception Number E4 - Relief Request

- Components

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

- Class

  3

- Test Requirements

  Section 5.2 of OM-6 requires that the system resistance be varied until either the measured differential pressure or measured flow rate equals the corresponding reference value. The quantities listed in Table 2 of OM-6 are then measured or observed and compared to the corresponding reference value. Rather than set the applicable pumps at a reference value, the licensee proposes to establish a range of values (pump curves) and test the pumps in the as-found operating condition.

- Basis for Exception from O&M Part 6, Subsection 5.2 Table 2:

  The Raw Water (RW) and Component Cooling Water (CCW) systems at Fort Calhoun Station (FCS) are designed such that the total pump flow cannot be adjusted to one specific value for the purpose of testing without adversely affecting the system flow balance and technical specification operability requirements. Therefore, the RW and CCW pumps must be tested in a manner that the RW and CCW loops remain properly flow balanced during and after the testing. In addition, certain supplied loads (e.g. cooling of Control Element Drive Mechanisms) must remain fully operable per Technical Specifications to maintain the required level of plant safety during power operation.

  The RW and CCW systems loops are not designed with full flow test lines with single throttle valves. Therefore, the flow cannot be throttled to a fixed reference value every time a pump test is performed. Total pump flow rate can only be measured using the total flow indication as installed and read on the supply headers. There are no valves available in any of the loops, on either the supply or return lines, for the purpose of throttling total RW or CCW system flows. Only the flow of the served components are able to be individually throttled. The main loops of RW and CCW are piped in parallel with each other. Many loads are throttled to flow ranges specified in the FCS Design Basis Documents (DBD). All loads are aligned in parallel, and receive RW/CCW flow when the RW/CCW pumps are running regardless of

which served components are in service. During power operation, certain loops of RW/CCW are required to be operable per Technical Specifications. Specific loops/components of RW/CCW cannot be taken out of service for testing without entering an action statement for a Limiting Condition for Operation (LCO). Also, exceeding certain individual component flows/temperatures (e.g., reactor coolant pump seals) can require plant shutdown in two hours, depending on the load in question.

Certain RW/CCW loops are flow balanced during each refueling outage (at a nominal 18-month frequency) to ensure that all loads are adequately supplied. Flow ranges are specified for these loads in order to balance flows against each other. Once properly flow balanced, minimal flow adjustment can be made for any one particular load without adversely impacting the operability of the remaining loads (i.e., increasing flow for one load reduces flow for all of the others). Each time the system is flow balanced, proper individual component flows are produced, but this in turn does not necessarily result in one specific value for total flow. Because certain loads have an acceptable flow range, overall system full flow (the sum of the individual component flows) also has a range. Consequently, the Code requirements to quarterly adjust RW/CCW loop flow to one specific flow value for the performance of inservice testing conflicts with FCS system design and component operability requirements (i.e., flow balance) as required by Technical Specifications.

- Alternate Testing

As discussed above in the Test Requirements section, it is extremely difficult to return to a specific value of flow rate or differential pressure for testing of these pumps. Multiple reference points could be established according to the Code, but obtaining reference values at every possible point, even over a small range is not feasible. An alternative to the testing requirements of OM Part 6, Section 5.2, is to base the acceptance criteria on a reference pump curve. Flow rate and differential pressure are measured/calculated during inservice testing and compared to an established baseline reference curve. In addition, trending is accomplished by taking the ratio of the reference curve differential pressure versus flow and the actual differential pressure versus flow.

The following elements are used in developing and implementing the reference pump curves:

4. **Code Exception Number E4 - Relief Request (Continued)**

1. A reference pump curve (differential pressure vs. flow) has been established for RW pumps AC-10A, AC-10B, AC-10C, and AC-10D, and for CCW pumps AC-3A, AC 3B, and AC-3C from data taken on these pumps when they were known to be operating acceptably. These pump curves represent pump performance close to the original manufacturer's pump test data.

2. Pump curves are based on four or more test points whenever possible. Rated capacities of these pumps are 6,000 - 7,000 gpm for the RW pumps and 4,500 - 5,500 gpm for the CCW pumps.

3. To reduce the uncertainty associated with the pump curves and to ensure the adequacy of the acceptance criteria, all instruments used in establishing the baseline reference pump curves either meet or exceed the Code required accuracy.

4. The reference baseline pump curves are compared to the manufacturer's pump curves which were validated during plant preoperational testing.

5. Review of the pump hydraulic data trend plots indicates close correlation with established pump reference curves, thus validating the accuracy of the pump curves to assess the pumps' operational readiness.

6. The reference pump curves are based on differential pressure vs. flow. See the attached sample AC-3A and AC-10A pump acceptance criteria sheets. Areas for Required Action are as required per OM-6. Areas for Acceptable, Alert, and Required Action are as required per OM-6. These acceptance criteria limits do not conflict with operability criteria (minimum operability).

7. Only a small portion of the established reference curve is being used to accommodate flow rate variance due to flow balancing of various system loads.

8. Review of recent vibration data trend plots indicates that the change in vibration readings over the range of the pump curves being used is insignificant; therefore, only one fixed reference value has been assigned for each vibration measurement location.

9. After maintenance or repair that may affect the existing baseline reference pump curves, a new reference pump curve is determined or the existing pump curve revalidated by an inservice test. The design of the FCS RW and CCW systems and the Technical Specification requirements make it impractical to adjust system flows to a fixed reference value for inservice testing without adversely affecting the system flow balance and Technical specification operability

4. Code Exception Number E4 - Relief Request (Continued)

requirements. Proposed alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and will adequately detect pump degradation. The proposed alternate testing will have no adverse impact on plant or public safety.

- Conclusion

Relief to use pump curves for testing the RW and CCW pumps is granted pursuant to 10CFR50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements to test pumps at a reference value of either differential pressure and measure flow, or flow and measure differential pressure. The granting of relief is in consideration of the adequacy of an alternative method of testing and the burden if the Code requirements were imposed.

PART 4 REFERENCES

1. Fort Calhoun Station Technical Specifications.

2. ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition.

3. ASME/ANSI Operation and Maintenance of Nuclear Power Plants, 1987 Edition, 1988 Addenda.

4. NRC Generic Letter No. 89-04, "*Guidance on Developing Acceptable Inservice Testing Programs*".

5. NRC's Safety Evaluation Report on Revisions 3 and 4 of the Fort Calhoun Station's Inservice Inspection/Testing Program Plan (1983-1993), dated December 22, 1988 and July 3, 1989, respectively.

6. NRC's Safety Evaluation Report on Revision 5 of the Fort Calhoun Station's Inservice Inspection/Testing Program Plan (1983-1993), dated March 13, 1990.

7. NRC's Safety Evaluation Report on Revision 0 of the Fort Calhoun Station's Inservice Testing Program Plan Third Ten Year Interval (1993 - 2003), dated June 21, 1994.

8. Letter from NRC (W. H. Bateman) to OPPD (T. L. Patterson), dated April 6, 1995 (NRC 95-071).

9. ASME Code Cases Incorporated into the FCS ISI Program Plan

   Code Case N-416* Alternative Rules for Hydrostatic Testing of Repair or Replacement of Class 2 Piping Section XI Division 1.
   Approval Date: December 5, 1984

   Code Case N-416-1 Alternative Pressure Test Requirement for Welded Repairs on Installation of Replacement Items by Welding, Class 1, 2, and 3, Section XI Division 1.

   Code Case N-461* Alternative Rules for Piping Calibration Block Thickness.
   Approval Date: November 30, 1988

   Code Case N-481* Alternative Examination Requirements for Cast Austenitic Pump Casings.
   Approval Date: March 5, 1990

   Code Case N-491* Alternative Rules for Examination of Class 1, 2, 3 and MC Component Supports of Light-Water Cooled Power Plants.
   Approval Date: March 14, 1991

Code Case N-498-1**	Alternative Rules for Ten-year System Hydrostatic Pressure Testing for Class 1, 2, and 3 Systems. Approval Date: May 11, 1994

* Code cases approved by NRC-Reference NRC Regulatory Guide 1.147.
** Code cases approved by NRC-Refer to NRC Letter dated January 30, 1995 (NRC 95-017)

9. The following OPPD Piping and Instrumentation Drawings:

Number	Title
11405-M-1	*Containment Heating Cooling & Ventilating System*
11405-M-5	*Demineralized Water System*
11405-M-6	*Waste Disposal System*
11405-M-7	*Waste Disposal System*
11405-M-10	*Auxiliary Coolant Component Cooling System*
11405-M-12	*Primary Plant Sampling System*
11405-M-13	*Plant Air System*
11405-M-40	*Auxiliary Coolant Component Cooling System Flow*
11405-M-42	*Nitrogen, Hydrogen, Methane, Propane & Oxygen Gas System*
11405-M-98	*Waste Disposal System*
11405-M-100	*Raw Water System*
11405-M-252	*Steam System*
11405-M-253	*Steam Generator Feedwater & Blowdown System*
11405-M-254	*Condensate System*
11405-M-262	*Fuel Oil System*
11405-M-264	*Instrument Air System*
E-23866-210-110	*Reactor Coolant System*
E-23866-210-120	*Chemical & Volume Control System*
E-23866-210-121	*Chemical & Volume Control System*
E-23866-210-130	*Safety Injection & Containment Spray System*
B120F07001	*Diesel Generator Starting Air System*
C-4175	*Control Valve Air Source Valve Lineup/Listing*
D-4078	*Reactor Coolant Gas Vent System*