ENCLOSURE 3

INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

ST. LUCIE PLANT ADMINISTRATIVE PROCEURE

ADM-29.01 REVISION 4

FPL	ST. LUCIE PLANT ADMINISTRATIVE PROCEDURE SAFETY RELATED	Procedure No. **ADM-29.01** Current Rev. No. **4** Effective Date: **02/24/00**

Title:

INSERVICE TESTING (IST) PROGRAM FOR PUMPS AND VALVES

Responsible Department: **OPERATIONS SUPPORT ENGINEERING**

Revision Summary

Revision 4 - Revised Section 6.25 to delete verbiage for phase in of updated program and add added reference to extension of Unit 1's first 10-year interval, revised Tables 1 and 2, added requirement to test valves V2338 and V2340 for Unit 1 and 2, and V2440, V3656, V3519, and V3547 for Unit 2, deleted relief request VR-20 and VR-22, deleted requirement to test common charging header relief valves V2311, added remote position verification test requirement for valves V2507, added quarterly closed requirement for Unit 1 HPSI recirc, deleted refueling justification RFJ-21 and added new relief request VR-08, added check valves recently installed, removed NaOH eductor check valves V07269 and V07270, added Unit 2 manual LPSI mini recir isol valves V3205 and V3676 to be cycled quarterly, and made other changes to relief requests and requirements throughout the procedure. (Jon Hallem, 02/15/00)

Revision 3 - Corrected testing interval references, deleted references to Pump Relief Request, corrected Hydrazine pump references, deleted references to vibration testing, added close stroke and fail safe testing, added new pump relief request, added new refuel justification, and added new cold shutdown justifications. (R. L. Womack, 08/17/99)

Revision 2 - Ensured that V6741 is in the closed position. (Gene Boyd, 05/27/99)

Revision	FRG Review Date	Approved By	Approval Date
0	12/08, 12/11/97 & 02/06/98	J. Scarola Plant General Manager	02/06/98
Revision	**FRG Review Date**	**Approved By**	**Approval Date**
4	02/15/00	R. G. West Plant General Manager	02/15/00
		N/A Designated Approver	

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ITM 4

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1.0 PURPOSE

1.1 This document is the IST Program for St. Lucie Plant, Units 1 and 2, based on the requirements of the ASME Boiler and Pressure Vessel Code, Section XI and ASME/ANSI OM-Code, "Operation and Maintenance of Nuclear Power Plants (the Code)."

2.0 REFERENCES

NOTE

One or more of the following symbols may be used in this procedure:

§ Indicates a Regulatory commitment made by Technical Specifications, Condition of License, Audit, LER, Bulletin, etc., and shall NOT be revised without Facility Review Group review and Plant General Manager approval.

¶ Indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.

Ψ Indicates a step that requires a sign-off on a data sheet.

2.1 Title 10, Code of Federal Regulations, Part 50

2.2 Updated Final Safety Analysis Report (UFSAR), St. Lucie Units 1 and 2

2.3 St. Lucie Units 1 and 2 Plant Technical Specifications

2.4 ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition

2.5 NRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

2.6 Minutes of the Public Meetings on Generic Letter 89-04

2.7 Supplement to Minutes of the Public Meetings on Generic Letter 89-04 by J.G. Partlow, September 26, 1991

2.8 NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

2.0 REFERENCES (continued)

2.9 ASME/ANSI OM-Code-1987 w/88a Addenda, Operation and Maintenance of Nuclear Power Plants

2.10 FPL Letter to NRC No. L-98-243 dated September 21, 1998, IST Program Request For Additional Information.

2.11 FPL Letter to NRC No. L-98-264 dated October, 1998, IST Program Request For Additional Information.

¶1 **2.12** CR 99-0331

2.13 St. Lucie Flow Diagrams (P&IDs)

UNIT 1

Drawing Number/Sheet	Rev	Title
8770-G-078/110A	22	Reactor Coolant System
8770-G-078/110B	22	Reactor Coolant System
8770-G-078/120A	14	Chemical and Volume Control
8770-G-078/120B	13	Chemical and Volume Control
8770-G-078/121A	26	Chemical and Volume Control
8770-G-078/121B	26	Chemical and Volume Control
8770-G-078/130A	21	Safety Injection System
8770-G-078/130B	19	Safety Injection System
8770-G-078/131A	19	Safety Injection System
8770-G-078/131B	16	Safety Injection System
8770-G-078/150	9	Sampling System
8770-G-078/160A	13	Waste Management System
8770-G-078/163A	27	Waste Management System
8770-G-078/163B	27	Waste Management System
8770-G-079/1	41	Main Steam System
8770-G-079/7	3	Main Steam System
8770-G-080/3	41	Feedwater and Condensate Systems
8770-G-080/4	31	Feedwater and Condensate Systems
8770-G-082/2	14	Circulating and Intake Cooling Water System
8770-G-083/1A	52	Component Cooling System
8770-G-083/1B	49	Component Cooling System

2.0 REFERENCES (continued)

2.13 St. Lucie Flow Diagrams (P&IDs) (continued)

UNIT 1
(continued)

Drawing Number/Sheet	Rev	Title
8770-G-084/1C	38	Domestic & Make-up Water Systems
8770-G-085/1A	33	Service Air System
8770-G-085/2A	33	Instrument Air System
8770-G-085/3	17	Instrument Air System
8770-G-086/1	34	Miscellaneous Systems
8770-G-088/1	38	Containment Spray and Refueling Water Systems
8770-G-088/2	40	Containment Spray and Refueling Water Systems
8770-G-091/1	1	Miscellaneous Systems
8770-G-092/1	24	Miscellaneous Sampling Systems
8770-G-093	36	Miscellaneous Systems
8770-G-096/1A	13	Emergency Diesel Generator System - Diesel Engine 1A1
8770-G-096/1B	12	Emergency Diesel Generator System - Diesel Engine 1A2
8770-G-096/1C	13	Emergency Diesel Generator System - Air Start Pkg. 1A
8770-G-096/2A	11	Emergency Diesel Generator System - Diesel Engine 1B1
8770-G-096/2B	11	Emergency Diesel Generator System - Diesel Engine 1B2
8770-G-096/2C	11	Emergency Diesel Generator System - Air Start Pkg. 1B
8770-G-878	25	HVAC - Control Diagrams (Sheet 1)
8770-G-879	31	HVAC - Control Diagrams (Sheet 2)

2.0 REFERENCES (continued)

2.13 St. Lucie Flow Diagrams (P&IDs) (continued)

UNIT 2

Drawing Number/Sheet	Rev	Title
2998-G-078/107	8	Reactor Coolant System
2998-G-078/108	3	Reactor Coolant System
2998-G-078/109	10	Reactor Coolant System
2998-G-078/120	13	Chemical and Volume Control
2998-G-078/121A	21	Chemical and Volume Control
2998-G-078/121B	20	Chemical and Volume Control
2998-G-078/122	16	Chemical and Volume Control
2998-G-078/130A	16	Safety Injection System
2998-G-078/130B	21	Safety Injection System
2998-G-078/131	9	Safety Injection System
2998-G-078/132	7	Safety Injection System
2998-G-078/153	5	Sampling System
2998-G-078/160A	6	Waste Management System
2998-G-078/163A	15	Waste Management System
2998-G-078/163B	13	Waste Management System
2998-G-079/1	28	Main Steam System
2998-G-080/2A	30	Feedwater and Condensate Systems
2998-G-080/2B	31	Feedwater and Condensate Systems
2998-G-082/2	43	Circulating and Intake Cooling Water System
2998-G-083/1	34	Component Cooling System
2998-G-083/2	31	Component Cooling System
2998-G-084/1	28	Domestic & Make-up Water Systems
2998-G-085/1	21	Service Air System
2998-G-085/2A	32	Instrument Air System
2998-G-085/2C	35	Instrument Air System
2998-G-086/1	33	Miscellaneous Systems

2.0 REFERENCES (continued)

2.13 St. Lucie Flow Diagrams (P&IDs) (continued)

UNIT 2
(continued)

Drawing Number/Sheet	Rev	Title
2998-G-088/1	29	Containment Spray and Refueling Water Systems
2998-G-088/2	28	Containment Spray and Refueling Water Systems
2998-G-091/1	21	Miscellaneous Systems
2998-G-092/1	18	Miscellaneous Sampling Systems
2998-G-096/1A	11	Emergency Diesel Generator System - Diesel Engine 2A1
2998-G-096/1B	11	Emergency Diesel Generator System - Diesel Engine 2A2
2998-G-096/1C	11	Emergency Diesel Generator System - Air Start Pkg. 2A
2998-G-096/2A	10	Emergency Diesel Generator System - Diesel Engine 2B1
2998-G-096/2B	10	Emergency Diesel Generator System - Diesel Engine 2B2
2998-G-096/2C	8	Emergency Diesel Generator System - Air Start Pkg. 2B
2998-G-878	23	HVAC - Control Diagrams (Sheet 1)
2998-G-879/2	17	HVAC - Control Diagrams (Sheet 2)
2998-G-879/3	23	HVAC - Control Diagrams (Sheet 3)
2298-1014	2	Air Control and Hydraulic Spd Control

3.0 RESPONSIBILITIES

3.1 The Systems Performance Group (SPG) is responsible for the following:

1. Ensuring plant changes that affect the scope and testing details of pumps and valves within the jurisdiction of the Code are reviewed to incorporate any required changes into the Program for applicable pumps and valves. Plant changes include, but are not limited to, the following:

A. Revisions to Operating Procedures (normal, abnormal and emergency)

B. Revisions to plant operating parameters that are used for determining acceptance criteria; and

C. Plant modifications

2. Obtaining approval for relief from Code requirements.

3. Reviewing this procedure when required as a result of Code updating in accordance with 10 CFR 50.55a or other regulatory directives.

4. Filing the Inservice Testing Program Plan and changes with the appropriate regulatory authorities.

4.0 DEFINITIONS

4.1 All definitions pertinent to the Inservice Testing Program are included in the appropriate appendices.

5.0 RECORDS REQUIRED

5.1 This procedure shall be maintained in the plant files in accordance with QI-17-PSL-1, Quality Assurance Records.

6.0 INSTRUCTIONS

6.1 Inservice Testing Requirements

The inservice testing requirements identified in this Plan verify the operational readiness of ISI Class 1, 2 and 3 pumps and valves which have a specific function in mitigating the consequences of an accident or in bringing the reactor to a safe shutdown.

In this regard, the general requirements of Part 6, Paragraph 1.1 and Part 10, Paragraph 1.1 of the Code are applied to the Program scope determination as it applies to ISI Class 1, 2 and 3. Specifically, components to be included are:

- Centrifugal and positive displacement pumps that are provided with an emergency power source and required to perform a specific function in shutting down the reactor to the safe shutdown condition, maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

- Valves (and their actuating and position indicating systems) which are required to perform a specific function in shutting down the reactor to the safe shutdown condition, maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

In those cases where FPL has optionally classified and constructed a system, or portion of a system, to Class 2 or Class 3 requirements, inclusion of pumps and valves so classified are not required to be included in the testing program per ASME B&PV Code, Section XI, Paragraph IWA-1320(e). Where such components are included in the Program at FPL's option, they will be identified as such.

The general Code requirements were applied to St. Lucie Units 1 and 2 to determine the Program scope using a systematic approach by first reviewing the function of each of the plant systems as they relate to a limited number of bounding accident scenarios. This review eliminated systems (and associated components) that clearly do not fit the basic Code definitions including that of ISI boundary classification or that are specifically excluded by the Code.

6.0 INSTRUCTIONS (continued)

6.1 Inservice Testing Requirements (continued)

Next, a series of rules or guidelines were developed that established the criteria to be used during the review of the remaining systems and components. These rules establish the policies and assumptions that were applied in the analysis to ensure consistency. Each of these is outlined below. From this point, in a series of steps, each of the individual components in the remaining significant safety systems (and supporting systems) were evaluated with respect to the function of each component and the need for its function as it relates to the scope of Section XI. These steps included:

1. A review of flow diagrams of each system and identification of any components (pumps or valves) that could potentially be included in the IST Program scope. Based on the reviewer's experience, valves used for maintenance isolation, vents, drains, etc. were excluded. Typically, all pumps, power-operated valves, check valves and safety valves remained in the population designated for further evaluation.

2. Each system was broken down by component and, based on general system operational requirements, a narrative description of each components' safety function(s) during various proposed scenarios was drafted.

3. Sequentially, plant documents that refer to or discuss safety-related components or system functions were reviewed in detail, and information from these documents was compared to the information developed in the above step 2. Where appropriate, corrections and references were applied to the individual narratives. Documents reviewed included the following:

   - Updated Final Safety Analysis Reports (UFSARs)
   - Technical Specifications
   - Plant System Descriptions (Training) Documents
   - Special Analyses
   - Commitment Correspondence
   - Plant Operating Procedures
   - Emergency Operating Procedures
   - 10 CFR 50, Appendix J, Leakrate Test Program
   - PSL Design Basis Documents

6.0 INSTRUCTIONS (continued)

6.1 Inservice Testing Requirements (continued)

4. Based on the finalized component safety function evaluation derived from the document review and the corrected narratives, the IST Program testing requirements were then established by applying the guidelines listed in Section 6.2 to each one.

5. The functional descriptions of the system components were subjected to a comprehensive final review by knowledgeable plant personnel to confirm the accuracy of the document.

END OF SECTION 6.1

6.0 INSTRUCTIONS (continued)

6.2 IST Program Testing Requirement Guidelines

The following guidelines are set forth for evaluation of system components (pumps and valves) with respect to their inclusion in the St. Lucie IST Program and to what extent testing will be performed.

1. Where multiple components are capable of performing the same equivalent and redundant specified function (e.g., multiple valves closing in series) and where the components are not supplied by alternate and redundant power supplies, only one needs to be included in the program. The component must be relied upon to perform and not simply have the capability of performance. This exemption only applies where licensing documents do not take credit for the designed redundancy (e.g., single failure criteria). Components performing a redundant function shall be included in the testing program if, in the process of analysis or licensing justification, they are relied upon to be operable.

2. The St. Lucie Unit 1 and 2 UFSARs and related design basis documents shall be the primary references for determining which components are required to perform specified functions related to the spectrum of predicated accidents. Although several other plant source documents (e.g., Tech Specs and EOPs) identify various components that may be important to plant safety or may be operated in conjunction with recovery from an accident, unless specific credit is taken in the plant safety analysis (or is implied in the analysis) for a pump or valve, the component need not be included in the IST Program. The exceptions to this are those cases where the NRC may impose test requirements at their discretion.

3. Valves installed primarily for the purpose of providing convenient operational flexibility (e.g., system cross-connects) that are not required to operate, assuming that the designated first-line systems and components operate satisfactorily, need not be included in the IST Program. This does not exclude active valves that could be called upon as a result of optional system lineups existing prior to the initiation of an accident.

6.0 INSTRUCTIONS (continued)

6.2 IST Program Testing Requirement Guidelines (continued)

4. Valves that are actuated as a result of a safety system automatic response shall be included in the IST Program to the extent that the testing shall verify valve operation required as a result of the safety system input. This applies only if valve movement is required to support those functions required as specified by the Code. This requirement extends only to testing defined by the Code and is not intended to imply the need for verifying a valves' response to automatic logic system output.

5. Valves whose sole function is to provide system or component redundancy related to failure of passive components need not be included if a set of all of the active components (pumps and valves) needed to fulfill the specified system (train) function as tested - double or unrelated simultaneous failures need not be assumed. In some cases where protection of critical systems from passive failures is a commitment or licensing basis, the appropriate mitigating components shall be included in the testing program.

6. System safety/relief valves shall be included where the function of the valve is to provide overpressure protection to system components that perform a specific function in shutting down the reactor to the safe shutdown condition, maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

7. All valves included in the St. Lucie leakrate testing program complying with 10 CFR 50, Appendix J, shall be included in the IST Program as Category A or AC valves.

8. All valves designated as high-low pressure interface valves (pressure isolation valves) shall be included in the IST Program as Category A or AC valves.

9. Any active Category A valve shall be designated for testing (exercising) to the closed position.

6.0 INSTRUCTIONS (continued)

6.2 IST Program Testing Requirement Guidelines (continued)

10. When a valves' normal position during operation is its position required to perform its designated safety function, and valve movement may be required due to plant evolutions or possible repositioning during accident response or recovery operations, then periodic exercising per the Code is required (i.e., the valve can not be considered passive). For check valves, if the valve is physically locked or held in position or flow in the line is blocked with a normally closed stop valve, then the check valve may be considered to be passive. (Ref. NUREG-1482)

11. Where an air- or hydraulic-operated valve is provided with a simple non-redundant pilot valve arrangement, the pilot valve(s) need not be specifically included in the IST Program provided that the testing performed on the main valve verifies the proper operation of the pilot valve(s).

12. Control valves are specifically excluded from testing per Part 10, Paragraph 1.2(a); however, if a control valve must change position to perform a safety-related function, then it must be included in the IST Program and tested as applicable.

13. Check valves are included where a valve serves as the only effective boundary between piping associated with a necessary safety function and non-safety grade (non-seismic) piping. Unless otherwise stated in the plant design documents, failure of passive system components is assumed only for non-safety grade systems.

14. Where a valve performs a safety function in both directions (open and closed), exercising in both directions is required. For these power-operated valves, stroke time measurements in both directions are typically required.

15. Pumps and valves whose only safety function is predicated on plant shutdown and recovery from a fire per a commitment made as a result of 10 CFR 50, Appendix R, are not necessarily required to be included in the IST Program.

6.0 INSTRUCTIONS (continued)

6.2 IST Program Testing Requirement Guidelines (continued)

16. Pumps and valves that are not categorized as ISI Class 1, 2, or 3 need not be included in the IST Program; however, in some cases they may be included as "augmented" testing.

17. Check valves that have a safety function to close should be evaluated with respect to categorization as Category A/C versus C with respect to the following issues:

A. Whether the flow requirements for connected systems can be achieved with the maximum possible leakage through the check valve.

B. The effect on the performance of other components and systems due to the reduced flow resulting from the leakage.

C. The consequences of loss of fluid from the system.

D. The effect that backflow through a valve may have on piping and components, such as the effect of high temperature and thermal stresses.

E. The radiological exposure to plant personnel and the public caused by the leak.

18. Where a major component contains pumps or valves that form a composite subsystem such that overall operation of the major component reflects proper operation of the subcomponents, then the subcomponents can be designated as **skid-mounted** and individual testing is not required. For example, steam turbine governor valves are considered to be an integral part of the turbine and, as such, need not be included in the IST Program.

END OF SECTION 6.2

6.0 INSTRUCTIONS (continued)

6.3 Inservice Testing Program for Pumps

1. Code Compliance

This IST Program for pumps meets the requirements of Part 6 of the Code and any interpretations or additional requirements, as appropriate, imposed by NRC Generic Letter 89-04 and NUREG-1482. Where these requirements have been determined to be impractical, conformance would cause unreasonable hardship without any compensating increase in safety, or an alternate test provides an acceptable level of quality and safety, relief from Code requirements is requested pursuant to the requirements of 10 CFR 50.55a, NRC Generic Letter 89-04 and NUREG-1482. Where pumps are included in the Program and testing is determined to be optional per ASME B&PV Code, Section XI, Paragraph IWA-1320(e), deviations from Code requirements may arise due to practicality considerations. In such cases relief may not be requested; however, if relief is formalized in a relief request, it should be considered as a means for documentation only and regulatory approval is not required.

2. Allowable Ranges of Test Quantities

The allowable ranges for test parameters as specified in Part 6, Table 3, will be used for all measurements of pressure, flow and vibration except as provided for in specific relief requests.

3. Testing Intervals

The test frequency for pumps included in the Program will be as set forth in Part 6, Paragraph 5.1, and related relief requests. A band of +25 percent of the test interval may be applied to a test schedule as allowed by the St. Lucie Technical Specifications to provide for operational flexibility.

4. Pump Program Table

Table 1 lists those pumps included in the IST Program with references to parameters to be measured and applicable requests for relief.

6.0 INSTRUCTIONS (continued)

6.3 Inservice Testing Program for Pumps (continued)

5. Relief Requests for Pump Testing

Appendix A includes the relief requests related to pump testing.

END OF SECTION 6.3

6.0 INSTRUCTIONS (continued)

6.4 Inservice Testing Program for Valves

1. Code Compliance

This IST Program for valves meets the requirements of Part 10 of the Code and any interpretations or additional requirements, as appropriate, imposed by NRC Generic Letter 89-04 and NUREG-1482. Where these requirements have been determined to be impractical, conformance would cause unreasonable hardship without any compensating increase in safety, or an alternate test provides an acceptable level of quality and safety, relief from Code requirements is requested pursuant to the requirements of 10 CFR 50.55a, NRC Generic Letter 89-04 and NUREG-1482. Where valves are included in the Program and testing is determined to be optional per ASME B&PV Code, Section XI, Paragraph IWA-1320(e), deviations from Code requirements may arise due to practicality considerations. In such cases relief may not be requested; however, if relief is formalized in a relief request, it should be considered as a means for documentation only and regulatory approval is not required.

2. Testing Intervals

The test frequency for valves (excluding safety/relief valves) included in the Program will be as set forth in Part 10, Paragraphs 4.2 and 4.3, and related relief requests. A band of +25 percent of the test interval may be applied to a test schedule as allowed by the St. Lucie Technical Specifications to provide for operational flexibility. Where quarterly exercise testing of valves is impractical or otherwise undesirable, testing may be performed during cold shutdown and refueling periods as permitted by Part 10, Paragraphs 4.2.1.2 and 4.3.2.2. Justifications for such deferred testing are provided in Appendices C, D and E.

3. Check Valve Testing

Full-stroke exercising of check valves to the open position using system flow requires that a test be performed whereby the predicted (required) full accident condition flowrate through the valve be verified and measured. Any deviation to this requirement must satisfy the requirements of NRC Generic Letter 89-04, Position 1.

6.0 INSTRUCTIONS (continued)

6.4 Inservice Testing Program for Valves (continued)

4. Valve Program Table

Tables 2 and 3 list those valves included in the IST Program with references to required testing, respective test intervals and applicable requests for relief.

5. Relief Requests for Valve Testing

Appendix B includes the relief requests related to valve testing. Unless otherwise stated, relief requests are common to both units. When alternate testing or inspection plans are specified using sampling plans, unless otherwise stated, the two units are considered to be separate and independent - Units 1 and 2 valves are not to be considered part of the same sample population.

END OF SECTION 6.4

6.0 INSTRUCTIONS (continued)

6.5 Authority

The St. Lucie IST Program is based on the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition and ASME/ANSI OM-Code, including OMA-88 Addenda, "Operation and Maintenance of Nuclear Power Plants."

This combined (Units 1 and 2) St. Lucie ASME Inservice Testing (IST) Program will be in effect for both units through the end of each unit's current 120-month (10-year) interval unless revised and reissued for reasons other than routine update required at the start of each unit's next 120-month interval per 10 CFR 50.55a. The inspection intervals are defined as follows:

UNIT	INTERVAL	BEGINS	ENDS
1	3	February 11, 1998*	February 10, 2008
2	2	August 8, 1993	August 7, 2003

* By letter L-85-431 dated November 13, 1985, Florida Power & Light Company (FPL) requested NRC's approval to extend the first ten-year inspection interval for St. Lucie Unit 1 to February 11, 1988. By letter dated November 20, 1985 (Denton to Williams), the NRC staff approved the expansion and, as a result, the second ten-year inservice testing interval for St. Lucie Unit 1 began February 11, 1988, and the third interval began February 11, 1998.

/R4

END OF SECTION 6.5

TABLE 1
UNITS 1 AND 2 PUMP TABLES
(Page 1 of 3)

LEGEND

Pump Number	Alpha-numeric designator indicated on the respective flow diagram.
Description	Generic name/function of the pump.
CL	ISI Classification per the associated ISI boundary drawing(s).
Coord	Corresponds to the flow diagram coordinates of the pump.
Test Parameters	The table indicates by a Y (yes) or N (no) that the specific parameter is measured, evaluated and recorded per the applicable Code requirement. If an N is indicated, the associated relief request number is also noted in the same column.
PR-XX	Where indicated this refers to the specific relief request (see Appendix B) related to any deviation regarding the measuring or analysis of a parameter.

TABLE 1

UNIT 1 PUMP TABLE

(Page 2 of 3)

PUMP NUMBER	DESCRIPTION	CL	COORD	SPEED	DIFF PRES.	FLOW RATE	VIBRA.	
AFW 1A	Auxiliary Feedwater	3	E-4	NA	Y	Y:PR-2	Y	
AFW 1B	Auxiliary Feedwater	3	C-4	NA	Y	Y:PR-2	Y	
AFW 1C	Auxiliary Feedwater	3	F-4	Y	Y	Y:PR-2	Y	
BAM 1A	Boric Acid Makeup	2	G-4	NA	Y	Y:PR-3	Y	
BAM 1B	Boric Acid Makeup	2	F-4	NA	Y	Y:PR-3	Y	
CHG 1A	Charging	2	C-2	NA	Y	Y	Y:PR-7	
CHG 1B	Charging	2	E-2	NA	Y	Y	Y:PR-7	
CHG 1C	Charging	2	G-2	NA	Y	Y	Y:PR-7	
CCW 1A	Component Cooling Water	3	F-6	NA	Y	Y	Y	
CCW 1B	Component Cooling Water	3	F-7	NA	Y	Y	Y	
CCW 1C	Component Cooling Water	3	F-7	NA	Y	Y	Y	
CS 1A	Containment Spray	2	G-6	NA	Y	Y:PR-4	Y	
CS 1B	Containment Spray	2	H-6	NA	Y	Y:PR-4	Y	
DOT 1A	Diesel Fuel Oil Transfer	3**	B-2	NA	Y	Y:PR-10**	Y	
DOT 1B	Diesel Fuel Oil Transfer	3**	D-2	NA	Y	Y:PR-10**	Y	
HPSI 1A	Hi Press Safety Injection	2	C-3	NA	Y	Y:PR-5	Y	
HPSI 1B	Hi Press Safety Injection	2	G-3	NA	Y	Y:PR-5	Y	
ICW 1A	Intake Cooling Water	3	H-5	NA	Y	Y	Y	
ICW 1B	Intake Cooling Water	3	H-7	NA	Y	Y	Y	
ICW 1C	Intake Cooling Water	3	H-6	NA	Y	Y	Y	
LPSI 1A	Lo Press Safety Injection	2	F-3	NA	Y:PR-13	Y:PR-6	Y:PR-12	/R4
LPSI 1B	Lo Press Safety Injection	2	G-3	NA	Y:PR-13	Y:PR-6	Y:PR-12	/R4

** Optional Classification - Relief Request approval not required - provided for information only.

TABLE 1

UNIT 2 PUMP TABLE

(Page 3 of 3)

PUMP NUMBER	DESCRIPTION	CL	COORD	SPEED	DIFF PRES.	FLOW RATE	VIBRA.	
AFW 2A	Auxiliary Feedwater	3	B-4	NA	Y	Y:PR-2	Y	
AFW 2B	Auxiliary Feedwater	3	E-4	NA	Y	Y:PR-2	Y	
AFW 2C	Auxiliary Feedwater	3	F-3	Y	Y	Y:PR-2	Y	
BAM 2A	Boric Acid Makeup	2	F-4	NA	Y	Y:PR-3	Y	
BAM 2B	Boric Acid Makeup	2	G-4	NA	Y	Y:PR-3	Y	
CCW 2A	Component Cooling Water	3	E-6	NA	Y	Y	Y	
CCW 2B	Component Cooling Water	3	E-6	NA	Y	Y	Y	
CCW 2C	Component Cooling Water	3	E-6	NA	Y	Y	Y	
CHG 2A	Charging	2	G-2	NA	Y	Y	Y:PR-7	
CHG 2B	Charging	2	E-2	NA	Y	Y	Y:PR-7	
CHG 2C	Charging	2	B-2	NA	Y	Y	Y:PR-7	
CS 2A	Containment Spray	2	G-5	NA	Y	Y:PR-4	Y	
CS 2B	Containment Spray	2	H-5	NA	Y	Y:PR-4	Y	
DOT 2A	Diesel Fuel Oil Transfer	3**	B-2	NA	Y	Y:PR-10**	Y	
DOT 2B	Diesel Fuel Oil Transfer	3**	D-2	NA	Y	Y:PR-10**	Y	
HPSI 2A	Hi Press Safety Injection	2	B-3	NA	Y	Y:PR-5	Y	
HPSI 2B	Hi Press Safety Injection	2	F-3	NA	Y	Y:PR-5	Y	
HYD 2A	Hydrazine	2	G-3	Y	Y:PR-9	Y:PR-9	N:PR-8	/R4
HYD 2B	Hydrazine	2	H-3	Y	Y:PR-9	Y:PR-9	N:PR-8	/R4
ICW 2A	Intake Cooling Water	3	H-5	NA	Y	Y	Y	
ICW 2B	Intake Cooling Water	3	H-7	NA	Y	Y	Y	
ICW 2C	Intake Cooling Water	3	H-6	NA	Y	Y	Y	
LPSI 2A	Lo Press Safety Injection	2	E-3	NA	Y:PR-13	Y:PR-6	Y	/R4
LPSI 2B	Lo Press Safety Injection	2	F-3	NA	Y:PR-13	Y:PR-6	Y	/R4

** Optional Classification - Relief Request approval not required - provided for information only.

END OF TABLE 1

TABLE 2

UNIT 1 VALVE TABLE

(Page 1 of 40)

LEGEND

VALVE NUMBER	FPL alpha-numeric designator for the subject valve
COORD	Coordinate location of the valve on the designated drawing
CL	ISI classification of the valve as per the respective ISI boundary drawing
CAT	Valve category per Part 10, Paragraph 1.4
SIZE	Valve nominal size (NPS) in inches
TYPE	Valve type
(A/P)	Active (A) or Passive (P) determination for the valve
ACT. TYPE	Valve actuator type as follows:
AO	Air-operated
DO	Diaphragm-operated (Air)
MO	Electric motor-operated
MAN	Manual valve
PO	Piston-operated (Air)
S/A	Self-actuated
SO	Solenoid-operated
NORM POS.	Designates the normal position of the valve during plant operation at power
REM IND	Notes if a valve has remote position indication
FAIL MODE	Identifies the failure mode (open or closed) for a valve. FAI- valve fails as-is.
EXAM	Identifies the test requirements for a valve as follows:
CV/C	Check valve exercise to closed position
CV/O	Check valve full-stroke exercise to open position
CV/PO	Check valve partial-stroke exercise to open position
EC	Exercise to closed position. For all category A or B power-operated valves stroke times will be measured unless excluded by an associated relief request.

TABLE 2

UNIT 1 VALVE TABLE

(Page 2 of 40)

LEGEND

(continued)

EXAM (continued)	
EE	Exercise valve to verify proper operation and stroking with no stroke time measurements. Requires observation of system parameters or local observation of valve operation.
EO	Exercise to open position. For all category A or B power-operated valves stroke times will be measured unless excluded by an associated relief request.
FS	Fail-safe test
INSP	Disassembly and inspection of check valves
PI	Position indication verification
REPL	Replacement per Paragraph 1.3.4.2
SLT-1	Seat leakrate test per 10 CFR 50, Appendix J
SLT-2	Seat leakrate test for pressure isolation valves
SP	Special test - see applicable relief request
SRV	Set point check for safety/relief valves
VBT	Set point check for vacuum breaker valves
TEST FREQ	The required test interval as follows:
QR	Quarterly (during plant operation)
CI	Determined by Containment Leakage Rate Testing Program in accordance with 10 CFR 50, Appendix J, Option B.
CS	Cold shutdown as defined by Technical Specifications
RF	Each reactor refueling outage (cycle)
SP	Special test frequency - refer to relief request for details
6M	Every six months
18M	Every 18 months
2Y	Every 2 years
5Y	Every 5 years per Part 1, Paragraph 1.3.3.1(b) or 1.3.4.2
10Y	Every 10 years per Part 1, Paragraph 1.3.41(b)
RELIEF REQ	Refers to the specific relief request associated with the adjacent test requirement. (See Appendix E)

TABLE 2

UNIT 1 VALVE TABLE

(Page 3 of 40)

P&ID: 8770-G-078 SH 110A
SYSTEM: REACTOR COOLANT SYSTEM

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
PCV-1100E	F-7	1	B	3.000	Angle	A	DO	O/C	Yes	FC	EC FS PI	CS CS 2Y		
PCV-1100F	G-7	1	B	3.000	Angle	A	DO	O/C	Yes	FC	EC FS PI	CS CS 2Y		
V1200	C-4	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		
V1201	C-4	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		
V1202	C-5	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		
V1402	C-2	1	B	2.500	Globe	A	SO	C	Yes	FC	EO FS PI	CS CS 2Y		
V1403	C-3	1	B	2.500	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V1404	B-2	1	B	2.500	Globe	A	SO	C	Yes	FC	EO FS PI	CS CS 2Y		
V1405	B-3	1	B	2.500	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V1441	F-1	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1442	G-1	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1443	D-2	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1444	D-2	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		

TABLE 2

UNIT 1 VALVE TABLE

(Page 4 of 40)

P&ID: 8770-G-078 SH 110A
SYSTEM: REACTOR COOLANT SYSTEM (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V1445	E-1	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1446	E-1	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1449	G-2	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		

P&ID: 8770-G-078 SH 120B
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-02-1	F-5	2	B	2.000	Gate	P	MO	C	Yes	FAI	PI	2Y		
MV-02-2	F-5	2	B	2.000	Globe	P	MO	C	Yes	FAI	PI	2Y		
SE-02-01	D-6	1	B	2.000	Globe	A	SO	O	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SE-02-02	C-6	1	B	2.000	Globe	A	SO	O	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SE-02-03	F-6	1	B	2.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
SE-02-04	E-6	1	B	2.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V02132	C-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR		
V02133	E-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR		

TABLE 2

UNIT 1 VALVE TABLE

(Page 5 of 40)

P&ID: 8770-G-078 SH 120B

SYSTEM: CHEMICAL AND VOLUME CONTROL (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks	
V02134	G-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR			
V2315	B-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y			
V2318	D-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y			
V2321	F-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y			
V2324	F-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y			
V2325	D-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y			
V2326	B-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y			
V2338	C-3	2	B	2	Gate	A	MAN	LO	No		EC	QR			/R4
V2340	A-3	2	B	2	Gate	A	MAN	C	No		EO	QR			/R4
V2430	B-5	2	C	2.000	Check	A	S/A	O	No		CV/PO CV/O	QR RF	RFJ-01		
V2431	F-7	1	C	2.000	Check	A	S/A	C	No		CV/PO CV/0	CS RF	RFJ-01		
V2432	D-7	1	C	2.000	Check	A	S/A	O	No		CV/PO CV/O	QR CS			
V2433	C-7	1	C	2.000	Check	A	S/A	O	No		CV/O	QR			
V2515	G-7	1	A	2.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI			
V2516	G-6	1	A	2.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI			
V2435	C-6	1	C	2.000	Check	A	S/A	C	No		CV/O	QR			/R4

TABLE 2
UNIT 1 VALVE TABLE
(Page 6 of 40)

P&ID: 8770-G-078 SH 121A
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-01-01	C-2	2	A	0.750	Globe	A	SO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
V2115	D-5	3	C	4.000	Relief	A	S/A	C	No		SRV	10Y		
V2118	E-5	2	C	4.000	Check	A	S/A	O	No		CV/C CV/0	CS QR		
V2191	F-5	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-02 RFJ-02	
V2501	E-5	2	B	4.000	Gate	A	MO	O	Yes	FAI	EC EO PI	CS CS 2Y		
V2504	F-5	3	B	3.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
V2505	C-3	2	A	0.750	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
V2507	B-2	2	B	0.750	Gate	P	SO	C	Yes	FC	PI	2Y		
V2525	G-4	3	B	4.000	Gate	A	MO	C	Yes	FAI	EC PI	QR 2Y		
V2526	D-5	3	C	4.000	Check	A	S/A	O	No		CV/O	QR		
V2621	C-4	3	B	3.000	Gate	A	MAN	O	No	FAI	EE	QR		

/R4

/R4

TABLE 2

UNIT 1 VALVE TABLE

(Page 7 of 40)

P&ID: 8770-G-078 SH 121B
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-2161	G-5	2	B	1.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
V2177	H-5	2	C	3.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-02 RFJ-02	
V2190	G-2	2	C	3.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-02 RFJ-02	
V2443	F-4	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-02 RFJ-02	
V2444	G-4	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-02 RFJ-02	
V2508	F-3	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
V2509	F-2	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
V2510	H-3	2	B	1.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
V2511	D-4	2	B	1.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
V2514	H-5	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		

TABLE 2
UNIT 1 VALVE TABLE
(Page 8 of 40)

P&ID: 8770-G-078 SH 130A
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks	
V3101	B-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-03 RFJ-03		/R4
V3103	F-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-03 RFJ-03		/R4
V3401	C-2	2	C	6.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-04 RFJ-04		
V3410	G-2	2	C	8.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-04 RFJ-04		
V3412	F-6	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y			
V3414	G-4	2	C	3.000	Stp-Ck	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-05 RFJ-05		
V3417	C-6	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y			
V3427	C-4	2	C	3.000	Stp-Ck	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-05 RFJ-05		
V3430	F-2	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y			
V3431	B-2	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y			
V3654	G-5	2	B	6.000	Gate	P	MO	LO	Yes	FAI	PI	2Y			
V3656	D-5	2	B	6.000	Gate	P	MO	LO	Yes	FAI	EC PI	QR 2Y			/R4
V3662	F-2	2	B	4.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y			
V3663	B-2	2	B	4.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y			

TABLE 2

UNIT 1 VALVE TABLE

(Page 9 of 40)

P&ID: 8770-G-078 SH 130B
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-3306	G-5	2	B	10.000	Globe	A	PO	LO	Yes	FO	EC PI	QR 2Y		
HCV-3657	F-6	2	B	10.000	Globe	A	DO	LC	Yes	FC	EO PI	QR 2Y		
MV-03-2	H-5	2	B	10.000	Globe	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
SR-07-1A	F-2	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
SR-07-1B	G-2	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V03920	B-4	3	B	2.000	Globe	A	MAN	C	No	FAI	EE	QR		
V07000	F-2	2	C	14.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-06 RFJ-06	
V07001	G-2	2	C	14.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-06 RFJ-06	
V07009	A-4	2	A	2.000	Globe	A	MAN	LC	No		EE SLT-1	QR CI		
V3104	F-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-07 RFJ-07	
V3105	F-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-07 RFJ-07	
V3106	F-4	2	C	10.000	Check	A	S/A	C	No		CV/C CV/O	QR CS		
V3107	G-4	2	C	10.000	Check	A	S/A	C	No		CV/C CV/O	QR CS		
V3206	F-4	2	B	10.000	Gate	A	MO	LO	Yes	FAI	EC EO PI	QR QR 2Y		
V3207	G-4	2	B	10.000	Gate	A	MO	LO	Yes	FAI	EC EO PI	QR QR 2Y		
V3407	A-4	3	C	0.500	Relief	A	S/A	C	No		SRV	10Y		

TABLE 2

UNIT 1 VALVE TABLE

(Page 10 of 40)

P&ID: 8770-G-078 SH 130B
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3432	G-2	2	B	14.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3439	H-7	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3444	F-2	2	B	14.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3452	C-2	2	B	12.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3453	D-2	2	B	12.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3456	D-7	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3457	E-7	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3463	A-4	2	A	2.000	Globe	P	MAN	LC	No		EE SLT-1	QR CI		
V3466	A-3	3	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
V3659	A-7	2	B	3.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3660	B-7	2	B	3.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3661	B-3	3	B	1.000	Globe	P	DO	C	Yes	FC	PI	2Y		

TABLE 2
UNIT 1 VALVE TABLE
(Page 11 of 40)

P&ID: 8770-G-078 SH 131A
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-03-1E	G-4	2	A	0.375	Needle	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-03-1F	G-4	2	A	0.375	Needle	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
HCV-3615	A-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3616	B-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3617	B-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3625	C-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3626	C-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR PI		
HCV-3627	D-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR PI		
HCV-3635	E-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR PI		
HCV-3636	F-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR PI		
HCV-3637	F-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR PI		

TABLE 2
UNIT 1 VALVE TABLE
(Page 12 of 40)

P&ID: 8770-G-078 SH 131A
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-3645	G-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3646	H-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3647	H-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-03-1A	C-2	2	B	2.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
MV-03-1B	E-3	2	B	2.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
V3113	B-3	1	AC	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF SP 2Y	VR-04 RFJ-08 RFJ-08	
V3114	A-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3123	C-3	1	AC	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF SP 2Y	VR-04 RFJ-08 RFJ-08	
V3124	C-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3133	F-3	1	AC	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF SP 2Y	VR-04 RFJ-08 RFJ-08	
V3134	E-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-078 SH 131A
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3143	H-3	1	AC	2.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF SP 2Y	VR-04 RFJ-08 RFJ-08	
V3144	G-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3468	D-2	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
V3469	D-6	1	C	1.000	Relief	A	S/A	C	No		SRV	5Y		
V3480	D-7	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3481	D-5	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3482	D-6	1	C	1.000	Relief	A	S/A	C	No		SRV	5Y		
V3483	D-2	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
V3651	E-5	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3652	E-7	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-078 SH 131B
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-3618	D-5	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3628	D-2	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3638	H-2	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3648	H-5	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3211	H-6	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3215	C-6	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3217	E-7	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3221	A-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3225	C-3	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3227	D-4	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3231	E-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-078 SH 131B
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3235	G-3	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3237	H-4	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3241	E-6	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3245	G-6	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3247	H-7	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3611	C-6	2	B	1.000	Gate	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
V3614	C-6	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3621	C-3	2	B	1.000	Gate	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
V3624	C-3	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3631	G-3	2	B	1.000	Gate	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-078 SH 131B
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3634	G-3	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3641	G-6	2	B	1.000	Gate	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
V3644	G-6	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		

P&ID: 8770-G-078 SH 150
SYSTEM: SAMPLING

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V5200	B-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5201	C-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5202	D-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5203	B-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5204	C-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5205	D-2	2	A	0.375	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-078 SH 160A
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V6301	G-4	2	A	3.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6302	G-5	2	A	3.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

P&ID: 8770-G-078 SH 163A
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V6554	B-6	2	A	1.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6555	B-5	2	A	1.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

P&ID: 8770-G-078 SH 163B
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
¶1 V6741	F-5	2	A	1.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6779	F-4	2	AC	1.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-25	

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TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-079 SH 1
SYSTEM: MAIN STEAM

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-08-1A	B-6	2	BC	34.000	Stp-ck	A	AO	O	Yes		EC PI	CS 2Y		
HCV-08-1B	E-6	2	BC	34.000	Stp-ck	A	AO	O	Yes		EC PI	CS 2Y		
HCV-08-2A	B-4	2	B	6.000	Angle	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
HCV-08-2B	E-4	2	B	6.000	Angle	A	DO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
MV-08-1A	B-6	2	B	3.000	Globe	A	MO	C	Yes	FAI	EC PI	QR 2Y		
MV-08-1B	E-6	2	B	3.000	Globe	A	MO	C	Yes	FAI	EC PI	QR 2Y		
MV-08-3	G-6	2	B	4.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
MV-08-13	H-4	2	B	3.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-14	H-3	2	B	3.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
V08117	B-6	2	C	34.000	Check	A	S/A	O	No		INSP CV/PO	RF SP	VR-07 VR-07	
V08130	G-4	2	C	4.000	Check	A	S/A	O	No		CV/C CV/O CV/PO CV/PO INSP	RF CS QR SP RF	VR-08 VR-08 VR-08	
V08148	E-6	2	C	34.000	Check	A	S/A	O	No		CV/PO INSP	SP RF	VR-07 VR-07	
V08163	G-4	2	C	4.000	Check	A	S/A	C	No		CV/C CV/O CV/PO CV/PO INSP	RF CS QR SP RF	VR-08 VR-08 VR-08	

/R4

/R4

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-079 SH 1
SYSTEM: MAIN STEAM (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V08372	H-4	2	C	0.750	Check	A	S/A	O	No		CV/C	RF	RFJ-22	
V08373	H-4	2	C	0.750	Check	A	S/A	O	No		CV/C	RF	RFJ-22	
V08384	H-4	2	B	0.750	Globe	A	MAN	O	No		EE	QR		
V08387	H-4	2	B	0.750	Globe	A	MAN	O	No		EE	QR		
V8201	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8202	A-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8203	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8204	A-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8205	E-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8206	D-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8207	E-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8208	D-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8209	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8210	A-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8211	B-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8212	A-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8213	E-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8214	D-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8215	E-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		
V8216	D-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-079 SH 7
SYSTEM: MAIN STEAM

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
RD-08-1A1	D-3	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
RD-08-1A2	D-2	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
RD-08-1A3	D-2	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
RD-08-1B1	G-3	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
RD-08-1B2	H-2	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
RD-08-1B3	H-2	NC	C	2.000	Rupdsk	A	S/A	C	No		REPL	5Y		
SE-08-1A1	C-4	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
SE-08-1A2	D-4	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
SE-08-1A3	A-4	NC	B	1.000	3WY	A	SO	C	No	FC	EO	CS		
SE-08-1A4	B-5	NC	B	1.000	3WY	A	SO	C	No	FC	EO	CS		
SE-08-1B1	G-4	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
SE-08-1B2	G-4	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
SE-08-1B3	E-4	NC	B	1.000	3WY	A	SO	C	No	FC	EO	CS		
SE-08-1B4	F-5	NC	B	1.000	3WY	A	SO	C	No	FC	EO	CS		

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-080 SH 3
SYSTEM: FEEDWATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-09-1	G-3	NC	B	20.000	Gate	A	MO	O	Yes	FAI	EC PI	CS 2Y		
MV-09-2	G-5	NC	B	20.000	Gate	A	MO	O	Yes	FAI	EC PI	CS 2Y		
MV-09-7	B-6	2	B	20.000	Gate	A	MO	O	Yes	FAI	EC PI	CS 2Y		
MV-09-8	D-6	2	B	20.000	Gate	A	MO	O	Yes	FAI	EC PI	CS 2Y		
V09248	A-6	2	C	20.000	Check	A	S/A	O	No		INSP	RF	VR-10	
V09252	B-7	2	C	18.000	Check	A	S/A	O	No		CV/O	QR		
V09280	C-6	2	C	20.000	Check	A	S/A	O	No		INSP	RF	VR-10	
V09294	C-7	2	C	18.000	Check	A	S/A	O	No		CV/O	QR		

P&ID: 8770-G-080 SH 4
SYSTEM: FEEDWATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-09-9	E-6	3	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-10	B-6	3	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-11	H-6	3	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-12	F-6	3	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
V09824	A-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09825	D-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09826	E-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09827	G-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-080 SH 4
SYSTEM: FEEDWATER (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V09107	E-4	3	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09119	E-7	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09120	E-7	2	B	4.000	Gate	A	MAN	LO	No		EE	QR		
V09123	C-4	3	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09135	B-7	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09136	B-7	2	B	4.000	Gate	A	MAN	LO	No		EE	QR		
V09139	F-4	3	C	6.000	Check	A	S/A	C	No		CV/O	CS		
V09151	H-7	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09152	H-7	2	B	4.000	Gate	A	MAN	LO	No		EE	QR		
V09157	F-7	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09158	F-7	2	B	4.000	Gate	A	MAN	LO	No		EE	QR		
V09303	E-3	3	C	2.000	Check	A	S/A	C	No		CV/PO INSP	QR RF	 RFJ-11	
V09304	C-3	3	C	2.000	Check	A	S/A	C	No		CV/PO CV/PO INSP	QR SP RF	VR-11 VR-11 VR-11	
V09305	D-3	3	C	2.000	Check	A	S/A	C	No		CV/PO CV/PO INSP	QR SP RF	VR-11 VR-11 VR-11	
V12174	C-2	3	C	8.000	Check	A	S/A	C	No		CV/O CV/PO	CS QR		
V12175	B-2	3	B	8.000	Gate	A	MAN	LC	No	FAI	EE	QR		
V12176	C-2	3	C	8.000	Check	A	S/A	C	No		CV/O CV/PO	CS QR		
V12177	B-2	3	B	8.000	Gate	A	MAN	LC	No	FAI	EE	CS		
V12497	C-1	3	B	8.000	Globe	A	MAN	LO	No	FAI	EE	CS		
V12506	C-1	3	B	8.000	Globe	A	MAN	LO	No	FAI	EE	QR		
V12507	F-2	3	C	0.750	Check	A	S/A	C	No		INSP	RF	RFJ-13	

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-082 SH 2
SYSTEM: INTAKE COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-21-2	F-4	3	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-21-3	G-4	3	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
SR-21-1A	B-5	3	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
SR-21-1B	B-6	3	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
TCV-14-4A	A-5	3	B	30.000	Butterfly	A	PO	O	No	FO	EO FS	QR QR		
TCV-14-4B	A-6	3	B	30.000	Butterfly	A	PO	O	No	FO	EO FS	QR QR		
V21162	G-5	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21205	G-6	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21208	G-7	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21402	D-5	3	C	2.000	Check	A	S/A	O	No		CV/O	QR		
V21403	D-6	3	C	2.000	Check	A	S/A	O	No		CV/O	QR		

P&ID: 8770-G-083 SH 1A
SYSTEM: COMPONENT COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-14-3A	F-1	3	B	14.000	Butterfly	A	PO	C	Yes	FO	EO FS PI	QR QR 2Y		
HCV-14-3B	F-2	3	B	14.000	Butterfly	A	PO	C	Yes	FO	EO FS PI	QR QR 2Y		
HCV-14-8A	D-4	3	B	16.000	Relief	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
HCV-14-8B	D-5	3	B	16.000	Relief	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-083 SH 1A

SYSTEM: COMPONENT COOLING WATER (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-14-9	H-5	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
HCV-14-10	H-6	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
MV-14-1	E-6	2	B	24.000	Butterfly	P	MO	C	Yes	FAI	PI	2Y		
MV-14-2	E-7	2	B	24.000	Butterfly	P	MO	C	Yes	FAI	PI	2Y		
MV-14-3	G-7	2	B	24.000	Butterfly	P	MO	C	Yes	FAI	PI	2Y		
MV-14-4	G-7	2	B	24.000	Butterfly	P	MO	C	Yes	FAI	PI	2Y		
MV-14-5	C-2	2	B	10.000	Butterfly	P	MO	O	Yes	FAI	PI	2Y		
MV-14-6	C-3	2	B	10.000	Butterfly	P	MO	O	Yes	FAI	PI	2Y		
MV-14-7	H-2	2	B	10.000	Butterfly	P	MO	O	Yes	FAI	PI	2Y		
MV-14-8	F-3	2	B	10.000	Butterfly	P	MO	O	Yes	FAI	PI	2Y		
SR-14-7A	E-2	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-14-7B	E-2	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-14-8A	A-3	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-14-8B	A-4	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-14-8C	A-1	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-14-8D	A-2	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V14143	F-6	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V14147	F-7	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V14151	F-7	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-083 SH 1B
SYSTEM: COMPONENT COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-14-1	D-6	2	A	8.000	Butterfly	A	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-2	E-7	2	A	8.000	Butterfly	A	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-6	D-7	2	A	8.000	Butterfly	P	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-7	D-6	2	A	8.000	Butterfly	P	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		

P&ID: 8770-G-084 SH 1C
SYSTEM: MAKE-UP WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-15-1	D-6	2	A	2.000	Gate	A	MO	C	Yes	FAI	EC PI SLT-1	QR 2Y CI		
V15328	D-5	2	AC	2.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-14	

TABLE 2

UNIT 1 VALVE TABLE

(Page 26 of 40)

P&ID: 8770-G-085 SH 1A
SYSTEM: SERVICE AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SH18797	F-2	2	A	1.000	Ball	P	MAN	LC	No		SLT-1	CI		
SH18798	E-2	2	A	1.000	Ball	P	MAN	LC	No		SLT-1	CI		
V18794	F-4	2	A	2.000	Globe	P	MAN	LC	No		SLT-1	CI		
V18796	F-4	2	A	2.000	Globe	P	MAN	LC	No		SLT-1	CI		

P&ID: 8770-G-085 SH 2A
SYSTEM: INSTRUMENT AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SR-18-6A	D-2	2	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-18-6B	D-1	2	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V18195	E-6	2	AC	2.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-15	
V18279	B-2	2	C	0.500	Check	A	S/A	C	No		CV/C	CS		
V18283	A-3	2	C	0.500	Check	A	S/A	C	No		CV/C	CS		
V18290	H-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18291	H-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18294	G-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18295	G-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	

P&ID: 8770-G-085 SH 2C
SYSTEM: INSTRUMENT AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-18-1	H-2	2	A	2.000	Gate	A	MO	O	Yes		EC PI SLT-1	QR 2Y CI		

TABLE 2
UNIT 1 VALVE TABLE
(Page 27 of 40)

P&ID: 8770-G-085 SH 3
SYSTEM: INSTRUMENT AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V18099	B-5	3	C	1.000	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18695	B-2	3	C	1.000	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18696	B-2	3	C	1.000	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18699	B-5	3	C	1.000	Check	A	S/A	C	No		CV/C	CS	VR-12	

P&ID: 8770-G-086 SH 1
SYSTEM: MISCELLANEOUS SYSTEMS

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-23-3	C-6	2	B	2.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-5	C-6	2	B	2.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-7	C-7	2	B	0.500	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-9	C-7	2	B	0.500	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
V17204	B-3	3**	C	1.500	Check	A	S/A	C	No		CV/PO CV/O	QR 2Y	VR-13 VR-13	
V17205	B-3	3**	B	1.500	GATE	A	MAN	LO	No	FAI	EE	QR		
V17207	B-3	3**	B	2.000	GATE	A	MAN	LC	No	FAI	EE	QR		
V17214	D-3	3**	C	1.500	Check	A	S/A	C	No		CV/PO CV/O	QR 2Y	VR-13 VR-13	
V17215	D-3	3**	B	1.500	GATE	A	MAN	LO	No	FAI	EE	QR		
V17217	D-3	3**	B	2.000	GATE	A	MAN	LC	No	FAI	EE	QR		
V17218	C-3	3**	B	2.000	GATE	A	MAN	LC	No	FAI	EE	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-088 SH 1
SYSTEM: CONTAINMENT SPRAY

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-07-1A	E-5	2	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-07-1B	E-5	2	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
RD-07-1	D-2	2	C	2.000	Ruptdsk	A	S/A	C	No		REPL	5Y		
SE-07-1A	G-1	2	B	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-07-1B	G-3	2	B	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-07-2A	G-1	2	B	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-07-2B	G-3	2	B	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SR-07-2	D-2	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V07119	E-6	2	C	24.000	Check	A	S/A	C	No		CV/C CV/PO CV/PO CV/C INSP	CS QR SP SP RF	 VR-14 VR-14 VR-14 VR-14	
V07120	E-6	2	C	24.000	Check	A	S/A	C	No		CV/C CV/PO CV/PO CV/C INSP	CS QR SP SP RF	 VR-14 VR-14 VR-14 VR-14	
V07129	H-6	2	C	12.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-16 RFJ-16	
V07130	H-7	2	B	12.000	Gate	A	MAN	O	No		EE	QR		
V07143	G-6	2	C	12.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-16 RFJ-16	

TABLE 2

UNIT 1 VALVE TABLE

(Page 29 of 40)

P&ID: 8770-G-088 SH 1
SYSTEM: CONTAINMENT SPRAY (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V07145	G-7	2	B	12.000	Gate	A	MAN	O	No		EE	QR		
V07231	D-2	2	C	2.000	Check	A	S/A	C	No		CV/O	QR		
V07232	D-2	2	C	2.000	Check	A	S/A	C	No		CV/O	QR		
V07256	G-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	RF RF	RFJ-17 RFJ-17	
V07258	H-4	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	RF RF	RFJ-17 RFJ-17	

/R4 (V07231)
/R4 (V07232)

/R4

P&ID: 8770-G-088 SH 2
SYSTEM: CONTAINMENT SPRAY

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-07-1A	B-3	2	B	12.000	Gate	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		
FCV-07-1B	D-3	2	B	12.000	Gate	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		
LCV-07-11A	G-2	2	A	2.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
LCV-07-11B	G-3	2	A	2.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
MV-07-2A	G-3	2	B	24.000	Butterfly	A	MO	C	Yes	FAI	EO EC PI	QR QR 2Y		

TABLE 2
UNIT 1 VALVE TABLE
(Page 30 of 40)

P&ID: 8770-G-088 SH 2
SYSTEM: CONTAINMENT SPRAY (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-07-2B	H-3	2	B	24.000	Butterfly	A	MO	C	Yes	FAI	EO EC PI	QR QR 2Y		
MV-07-3A	B-3	2	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
MV-07-3B	D-3	2	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
SR-07276	E-4	2	AC	0.750	Relief	A	S/A	C	No		SRV SLT-1	10Y CI		
SR-07277	E-4	2	AC	0.750	Relief	A	S/A	C	No		SRV SLT-1	10Y CI		
SR-07278	G-4	NC	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V07170	F-3	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07172	H-2	2	C	24.000	Check	A	S/A	C	No		INSP	RF	VR-16	
V07174	G-2	2	C	24.000	Check	A	S/A	C	No		INSP	RF	VR-16	
V07188	F-4	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07189	E-5	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07192	C-4	2	C	10.000	Check	A	S/A	C	No		INSP	RF	VR-17	
V07193	C-4	2	C	10.000	Check	A	S/A	C	No		INSP	RF	VR-17	
V07206	E-3	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		

P&ID: 8770-G-091 SH 1
SYSTEM: MISCELLANEOUS SYSTEMS

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V00101	B-4	2	A	8.000	Gate	P	MAN	LC	No		SLT-1	CI		
V00139	D-4	2	A	0.375	Globe	P	MAN	LC	No		SLT-1	CI		
V00140	E-4	2	A	1.000	Globe	P	MAN	LC	No		SLT-1	CI		
V00143	E-4	2	A	1.000	Globe	P	MAN	LC	No		SLT-1	CI		
V00144	D-4	2	A	0.375	Globe	P	MAN	LC	No		SLT-1	CI		

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-092 SH 1
SYSTEM: MISCELLANEOUS SAMPLING

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-26-1	B-2	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-2	B-2	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-3	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-4	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-5	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-6	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FSE-27-1	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-2	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-092 SH 1
SYSTEM: MISCELLANEOUS SAMPLING (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FSE-27-3	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-4	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-5	B-7	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-6	A-7	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-7	A-7	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-8	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-9	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-092 SH 1

SYSTEM: MISCELLANEOUS SAMPLING (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FSE-27-10	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-11	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
V27101	B-6	2	AC	0.375	Check	A	S/A	C	No		CV/C CV/O SLT-1	RF QR CI	RFJ-19	
V27102	B-6	2	AC	0.375	Check	A	S/A	C	No		CV/C CV/O SLT-1	RF QR CI	RFJ-19	
V27105	C-6	2	C	0.375	Check	A	S/A	C	No		CV/O	QR		
V27110	C-6	2	C	0.375	Check	A	S/A	C	No		CV/O	QR		

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-093
SYSTEM: MISCELLANEOUS SYSTEMS

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SB-37-1	C-6	3	B	54.000	Butterfly	A	AO	C	Yes	FO	EO FS PI	QR QR 2Y		
SB-37-2	C-7	3	B	54.000	Butterfly	A	AO	C	Yes	FO	EO FS PI	QR QR 2Y		

P&ID: 8770-G-096 SH 1A
SYSTEM: EDG SYSTEM - DIESEL ENGINE 1A1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1A	G-2	3**	B	2.000	Globe	A	SO	C	No	FC	EC EO FS	QR QR QR		
SH-59161	G-2	3**	B	2.000	Ball	P	MAN	LO	Yes		PI	2Y		
SR-59-1A1	D-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59010	B-4	3**	C	0.500	Check	A	S/A	O	No		CV/C	QR		
V59011	B-4	3**	C	0.500	Check	A	S/A	C	No		CV/O	QR		

** Optional Classification - Relief request approval not required, provided for information only.

P&ID: 8770-G-096 SH 1B
SYSTEM: EDG SYSTEM - DIESEL ENGINE 1A2

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SR-59-1A2	D-5	3**	C	0.750	Relief	A	SO	C	No		SRV	10Y		
V59025	G-4	3**	C	0.500	Check	A	S/A	O	No		CV/C	QR		
V59026	F-4	3**	C	0.500	Check	A	S/A	C	No		CV/O	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-096 SH 1C
SYSTEM: EDG SYSTEMS - AIR START PKG 1A

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-59-1A1	H-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-2A1	H-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-3A1	G-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-4A1	G-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-3A	G-2	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-4A	F-2	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-5A	G-4	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-6A	F-4	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SH59085	D-4	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59086	D-3	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59087	D-2	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59088	D-1	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SR-59-3A	C-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-4A	C-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	1OY		
SR-59-5A	C-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-6A	C-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59079	D-5	3**	C	1.000	Check	A	S/A	C	No		CV/C	QR		
V59156	D-5	3**	C	1.000	Check	A	S/A	C	No		CV/C	QR		
V59200	F-1	3**	C	0.375	Check	A	S/A	O	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59201	F-5	3**	C	0.375	Check	A	S/A	O	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-096 SH 2A
SYSTEM: EDG SYSTEMS - DIESEL ENGINE 1B1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1B	G-2	3**	B	2.000	Globe	A	SO	C	No	FC	EC EO FS	QR QR QR		
SH-59164	G-2	3**	B	2.000	Ball	P	MAN	LO	Yes		PI	2Y		
SR-59-1B1	D-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59040	B-4	3**	C	0.500	Check	A	S/A	O	No		CV/C	QR		
V59041	B-4	3**	C	0.500	Check	A	S/A	C	No		CV/O	QR		

** Optional Classification - Relief request approval not required, provided for information only.

P&ID: 8770-G-096 SH 2B
SYSTEM: EDG SYSTEMS - DIESEL ENGINE 1B2

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SR-59-1B2	D-5	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59055	F-4	3**	C	0.500	Check	A	S/A	O	No		CV/O	QR		
V59056	G-4	3**	C	0.500	Check	A	S/A	C	No		CV/C	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 2

UNIT 1 VALVE TABLE

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P&ID: 8770-G-096 SH 2C
SYSTEM: EDG SYSTEMS - AIR START PKG 1B

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-59-1B1	G-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-2B1	G-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-3B1	H-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-4B1	H-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-3B	H-2	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-4B	F-2	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-5B	G-4	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SE-59-6B	F-4	3**	B	1.500	Globe	A	SO	C	No	FC	EO	2Y	VR-18	
SH59131	D-4	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59132	D-3	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59133	D-2	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SH59134	D-1	3**	B	2.000	Ball	P	MAN	O	Yes		PI	2Y		
SR-59-3B	C-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-4B	C-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-5B	C-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-6B	C-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59125	D-5	3**	C	1.000	Check	A	S/A	C	No		CV/C	QR		
V59158	D-5	3**	C	1.000	Check	A	S/A	C	No		CV/C	QR		
V59202	F-1	3**	C	0.375	Check	A	S/A	O	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59203	F-5	3**	C	0.375	Check	A	S/A	O	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 2
UNIT 1 VALVE TABLE
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P&ID: 8770-G-878
SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-1	C-2	2	B	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI	CS CS 2Y		
FCV-25-2	C-3	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-3	C-3	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-4	C-6	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-5	C-7	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-6	C-8	2	B	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI	CS CS 2Y		
FCV-25-7	C-15	2	A	24.000	Butterfly	A	DO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FCV-25-8	C-15	2	A	24.000	Butterfly	A	DO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
V-25-12	N-8	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V-25-14	K-8	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V-25-16	M-8	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		

TABLE 2

UNIT 1 VALVE TABLE

(Page 39 of 40)

P&ID: 8770-G-878

SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V-25-20	C-14	2	AC	24.000	Check	A	S/A	C	No		CV/C VBT SLT-1	CS CS CI	VR-19 VR-19 VR-19	
V-25-21	C-14	2	AC	24.000	Check	A	S/A	C	No		CV/C VBT SLT-1	CS CS CI	VR-19 VR-19 VR-19	
V25011	N-7	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V25013	K-7	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V25015	N-7	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		

P&ID: 8770-G-879

SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-11	H-14	2	B	16.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-12	J-14	2	B	16.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-13	I-16	2	B	12.000	Butterfly	A	MO	O	Yes	FAI	EO PI	QR 2Y		
FCV-25-14	E-11	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-15	E-11	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-16	E-10	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		

TABLE 2

UNIT 1 VALVE TABLE

(Page 40 of 40)

P&ID: 8770-G-879

SYSTEM: HEATING, VENTILATION AND AIR CONDITION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-17	E-11	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-18	A-10	3	B	6.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-19	A-11	3	B	6.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-24	B-10	3	B	8.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-25	B-11	3	B	8.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V-25-23	J-14	2	C	8.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF		
V-25-24	H-14	2	C	8.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF		

END OF TABLE 2

TABLE 3

UNIT 2 VALVE TABLE

(Page 1 of 45)

LEGEND

VALVE NUMBER	FPL alpha-numerical designator for the subject valve
COORD	Coordinate location of the valve on the designated drawing
CL	ISI classification of the valve as per the respective ISI boundary drawing
CAT	Valve category per Part 10, Paragraph 1.4
SIZE	Valve nominal size (NPS) in inches
TYPE	Valve type
(A/P)	Active (A) or Passive (P) determination for the valve
ACT. TYPE	Valve actuator type as follows:
AO	Air-operated
DO	Diaphragm-operated (Air)
HYD	Hydraulic-operated
MO	Electric motor-operated
MAN	Manual valve
PO	Piston-operated (Air)
S/A	Self-actuated
SO	Solenoid-operated
NORM POS.	Designates the normal position of the valve during plant operation at power
REM IND	Notes if a valve has remote position indication
FAIL MODE	Identifies the failure mode (open or closed) for a valve. FAI- valve fails as-is.
EXAM	Identifies the test requirements for a valve as follows:
CV/C	Check valve exercise to closed position
CV/O	Check valve full-stroke exercise to open position
CV/PO	Check valve partial-stroke exercise to open position
EC	Exercise to closed position. For all category A or B power-operated valves stroke times will be measured unless excluded by an associated relief request.

TABLE 3

UNIT 2 VALVE TABLE

(Page 2 of 45)

LEGEND

(continued)

EXAM (continued)	
EE	Exercise valve to verify proper operation and stroking with no stroke time measurements. Requires observation of system parameters or local observation of valve operation.
EO	Exercise to open position. For all category A or B power-operated valves stroke times will be measured unless excluded by an associated relief request.
FS	Fail-safe test
INSP	Disassembly and inspection of check valves
PI	Position indication verification
SLT-1	Seat leakrate test per 10 CFR 50, Appendix J
SLT-2	Seat leakrate test for pressure isolation valves
SP	Special test requirement - see relief request
SRV	Set point check for safety/relief valves
VBT	Set point check for vacuum breaker valves
TEST FREQ	The required test interval as follows:
QR	Quarterly (during plant operation)
CI	Determined by Containment Leakage Rate Testing Program in accordance with 10 CFR 50, Appendix J, Option B.
CS	Cold shutdown as defined by Technical Specifications
RF	Each reactor refueling outage (cycle)
SP	Special test frequency - refer to relief request for details
6M	Every six months
18M	Every 18 months
2Y	Every 2 years
5Y	Every 5 years per Part 1, Paragraph 1.3.3.1(b) or 1.3.4.2
10Y	Every 10 years per Part 1, Paragraph 1.3.41(b)
RELIEF REQ	Refers to the specific relief request associated with the adjacent test requirement. (See Appendix E)

TABLE 3
UNIT 2 VALVE TABLE
(Page 3 of 45)

P&ID: 2998-G-078 SH 107
SYSTEM: REACTOR COOLANT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V1460	C-5	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1461	D-5	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1462	D-5	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1463	E-5	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1464	D-6	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1465	D-6	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V1466	E-6	2	B	1.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		

TABLE 3

UNIT 2 VALVE TABLE

(Page 4 of 45)

P&ID: 2998-G-078 SH 108
SYSTEM: REACTOR COOLANT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V1474	D-4	1	B	3.000	Globe	A	SO	C	Yes	FC	EO FS PI	CS CS 2Y		
V1475	F-4	1	B	3.000	Globe	A	SO	C	Yes	FC	EO FS PI	CS CS 2Y		
V1476	D-5	1	B	3.000	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V1477	F-5	1	B	3.000	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		

P&ID: 2998-G-078 SH 109
SYSTEM: REACTOR COOLANT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V1200	C-4	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		
V1201	C-4	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		
V1202	C-4	1	C	3.000	Safety	A	S/A	C	No		SRV	5Y		

P&ID: 2998-G-078 SH 120
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V2522	C-2	2	A	2.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		

TABLE 3
UNIT 2 VALVE TABLE
(Page 5 of 45)

P&ID: 2998-G-078 SH 121A
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks	
SR-02123	C-2	2	AC	1.000	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y			
V2115	E-4	3	C	4.000	Relief	A	S/A	C	No		SRV	10Y			
V2118	E-5	2	C	4.000	Check	A	S/A	O	No		CV/C CV/O	CS QR			
V2191	E-6	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-02 RFJ-02		/R4
V2501	D-5	2	B	4.000	Gate	A	MO	O	Yes	FAI	EC EO PI	CS CS 2Y			
V2504	F-6	2	B	3.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y			
V2505	C-3	2	A	0.750	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI			
V2507	B-2	2	B	0.750	Gate	P	SO	C	Yes	FC	PI	2Y			/R4
V2524	C-2	2	A	0.750	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI			
V2525	F-4	3	B	4.000	Gate	A	MO	C	Yes	FAI	EC PI	QR 2Y			
V2526	E-6	2	C	4.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-02 RFJ-02		
V2621	C-4	3	B	3.000	Gate	A	MAN	O	No	FAI	EE	QR			
V2674	D-5	3	C	4.000	Check	A	S/A	O	No		CV/O	QR			

TABLE 3

UNIT 2 VALVE TABLE

(Page 6 of 45)

P&ID: 2998-G-078 SH 121B
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-2210Y	F-6	2	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V2177	H-5	2	C	3.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-02 RFJ-02	
V2190	G-2	2	C	3.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-02 RFJ-02	
V2443	G-4	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-02 RFJ-02	
V2444	F-4	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF QR	 RFJ-02 RFJ-02	
V2508	F-3	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
V2509	F-2	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
V2514	H-5	2	B	3.000	Gate	A	MO	C	Yes	FAI	EO PI	QR 2Y		
V2650	H-4	2	B	1.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
V2651	D-4	3	B	1.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 122
SYSTEM: CHEMICAL AND VOLUME CONTROL

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-02-01	D-6	1	B	2.000	Globe	A	SO	O	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SE-02-02	C-6	1	B	2.000	Globe	A	SO	O	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SE-02-03	E-6	1	B	2.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
SE-02-04	E-6	1	B	2.000	Globe	A	SO	LC	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V2167	B-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR		
V2168	E-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR		
V2169	G-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/O	QR QR		
V2185	C-5	2	B	2.500	Gate	P	MO	C	Yes	FAI	PI	2Y		
V2318	D-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
V2321	F-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
V2324	F-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V2325	D-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V2326	B-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V2338	C-3	2	B	2	Gate	A	MAN	LO	No		EC	QR		
V2340	A-3	2	B	2	Gate	A	MAN	C	No		EO	QR		
V2431	E-6	1	C	2.000	Check	A	S/A	C	No		CV/O	CS		
V2432	D-6	1	C	2.000	Check	A	S/A	O	No		CV/PO CV/O	QR CS		
V2440	A-3	2	B	2	Check	A	S/A	C	No		CV/O	CS		

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TABLE 3
UNIT 2 VALVE TABLE
(Page 8 of 45)

P&ID: 2998-G-078 SH 122
SYSTEM: CHEMICAL AND VOLUME CONTROL (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V2433	C-6	1	C	2.000	Check	A	S/A	O	No		CV/O	QR		
V2435	C-6	1	C	2.000	Check	A	S/A	C	No		CV/O	QR		
V2462	B-5	2	C	2.000	Check	A	S/A	O	No		CV/O	QR		
V2515	G-7	1	B	2.000	Globe	A	DO	O	Yes	FC	EC FS PI	CS CS 2Y		
V2516	G-6	1	A	2.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
V2523	B-5	2	B	2.000	Globe	A	DO	LO	Yes	FO	EC PI	CS 2Y		
V2553	C-3	2	B	2.000	Globe	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V2554	E-3	2	B	2.000	Globe	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V2555	H-3	2	B	2.000	Globe	A	MO	O	Yes	FAI	EC PI	QR 2Y		
V2588	B-1	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
V2598	D-5	2	B	2.000	Gate	A	MO	O	Yes	FAI	PI	2Y		

/R4

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 130A
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3102	B-3	2	C	2.000	Check	A	S/A	C	No		CV/PO INSP	QR RF	VR-21 VR-21	
V3103	E-4	2	C	2.000	Check	A	S/A	C	No		CV/PO INSP	QR RF	VR-21 VR-21	
V3401	B-2	2	C	6.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF	RFJ-04 RFJ-04	
V3410	F-2	2	C	8.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF	RFJ-04 RFJ-04	
V3412	E-5	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3414	F-4	2	C	3.000	S/Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-05 RFJ-05	
V3417	B-5	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3427	B-4	2	C	3.000	S/Check	A	S/A	C	No		CV/C CV/O CV/PO	QR RF CS	 RFJ-05 RFJ-05	
V3519	B-5	2	B	2	Gate	A	MAN	C	No		EO	QR			/R4
V3522	G-4	2	C	3.000	Check	A	S/A	C	No		CV/O CV/PO	RF CS	RFJ-09 RFJ-09	
V3523	G-7	2	B	3.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
V3540	C-7	2	B	3.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
V3547	C-4	2	C	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO	RF RF CS	RFJ-09 RFJ-09 RFJ-09		/R4
V3550	C-6	2	B	3.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
V3551	G-6	2	B	3.000	Globe	A	MO	LC	Yes	FAI	EC EO PI	QR QR 2Y		
V3570	E-6	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		

TABLE 3
UNIT 2 VALVE TABLE
(Page 10 of 45)

P&ID: 2998-G-078 SH 130A
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3654	F-4	2	B	6.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3656	B-4	2	B	6.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		

P&ID: 2998-G-078 SH 130B
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-3301	F-5	2	B	10.000	Butterfly	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
FCV-3306	E-5	2	B	10.000	Butterfly	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
HCV-3512	F-6	2	B	10.000	Butterfly	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
HCV-3657	E-5	2	B	10.000	Butterfly	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
SE-03-2A	B-7	2	A	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
SE-03-2B	C-7	2	A	2.000	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
SR-07-1A	E-1	2	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-07-1B	G-1	2	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V07000	E-1	2	C	14.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-06 RFJ-06	

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 130B
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V07001	F-1	2	C	14.000	Check	A	S/A	C	No		CV/O CV/PO	RF QR	RFJ-06 RFJ-06	
V3101	B-6	3	C	2.000	Check	A	S/A	C	No		CV/O	CS		
V3104	F-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/PO CV/O	QR QR RF	 RFJ-07 RFJ-07	
V3105	F-3	2	C	2.000	Check	A	S/A	C	No		CV/C CV/PO CV/O	QR QR RF	 RFJ-07 RFJ-07	
V3106	E-4	2	C	10.000	Check	A	S/A	C	No		CV/O CV/PO	CS QR		
V3107	F-4	2	C	10.000	Check	A	S/A	C	No		CV/O CV/PO	CS QR		
V3201	B-6	3	B	2.000	Globe	A	MAN	C	No	FAI	EE	QR		
V3205	E-3	2	B	2	Globe	A	MAN	O	No	FAI	EC	QR		/R4
V3407	B-6	3	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
V3430	C-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3431	A-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3432	F-1	2	B	14.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3439	D-7	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3444	E-1	2	B	14.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3456	C-5	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3457	D-6	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3463	B-6	2	A	2.000	Gate	A	MAN	LC	No		EE SLT-1	QR CI		
V3466	A-7	3	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V3495	B-4	2	B	6.000	Globe	A	SO	LO	Yes	FC	EC FS PI	QR QR 2Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 130B
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3496	B-3	2	B	6.000	Globe	A	SO	LO	Yes	FC	EC FS PI	QR QR 2Y		
V3507	F-7	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V3513	C-6	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
V3517	B-2	2	B	2.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3658	D-2	2	B	12.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3659	C-4	2	B	3.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3660	C-3	2	B	3.000	Gate	A	MO	LO	Yes	FAI	EC PI	QR 2Y		
V3661	B-7	3	B	1.000	Gate	P	DO	C	Yes	FC	PI	2Y		
V3676	F-3	2	B	2	Globe	A	MAN	O	No	FAI	EC	QR			/R4
V3688	C-5	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		

P&ID: 2998-G-078 SH 131
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-3615	A-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3616	B-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3617	B-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3625	C-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3626	D-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 131

SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-3627	D-3	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3635	E-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3636	F-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3637	F-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3645	G-2	2	B	6.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3646	H-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
HCV-3647	H-2	2	B	2.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
V3113	B-3	2	C	2.000	Check	A	S/A	C	No		CV/O CV/PO	RF SP	RFJ-08 RFJ-08	
V3114	A-3	2	C	6.000	Check	A	S/A	C	No		CV/C CV/O	CS CS		
V3124	C-3	2	C	6.000	Check	A	S/A	C	No		CV/C CV/O	CS CS		
V3133	F-3	2	C	2.000	Check	A	S/A	C	No		CV/O CV/PO	RF SP	RFJ-08 RFJ-08	
V3134	E-3	2	C	6.000	Check	A	S/A	C	No		CV/C CV/O	CS CS		
V3143	H-3	2	C	2.000	Check	A	S/A	C	No		CV/O CV/PO	RF SP	RFJ-08 RFJ-08	
V3144	G-3	2	C	6.000	Check	A	S/A	C	No		CV/C CV/O	CS CS		
V3468	D-2	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 131
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3469	D-6	1	C	0.750	Relief	A	S/A	C	No		SRV	5Y		
V3480	D-7	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3481	D-6	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EO EC PI SLT-2	CS CS 2Y 2Y		
V3482	D-6	1	C	0.750	Relief	A	S/A	C	No		SRV	5Y		
V3483	D-2	2	C	2.000	Relief	A	S/A	C	No		SRV	10Y		
V3524	B-5	1	AC	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF CS 2Y	VR-04 RFJ-10 RFJ-10	
V3525	B-6	1	AC	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF CS 2Y	VR-04 RFJ-10 RFJ-10	
V3526	G-5	1	AC	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF CS 2Y	VR-04 RFJ-10 RFJ-10	
V3527	G-6	1	AC	3.000	Check	A	S/A	C	No		CV/C CV/O CV/PO SLT-2	SP RF CS 2Y	VR-04 RFJ-10 RFJ-10	
V3536	D-2	2	B	4.000	Globe	A	MO	LC	Yes	FAI	EC PI	QR 2Y		
V3539	F-2	2	B	4.000	Globe	A	MO	LC	Yes	FAI	EC PI	QR 2Y		
V3545	D-6	1	B	10.000	Gate	P	MO	LO	Yes	FAI	PI	2Y		
V3571	G-6	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 131
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3572	C-6	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3651	E-5	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3652	E-7	1	A	10.000	Gate	A	MO	LC	Yes	FAI	EC EO PI SLT-2	CS CS 2Y 2Y		
V3664	D-3	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3665	E-4	2	B	10.000	Gate	A	MO	LC	Yes	FAI	EO PI	QR 2Y		
V3666	D-4	2	C	6.000	Relief	A	S/A	C	No		SRV	10Y		
V3667	D-4	2	C	6.000	Relief	A	S/A	C	No		SRV	10Y		
V3766	C-3	2	C	2.000	Check	A	S/A	C	No		CV/O CV/PO	RF SP	RFJ-08 RFJ-08	

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 132
SYSTEM: SAFETY INJECTION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-3618	D-5	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3628	D-2	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3638	H-2	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
HCV-3648	H-5	1	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
SE-03-1A	C-3	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-03-1B	C-6	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-03-1C	G-3	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-03-1D	G-6	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
V03002	C-5	3	C	1.000	Check	A	S/A	C	No		CV/O	CS		
V03003	G-2	3	C	1.000	Check	A	S/A	C	No		CV/O	CS		
V03004	C-2	3	C	1.000	Check	A	S/A	C	No		CV/O	CS		
V03005	G-5	3	C	1.000	Check	A	S/A	C	No		CV/O	CS		
V3211	A-6	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 132
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3215	C-6	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3217	D-7	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3221	A-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V3225	C-3	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3227	D-4	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3231	E-3	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V3235	G-3	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	
V3237	H-4	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3241	E-6	2	C	1.500	Relief	A	S/A	C	No		SRV	10Y		
V3245	G-6	2	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-05 VR-05	

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-078 SH 132
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3247	H-7	1	AC	12.000	Check	A	S/A	C	No		CV/C CV/PO CV/O SLT-2	SP CS RF 2Y	VR-04 VR-06 VR-06	
V3258	D-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3259	D-6	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3260	H-3	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3261	H-6	1	AC	6.000	Check	A	S/A	C	No		CV/C CV/O SLT-2	SP CS 2Y	VR-04	
V3611	C-6	2	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3614	C-6	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3621	C-3	2	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3624	C-3	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3631	G-3	2	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3634	G-3	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 132
SYSTEM: SAFETY INJECTION (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V3641	G-6	2	B	1.000	Globe	A	DO	C	Yes	FC	EC FS PI	QR QR 2Y		
V3644	G-6	1	B	12.000	Gate	A	MO	LO	Yes	FAI	EC PI	CS 2Y		
V3733	B-5	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3734	B-5	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3735	B-2	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3736	B-2	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3737	E-2	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3738	F-2	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3739	E-5	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		
V3740	F-5	2	B	1.000	Globe	A	SO	C	Yes	FC	EC EO FS PI	CS CS CS 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 153
SYSTEM: SAMPLING

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-05-1A	B-2	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
SE-05-1B	C-2	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
SE-05-1C	E-2	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
SE-05-1D	G-2	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
SE-05-1E	B-4	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5200	C-3	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5201	D-3	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5202	F-3	2	A	0.375	Globe	A	SO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 153
SYSTEM: SAMPLING (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V5203	C-4	2	A	0.375	Globe	A	AO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5204	D-4	2	A	0.375	Globe	A	AO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V5205	F-4	2	A	0.375	Globe	A	AO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

P&ID: 2998-G-078 SH 160A
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V6341	C-3	2	A	3.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6342	G-4	2	A	3.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-078 SH 163A
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V6718	B-3	2	A	1.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6750	B-3	2	A	1.000	Diaph	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		

P&ID: 2998-G-078 SH 163B
SYSTEM: WASTE MANAGEMENT

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
¶1 V6741	D-4	2	A	1.000	Globe	A	AO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V6792	D-3	2	AC	1.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-25	

/R4

P&ID: 2998-G-079 SH 1
SYSTEM: MAIN STEAM

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-08-1A	C-6	2	B	34.000	Globe	A	PO	O	Yes	FC	EC FS PI	CS CS 2Y		
HCV-08-1B	E-6	2	B	34.000	Globe	A	PO	O	Yes	FC	EC FS PI	CS CS 2Y		
MV-08-12	G-4	2	B	4.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-13	G-4	2	B	4.000	Gate	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-079 SH 1
SYSTEM: MAIN STEAM (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-08-14	B-4	2	B	8.000	Gate	P	MO	LO	Yes	FAI	EC PI	QR 2Y		
MV-08-15	B-4	2	B	8.000	Gate	P	MO	LO	Yes	FAI	EC PI	QR 2Y		
MV-08-16	E-4	2	B	8.000	Gate	P	MO	LO	Yes	FAI	EC PI	QR 2Y		
MV-08-17	E-4	2	B	8.000	Gate	P	MO	LO	Yes	FAI	EC PI	QR 2Y		
MV-08-18A	A-4	2	B	10.000	Angle	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-18B	D-4	2	B	10.000	Angle	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-19A	A-4	2	B	10.000	Angle	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-19B	D-4	2	B	10.000	Angle	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-08-1A	C-6	2	B	3.000	Globe	A	MO	C	Yes	FAI	EC PI	CS 2Y		
MV-08-1B	E-6	2	B	3.000	Globe	A	MO	C	Yes	FAI	EC PI	CS 2Y		
MV-08-3	G-6	2	B	4.000	Globe	A	MO	LO	Yes	FAI	EO PI	QR 2Y		
SE-08-1	H-4	2	B	0.750	Globe	A	SO	O	Yes	FO	EC PI	QR 2Y		
SE-08-2	H-4	2	B	0.750	Globe	A	SO	O	Yes	FO	EC PI	QR 2Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-079 SH 1
SYSTEM: MAIN STEAM (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks	
V08130	G-4	2	C	4.000	Check	A	S/A	O	No		CV/C CV/O CV/PO	INSP CS QR	VR-08		/R4
V08163	G-4	3	C	4.000	Check	A	S/A	O	No		CV/C CV/O CV/PO	INSP CS QR	VR-08		/R4
V8201	B-5	2	C	6.000	Safety	A	S/A	O	No		SRV	5Y			
V8202	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8203	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8204	B-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8205	E-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8206	D-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8207	E-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8208	D-5	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8209	B-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8210	B-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8211	B-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8212	B-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8213	E-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8214	D-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8215	E-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			
V8216	D-6	2	C	6.000	Safety	A	S/A	C	No		SRV	5Y			

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-1014
SYSTEM: MSIV PNEUMATIC CONTROL SYSTEM

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V2A	C-7	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V2B	C-7	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V3A	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V3B	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V4A	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V4B	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V5A	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V5B	C-6	NC	B	1.000	3WY	A	AO	O	No	FC	EC FS	CS CS		
V19A	B-7	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
V19B	B-7	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
V20A	B-5	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		
V20B	B-5	NC	B	1.000	3WY	A	SO	O	No	FO	EC	CS		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-080 SH 2A
SYSTEM: FEEDWATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-09-1A	B-5	2	B	20.000	Gate	A	HYD	O	Yes	FAI	EC PI	CS 2Y		
HCV-09-1B	B-5	2	B	20.000	Gate	A	HYD	O	Yes	FAI	EC PI	CS 2Y		
HCV-09-2A	C-5	2	B	20.000	Gate	A	HYD	O	Yes	FAI	EC PI	CS 2Y		
HCV-09-2B	C-5	2	B	20.000	Gate	A	HYD	O	Yes	FAI	EC PI	CS 2Y		
V09252	B-7	2	C	18.000	Check	A	S/A	O	No		CV/O	QR		
V09294	C-7	2	C	18.000	Check	A	S/A	O	No		CV/O	QR		
CHKVLV-1A	NA	NC	C	0.500	Check	A	S/A	C	No		CV/C	CS		Oper. Sys Air Supply
CHKVLV-1B	NA	NC	C	0.500	Check	A	S/A	C	No		CV/C	CS		Oper. Sys Air Supply
CHKVLV-2A	NA	NC	C	0.500	Check	A	S/A	C	No		CV/C	CS		Oper. Sys Air Supply
CHKVLV-2B	NA	NC	C	0.500	Check	A	S/A	C	No		CV/C	CS		Oper. Sys Air Supply

P&ID: 2998-G-080 SH 2B
SYSTEM: FEEDWATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V09107	B-4	3	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09119	B-6	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09120	B-7	2	B	4.000	Gate	A	MAN	LO	No	FAI	EE	QR		
V09123	D-4	3	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09135	D-6	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09136	D-7	2	B	4.000	Gate	A	MAN	LO	No	FAI	EE	QR		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-080 SH 2B
SYSTEM: FEEDWATER (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V09139	F-4	3	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09151	F-6	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09152	F-7	2	B	4.000	Gate	A	MAN	LO	No	FAI	EE	QR		
V09157	G-6	2	C	4.000	Check	A	S/A	C	No		CV/O	CS		
V09158	G-7	2	B	4.000	Gate	A	MAN	LO	No	FAI	EE	QR		
V09303	G-3	3	C	2.000	Check	A	S/A	C	No		CV/PO CV/PO INSP	QR SP RF	VR-11 VR-11 VR-11	
V09304	E-3	3	C	1.500	Check	A	S/A	C	No		CV/PO CV/PO INSP	QR SP RF	VR-11 VR-11 VR-11	
V09305	C-3	3	C	1.500	Check	A	S/A	C	No		CV/PO CV/PO INSP	QR SP RF	VR-11 VR-11 VR-11	
V09724	A-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09725	E-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09726	H-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
V09727	H-6	3	C	0.375	Check	A	S/A	C	No		CV/C	RF	RFJ-23	
MV-09-09	B-6	2	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-10	D-6	2	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-11	F-6	2	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-09-12	G-6	2	B	4.000	Globe	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
SE-09-2	B-5	3	B	4.000	Gate	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-09-3	D-5	3	B	4.000	Gate	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-080 SH 2B
SYSTEM: FEEDWATER (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-09-4	F-5	3	B	4.000	Gate	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
SE-09-5	G-5	3	B	4.000	Gate	A	SO	C	Yes	FC	EC EO FS PI	QR QR QR 2Y		
V12801	A-2	3	B	8.000	Gate	A	MAN	LC	No	FAI	EE	QR		
V12802	A-2	3	B	8.000	Gate	A	MAN	LC	No	FAI	EE	CS		
V12803	A-2	3	B	8.000	Gate	A	MAN	LC	No	FAI	EE	CS		
V12805	A-3	4	B	8.000	Gate	A	MAN	LC	No	FAI	EE	QR		
V12806	A-3	4	C	8.000	Check	A	S/A	C	No		CV/O	RF*	RFJ-12	

* Note: This refers to Unit 1 refueling only, **not** Unit 2.

P&ID: 2998-G-082 SH 2
SYSTEM: INTAKE COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-21-2	F-4	3	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-21-3	G-4	3	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
SR21196	B-5	3	C	3.000	Relief	A	S/A	C	No		SRV	10Y		
SR21243	B-6	3	C	3.000	Relief	A	S/A	C	No		SRV	10Y		
TCV-14-4A	A-5	3	B	30.000	Butterfly	A	PO	O	No	FO	EO FS	QR QR		
TCV-14-4B	A-6	3	B	30.000	Butterfly	A	PO	O	No	FO	EO FS	QR QR		
V21162	G-5	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21205	G-6	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21208	G-7	3	C	30.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V21402	D-5	3	C	2.000	Check	A	S/A	O	No		CV/O	QR		
V21403	D-6	3	C	2.000	Check	A	S/A	O	No		CV/O	QR		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-083 SH 1
SYSTEM: COMPONENT COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-14-3A	H-1	3	B	14.000	Butterfly	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		
HCV-14-3B	H-2	3	B	14.000	Butterfly	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		
HCV-14-8A	E-5	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
HCV-14-8B	E-5	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
HCV-14-9	F-6	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
HCV-14-10	F-6	3	B	16.000	Butterfly	A	PO	O	Yes	FC	EC FS PI	QR QR 2Y		
MV-14-1	D-6	3	B	24	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-2	D-7	3	B	24	Butterfly	P	MO	LC	Yes	FAI	PI	2Y		
MV-14-3	F-6	3	B	24	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-4	F-6	3	B	24	Butterfly	P	MO	LC	Yes	FAI	PI	2Y		
MV-14-9	B-3	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-10	B-2	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-11	B-4	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-12	B-3	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-13	B-1	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-14	B-1	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-15	B-2	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-16	B-2	2	B	8.000	Butterfly	P	MO	LO	Yes	FAI	PI	2Y		
MV-14-17	E-4	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-14-18	E-4	3	B	12.000	Butterfly	A	MO	LC	Yes	FAI	EC PI	QR 2Y		
SR14307	A-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		

/R4

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-083 SH 1
SYSTEM: COMPONENT COOLING WATER (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SR14318	A-3	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR14329	A-1	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR14342	A-2	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
V14143	D-6	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V14147	D-7	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
V14151	D-6	3	C	20.000	Check	A	S/A	O	No		CV/C CV/O	QR QR		
SR14350	G-1	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR14359	G-2	3	C	1.000	Relief	A	S/A	C	No		SRV	10Y		

P&ID: 2998-G-083 SH 2
SYSTEM: COMPONENT COOLING WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-14-1	D-6	2	A	8.000	Butterfly	A	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-2	C-1	2	A	8.000	Butterfly	A	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-6	D-2	2	A	8.000	Butterfly	P	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
HCV-14-7	D-6	2	A	8.000	Butterfly	P	PO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
SR-14636	D-6	2	AC	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		
SR-14637	D-2	2	AC	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-084 SH 1
SYSTEM: MAKE-UP WATER

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-15-1	D-6	2	A	2.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V15328	D-5	2	AC	2.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-14	
SR-15925	D-5	NC	C	0.750	Relief	A	S/A	C	No		SRV	10Y		

P&ID: 2998-G-085 SH 1
SYSTEM: SERVICE AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-18-2	F-6	2	A	2.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
SH-18797	F-3	2	A	1.000	Ball	P	MAN	LC	No		SLT-1	CI		
V181270	E-5	2	AC	2.000	Check	P	S/A	C	No		SLT-1	CI		

P&ID: 2998-G-085 SH 2A
SYSTEM: INSTRUMENT AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SR-18-6A	D-2	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
SR-18-6B	D-1	2	C	0.500	Relief	A	S/A	C	No		SRV	10Y		
V18195	E-6	2	AC	2.000	Check	A	S/A	C	No		CV/C SLT-1	RF CI	RFJ-15	
V18279	B-2	2	C	0.500	Check	A	S/A	C	No		CV/C	CS		
V18283	A-3	2	C	0.500	Check	A	S/A	C	No		CV/C	CS		
V18290	G-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18291	G-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18294	H-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	
V18295	H-2	2	C	0.750	Check	A	S/A	C	No		CV/C	CS	VR-12	

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 8770-G-085 SH 2C
SYSTEM: INSTRUMENT AIR

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
HCV-18-1	G-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		

P&ID: 2998-G-086 SH 1
SYSTEM: MISCELLANEOUS

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-23-3	C-6	2	B	3.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-5	C-6	2	B	3.000	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-7	C-7	2	B	0.500	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
FCV-23-9	C-7	2	B	0.500	Globe	A	DO	O	Yes	FC	EC FS PI	QR QR 2Y		
SR-17221	B-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-17222	C-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V17204	B-3	3**	C	1.500	Check	A	S/A	C	No		CV/PO CV/O	QR 2Y	VR-13 VR-13	
V17207	B-3	3**	B	2.000	Globe	A	MAN	C	No	FAT	EE	QR		
V17214	D-3	3**	C	1.500	Check	A	S/A	C	No		CV/PO CV/O	QR 2Y	VR-13 VR-13	
V17217	D-3	3**	B	2.000	Globe	A	MAN	C	No	FAT	EE	QR		
V17218	C-3	3**	B	2.000	Globe	A	MAN	C	No	FAT	EE	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-088 SH 1
SYSTEM: CONTAINMENT SPRAY

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
MV-07-1A	E-5	2	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-07-1B	E-5	2	B	24.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
SE-07-3A	G-3	2	B	0.500	Globe	A	SO	C	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SE-07-3B	H-3	2	B	0.500	Globe	A	SO	C	Yes	FO	EC EO FS PI	QR QR QR 2Y		
SR-07-1C	E-2	2	C	1.000	Relief	A	S/A	C	No		SRV	10Y		
SR-07-2A	F-3	2	C	0.500	Relief	A	S/A	C	No	FC	SRV	10Y		
SR-07-2B	G-3	2	C	0.500	Relief	A	S/A	C	No	FC	SRV	10Y		
V07119	E-6	2	C	24.000	Check	A	S/A	C	No		CV/C CV/C CV/PO CV/PO INSP	CS SP QR SP RF	 VR-14 VR-14 VR-14 VR-14	
V07120	E-6	2	C	24.000	Check	A	S/A	C	No		CV/C CV/C CV/PO CV/PO INSP	CS SP QR SP RF	 VR-14 VR-14 VR-14 VR-14	
V07129	H-6	2	C	12.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF	RFJ-16 RFJ-16	
V07130	H-6	2	B	12.000	Gate	A	MAN	LO	No		EE	QR		
V07143	G-6	2	C	12.000	Check	A	S/A	C	No		CV/PO CV/O	QR RF	RFJ-16 RFJ-16	
V07145	G-6	2	B	12.000	Gate	A	MAN	LO	No		EE	QR		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-088 SH 1
SYSTEM: CONTAINMENT SPRAY (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks	
V07231	E-2	2	C	2.000	Check	A	S/A	C	No		CV/O	QR			/R4
V07232	E-2	2	C	2.000	Check	A	S/A	C	No		CV/O	QR			/R4
V07256	G-3	2	C	0.500	Check	A	S/A	C	No		CV/O	RF	RFJ-18		
V07258	H-3	2	C	0.500	Check	A	S/A	C	No		CV/O	RF	RFJ-18		
V07412	F-3	2	C	0.500	Check	A	S/A	C	No		CV/O	QR			
V29431	D-2	2	B	1	Check	A	S/A	O	No		CV/C	RF	RFJ-24		/R4
V29432	D-2	2	B	1	Check	A	S/A	O	No		CV/C	RF	RFJ-24		/R4

P&ID: 2998-G-088 SH 2
SYSTEM: CONTAINMENT SPRAY

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V07170	E-3	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07172	G-2	2	C	24.000	Check	A	S/A	C	No		INSP	RF	VR-16	
V07174	G-2	2	C	24.000	Check	A	S/A	C	No		INSP	RF	VR-16	
V07188	E-4	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07189	E-4	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
V07192	C-4	2	C	10.000	Check	A	S/A	C	No		INSP	RF	VR-17	
V07193	C-4	2	C	10.000	Check	A	S/A	C	No		INSP	RF	VR-17	
V07206	E-3	2	A	3.000	Gate	P	MAN	LC	No		SLT-1	CI		
FCV-07-1A	C-3	2	B	12.000	Gate	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		
FCV-07-1B	D-3	2	B	12.000	Gate	A	DO	C	Yes	FO	EO FS PI	QR QR 2Y		

TABLE 3
UNIT 2 VALVE TABLE
(Page 35 of 45)

P&ID: 2998-G-088 SH 2
SYSTEM: CONTAINMENT SPRAY (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
LCV-07-11A	G-4	2	A	2.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
LCV-07-11B	G-3	2	A	2.000	Globe	A	DO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
MV-07-2A	G-3	2	B	24.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-07-2B	G-3	2	B	24.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
MV-07-3	C-2	2	B	12.000	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		
MV-07-4	D-2	2	B	12.000	Gate	A	MO	O	Yes	FAI	EC PI	QR 2Y		
SE-07-5A	C-6	2	B	0.375	Globe	P	SO	LO	Yes	FO	PI	2Y		
SE-07-5B	D-6	2	B	0.375	Globe	P	SO	LO	Yes	FO	PI	2Y		
SE-07-5C	D-6	2	B	0.375	Globe	P	SO	LO	Yes	FO	PI	2Y		
SE-07-5D	D-6	2	B	0.375	Globe	P	SO	LO	Yes	FO	PI	2Y		
SR-07474	G-4	2	AC	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		
SR-07475	G-4	NC	C	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		
SR-07476	E-4	2	AC	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		
SR-07477	E-4	2	AC	0.750	Relief	A	S/A	C	No		SLT-1 SRV	CI 10Y		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-091 SH 1
SYSTEM: MISCELLANEOUS

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V00101	B-5	2	A	8.000	Gate	P	MAN	LC	No		SLT-1	CI		
V00139	C-4	2	A	0.375	Globe	P	MAN	LC	No		SLT-1	CI		
V00140	D-4	2	A	1.000	Globe	P	MAN	LC	No		SLT-1	CI		
V00143	D-5	2	A	1.000	Globe	P	MAN	LC	No		SLT-1	CI		
V00144	C-5	2	A	0.375	Globe	P	MAN	LC	No		SLT-1	CI		

P&ID: 2998-G-092 SH 1
SYSTEM: MISCELLANEOUS SAMPLING

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-26-1	B-2	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-2	B-2	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-3	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-4	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-5	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-26-6	B-3	2	A	1.000	Globe	A	DO	O	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FSE-27-8	A-5	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-092 SH 1
SYSTEM: MISCELLANEOUS SAMPLING (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FSE-27-9	A-5	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-10	B-5	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-11	B-5	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-12	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-13	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-14	A-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-15	B-6	2	AC	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-16	B-6	2	AC	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		

TABLE 3
UNIT 2 VALVE TABLE
(Page 38 of 45)

P&ID: 2998-G-092 SH 1
SYSTEM: MISCELLANEOUS SAMPLING (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FSE-27-17	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FSE-27-18	B-6	2	A	0.375	Globe	A	SO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
V27101	B-6	2	AC	0.375	Check	A	S/A	C	No		CV/C CV/O SLT-1	RF QR CI	RFJ-19	
V27102	B-6	2	AC	0.375	Check	A	S/A	C	No		CV/C CV/O SLT-1	RF QR CI	RFJ-19	

P&ID: 2998-G-096 SH 1A
SYSTEM: EDG SYSTEM - DIESEL ENGINE 2A1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1A1	B-5	3**	B	1.500	Gate	A	SO	C	No	FC	EC EO FS	QR QR QR		
SR-59-1A1	C-5	3**	C	1.250	Relief	A	S/A	C	No		SRV	10Y		
V59002	B-4	3**	C	1.500	Check	A	S/A	C	No		CV/O	QR		
V59010	G-5	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59011	G-5	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59017	G-4	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59021	G-3	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59232	C-3	3**	C	0.750	Check	A	S/A	O	No		CV/C	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-096 SH 1B
SYSTEM: EDG SYSTEM - DIESEL ENGINE 2A1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1A2	H-2	3**	B	1.500	Gate	A	SO	C	No	FC	EC EO FS	QR QR QR		
SR-59-1A2	F-2	3**	C	1.250	Relief	A	S/A	C	No		SRV	10Y		
V59025	B-5	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59026	B-4	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59048	B-3	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59051	B-3	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59062	G-4	3**	C	1.500	Check	A	S/A	C	No		CV/O	QR		
V59066	F-5	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		

** Optional Classification - Relief request approval not required, provided for information only.

P&ID: 2998-G-096 SH 1C
SYSTEM: EMER. DIESEL GEN. AIR START 2A

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-59-1A1	H-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-2A1	H-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-3A1	F-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-4A1	F-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-3A	G-3	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-4A	E-3	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-5A	E-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-6A	G-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SR-59-3A	B-5	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-4A	B-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-5A	B-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-6A	B-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-096 SH 1C
SYSTEM: EMER. DIESEL GEN. AIR START 2A (continued)

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
V59156	B-5	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59158	B-3	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59159	B-2	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59183	G-2	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59187	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59191	G-4	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59192	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59193	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59197	E-4	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59198	E-5	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59199	E-5	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59236	B-4	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-096 SH 2A
SYSTEM: EMER. DIESEL GEN. 2B1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1B1	B-5	3**	B	1.500	Globe	A	S/O	C	No	FC	EC EO FS	QR QR QR		
SR-59-1B1	C-5	3**	C	1.250	Relief	A	S/A	C	No		SRV	10Y		
V59040	G-5	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59041	G-5	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59078	B-4	3**	C	1.500	Check	A	S/A	C	No		CV/O	QR		
V59089	G-3	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59213	C-3	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59219	G-4	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		

** Optional Classification - Relief request approval not required, provided for information only.

P&ID: 2998-G-096 SH 2B
SYSTEM: EMER. DIESEL GEN. 2B1

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
SE-59-1B2	H-2	3**	B	1.500	Globe	A	SO	C	No	FC	EC EO FS	QR QR QR		
SR-59-1B2	F-2	3**	C	1.250	Relief	A	S/A	C	No		SRV	10Y		
V59055	B-4	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59056	B-5	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59116	G-4	3**	C	1.500	Check	A	S/A	C	No		CV/O	QR		
V59127	B-3	3**	C	1.000	Check	A	S/A	O	No		CV/C	QR		
V59165	B-3	3**	C	1.000	Check	A	S/A	C	No		CV/O	QR		
V59194	F-5	3**	C	0.750	Check	A	S/A	O	No		CV/C	QR		

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-096 SH 2C
SYSTEM: EMER. DIESEL GEN. AIR START 2B

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-59-1B1	F-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-2B1	F-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-3B1	H-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
FCV-59-4B1	H-2	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-3B	G-3	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-4B	E-3	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-5B	G-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SE-59-6B	E-4	3**	B	1.500	Gate	A	AO	C	No	FC	EO	2Y	VR-18	
SR-59-3B	B-5	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-4B	B-4	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-5B	B-3	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
SR-59-6B	B-2	3**	C	0.750	Relief	A	S/A	C	No		SRV	10Y		
V59203	B-5	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59204	B-4	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59205	B-3	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59206	B-2	3**	C	1.250	Check	A	S/A	C	No		CV/C	QR		
V59231	G-2	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59235	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59239	G-4	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59240	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59241	E-2	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59245	E-4	3**	C	0.250	Check	A	S/A	C	No		CV/C	2Y	VR-18	
V59246	E-5	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	
V59247	E-5	3**	C	0.250	Check	A	S/A	C	No		CV/C CV/O	2Y 2Y	VR-18 VR-18	

** Optional Classification - Relief request approval not required, provided for information only.

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-878
SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-1	C-2	2	B	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI	CS CS 2Y		
FCV-25-2	C-3	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-3	C-4	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-4	C-6	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-5	C-7	2	A	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	CS CS 2Y CI		
FCV-25-6	C-8	2	B	48.000	Butterfly	A	PO	C	Yes	FC	EC FS PI	CS CS 2Y		
FCV-25-7	C-15	2	A	24.000	Butterfly	A	PO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
FCV-25-8	C-15	2	A	24.000	Butterfly	A	PO	C	Yes	FC	EC EO FS PI SLT-1	QR QR QR 2Y CI		
V-25-20	C-13	2	AC	24.000	Check	A	S/A	C	No		CV/C VBT SLT-1	CS CS CI	VR-19 VR-19	
V-25-21	C-13	2	AC	24.000	Check	A	S/A	C	No		CV/C VBT SLT-1	CS CS CI	VR-19 VR-19	

TABLE 3
UNIT 2 VALVE TABLE
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P&ID: 2998-G-879 SH2
SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-14	E-6	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-15	E-7	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-16	E-5	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-17	E-8	3	B	12.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-18	C-17	3	B	6.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-19	C-17	3	B	6.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-24	A-17	3	B	10.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		
FCV-25-25	A-17	3	B	10.000	Butterfly	A	MO	O	Yes	FAI	EC PI	QR 2Y		

P&ID: 2998-G-879 SH 3
SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-11	H-4	2	B	16.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-12	J-4	2	B	16.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-13	I-14	2	B	12.000	Butterfly	A	MO	C	Yes	FAI	EO PI	QR 2Y		

TABLE 3

UNIT 2 VALVE TABLE

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P&ID: 2998-G-879 SH 3
SYSTEM: HEATING, VENTILATION AND AIR CONDITION

Valve Number	Coord.	CL	Cat.	Size	Type	A/P	Act. Type	Norm Pos.	Rem Ind	Fail Mode	Exam	Test Freq	Relief Req.	Remarks
FCV-25-20	M-1	2	A	8.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-25-21	M-2	2	A	8.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-25-26	N-2	2	A	8.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
FCV-25-29	K-3	2	B	4.000	Butterfly	A	MO	C	Yes	FAI	EC PI	QR 2Y		
FCV-25-30	H-4	2	B	20.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-31	J-4	2	B	20.000	Butterfly	A	MO	C	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-32	H-4	2	B	30.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-33	J-4	2	B	30.000	Butterfly	A	MO	O	Yes	FAI	EC EO PI	QR QR 2Y		
FCV-25-34	H-2	2	B	4.000	Butterfly	A	MO	C	Yes	FAI	EC PI	QR 2Y		
FCV-25-36	N-1	2	A	8.000	Butterfly	A	PO	C	Yes	FC	EC FS PI SLT-1	QR QR 2Y CI		
V-25-23	J-4	2	C	24.000	Check	A	S/A	C	No		CV/O	QR		
V-25-24	H-4	2	C	24.000	Check	A	S/A	C	No		CV/O	QR		

END OF TABLE 3

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RELIEF REQUEST NO. PR-02

COMPONENTS

Auxiliary Feedwater (AFW) Pumps 1A through 1C (8770-G-080, Sh 3)
Auxiliary Feedwater (AFW) Pumps 2A through 2C (2998-G-080, Sh 2B)

PART 6 REQUIREMENT

Where system resistance can not be varied, flowrate and pressure shall be determined and compared to their respective reference value. (Part 6, Para. 5.2(c)).

BASIS FOR RELIEF

There are only two practical flowpaths available for performing inservice testing of the AFW Pumps. These include the primary flowpath from the Condensate Storage Tank (CST) to the main feed supply lines and thence to the steam generators and the minimum-flow recirculation (mini-recirc and bypass test loop) which recirculates back to the CST. The former is provided with flowrate measuring instrumentation; however, the mini-recirc line is a fixed resistance circuit with no flow instrumentation.

Full or substantial flow testing of these pumps is not practical during plant operation for several reasons. During auxiliary feedwater injection via the main feedwater lines while the plant is operating at power, a large temperature differential (approximately 375°F) could exist between the CST water and the normal steam generator makeup flowstream that would result in a significant thermal shock and fatigue cycling of the feedwater piping and steam generator nozzles. In addition, based on the expected duration of the testing and the flowrate of the pumps (325-600 gpm), it is expected that the cooldown of the steam generators would induce cooldown and contraction of the reactor coolant system resulting in potential undesirable reactivity variations and power fluctuations. Thus, during quarterly testing of the AFW pumps, flow is routed through the minimum flow recirculation line returning condensate to the Condensate Storage Tank. This recirculation flowpath is capable of passing a flowrate somewhat less than 20 percent of that at the pump design operating point. No flow instrumentation is installed in this recirculation piping and, furthermore, hydraulic pump test data at or near a pumps' shutoff head provides little information as to the mechanical condition of a pump.

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RELIEF REQUEST NO. PR-02
(continued)

BASIS FOR RELIEF (continued)

These pumps are standby pumps and little degradation is expected with respect to hydraulic performance during plant power operations when the pumps remain idle. Thus, the alternate testing will provide adequate monitoring of these pumps with respect to the applicable Code requirements to ensure continued operability and availability for accident mitigation.

NRC Generic Letter 89-04, Position 9, allows elimination of minimum flow test line flowrate measurements providing inservice tests are performed during cold shutdowns or refueling periods under full or substantial flow conditions where pump flowrate is recorded and evaluated. The proposed alternate testing is consistent with this philosophy and the intent of this position.

ALTERNATE TESTING

During quarterly testing of the AFW pumps, the fixed-resistance mini-flow test circuit will be used and pump differential pressure and vibration will be measured and compared to their respective reference values per Paragraph 5.2(c).

During testing performed at cold shutdown, pump differential pressure, flowrate and vibration will be recorded and evaluated per Paragraph 5.2(b).

Testing during cold shutdowns will be on a frequency determined by intervals between shutdowns as follows:

- For cold shutdown periods occurring at intervals of 3 months or longer - each shutdown
- For cold shutdown periods occurring at intervals of less than 3 months - testing is not required unless 3 months have passed since the last cold shutdown test.

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RELIEF REQUEST NO. PR-02
(continued)

ALTERNATE TESTING (continued)

Cold shutdown pump and valve testing will normally commence within 48 hours of entering cold shutdown and continue until testing of all pumps and valves designated for cold shutdown testing during the outage is complete or the unit is ready to return to power. For extended outages, testing need not commence within 48 hours provided all testing of components requiring tests is completed prior to startup. If, for any reason, testing is not started within 48 hours of achieving cold shutdown, then all components requiring tests will be tested accordingly. For those cases where pumps can be tested during power ascension and where the Technical Specification requirements for the pumps or system determine when the pump is required to be operable, tests may be performed during power ascension without regard to the foregoing. Where plant conditions or other circumstances arise that preclude testing of a pump and testing of other pumps or valves is commenced within 48 hours of achieving cold shutdown, the unit need not be retained in cold shutdown for the sole purpose of completing testing.

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RELIEF REQUEST NO. PR-03

COMPONENTS

Boric Acid Makeup (BAM) Pumps 1A and 1B (8770-G-078, Sh 121B)
Boric Acid Makeup (BAM) Pumps 2A and 2B (2998-G-078, Sh 121B)

PART 6 REQUIREMENT

An inservice test shall be conducted with the pump operating at specified test reference conditions. The test parameters shown in Table 2 shall be determined and recorded as directed in this paragraph. (Paragraph 5.2)

Pressure, flowrate and vibration (displacement or velocity) shall be determined and compared with corresponding reference values. (Paragraph 5.2(d))

BASIS FOR RELIEF

There are three available flowpaths for performing inservice testing of the BAM pumps. These include the primary flow path to the charging pump suction header, a recirculation line leading back to the Refueling Water Tank (RWT), and the BAM tank recirculation line. None of these flow paths is acceptable with respect to Code compliance for the following reasons:

1. Operating the BAM pumps discharging into the charging pump suction header requires the introduction of highly concentrated boric acid solution from the boric acid makeup tanks to the suction of the charging pumps. This would result in the addition of excess boron to the RCS. This rapid insertion of negative reactivity would result in RCS cooldown and de-pressurization. A large enough boron addition could result in an unscheduled plant trip and a possible safety injection system initiation. During cold shutdown, the introduction of excess quantities of boric acid into the RCS via this flowpath is undesirable from the aspect of maintaining proper plant chemistry and the inherent difficulties that may be encountered during the subsequent startup due to over-boration of the RCS. In addition, the waste management system would be overburdened by the large amounts of RCS coolant that would require processing to reduce boron concentration.

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RELIEF REQUEST NO. PR-03
(continued)

BASIS FOR RELIEF (continued)

2. The second circuit recirculates water to the Refueling Water Tank (RWT) or the Volume Control Tank (VCT). During normal plant power operation it is undesirable to pump to the RWT and deplete the BAM tank inventory. One of the two BAM tanks must be maintained at the Technical Specification level while the other is used as required for plant operation and boron shim. The Tech Spec limits provide only a narrow acceptable band (100-200 gallons), thus even a small reduction in tank inventory would be unacceptable. Also, the operational BAM tanks' level typically varies from test to test by as much as 15 to 20 feet. This variance in pump suction pressure will have a direct effect on pump head and flow such that test repeatability would be questionable.

3. The BAM tank recirculation flowpaths are fixed resistance circuits (one-inch NPS pipe) containing a flow limiting orifice. There is no flowrate measuring instrumentation installed in these lines. Pumping boric acid from tank to tank could be possible but flowrates would be small restricting pump operation to the high head portion of the pump curve. Also, as described above, one of the two BAM tanks must be maintained at Technical Specification level and the Technical Specification limits provide only a narrow acceptable band (100-200 gallons), thus a small reduction in tank inventory is unacceptable. The other BAM tanks' level will vary from test to test by as much as 15 to 20 feet. Similarly, this variance in pump suction pressure will have a direct effect on pump head and flow such that test repeatability would be questionable.

NRC Generic Letter 89-04, Position 9, allows elimination of minimum flow test line flowrate measurements providing inservice tests are performed during cold shutdowns or refueling periods under full or substantial flow conditions where pump flowrate is recorded and evaluated. The proposed alternate testing is consistent with this philosophy and the intent of Position 9.

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RELIEF REQUEST NO. PR-03

(continued)

ALTERNATE TESTING

During quarterly testing of the BAM pumps, the fixed-resistance BAM tank recirculation line will be used. Pump differential pressure and vibration will be measured and compared to their respective reference values per Paragraph 5.2(c).

During testing performed at refueling, pump differential pressure, flowrate and vibration will be recorded and evaluated per Paragraph 5.2(b).

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RELIEF REQUEST NO. PR-04

COMPONENTS

Containment Spray (CS) Pumps 1A and 1B (8770-G-088, Sh 1)
Containment Spray (CS) Pumps 2A and 2B (2998-G-088, Sh 1)

PART 6 REQUIREMENT

Where system resistance can not be varied, flowrate and pressure shall be determined and compared to their respective reference value.
(Part 6, Para. 5.2(c))

BASIS FOR RELIEF

There are two practical flowpaths available for performing inservice testing of the containment spray pumps. These include one that directs borated water from the RWT to the RCS via the low-pressure injection header. The other is minimum-flow recirculation (mini-recirc and bypass test loop) which recirculates to the Refueling Water Tank (RWT).

The first would require modifying the shutdown cooling lineup while in cold shutdown; however, even then the shutdown cooling system can not provide sufficient letdown flow to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function. Thus, the only practical opportunity for testing these pumps via this flowpath is during refueling outages when water from the RWT is used to fill the refueling cavity.

The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow limiting orifice with no flowrate measuring instrumentation installed. Furthermore, hydraulic pump test data at or near a pumps' shutoff head provides little information as to the mechanical condition of a pump.

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RELIEF REQUEST NO. PR-04
(continued)

BASIS FOR RELIEF (continued)

These pumps are standby pumps that remain idle during most plant operations except for testing periods, thus, service-related degradation with respect to hydraulic performance between testing periods is unlikely. Consequently, the alternate testing will provide adequate monitoring of these pumps with respect to the applicable Code requirements to ensure continued operability and availability for accident mitigation.

NRC Generic Letter 89-04, Position 9, allows elimination of minimum flow test line flowrate measurements providing inservice tests are performed during cold shutdowns or refueling under full or substantial flow conditions where pump flowrate is recorded and evaluated. The proposed alternate testing is consistent with this philosophy and the intent of this position.

ALTERNATE TESTING

During quarterly testing of the containment spray pumps, the fixed-resistance mini-flow test circuit will be used and pump differential pressure and vibration will be measured and compared to their respective reference values per Paragraph 5.2(c).

During testing performed during reactor refueling, pump differential pressure, flowrate and vibration will be recorded and evaluated per Part 6, Para. 5.2(b).

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RELIEF REQUEST NO. PR-05

COMPONENTS

High Pressure Safety Injection (HPSI) Pumps 1A and 1B (8770-G-078, Sh 130A)
High Pressure Safety Injection (HPSI) Pumps 2A and 2B (2998-G-078, Sh 130A)

PART 6 REQUIREMENT

Where system resistance can not be varied, flowrate and pressure shall be determined and compared to their respective reference value.
(Part 6, Para. 5.2(c))

BASIS FOR RELIEF

During quarterly testing of the HPSI pumps, the pumps can not develop sufficient discharge pressure to overcome reactor coolant system (RCS) pressure and allow flow through the safety injection headers. Thus, during quarterly testing of the HPSI pumps, flow is routed through a minimum flow recirculation line returning boric acid solution to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow limiting orifice capable of passing a flowrate somewhat less than 10 percent of that at the pump design operating point with no flowrate measuring instrumentation installed. Note that hydraulic pump test data at or near a pumps' shutoff head provides little information as to the mechanical condition of a pump.

During cold shutdown conditions, full flow operation of the HPSI pumps to the RCS is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits specified in the Technical Specifications (LTOP).

These pumps are standby pumps and little degradation is expected with respect to hydraulic performance during operational periods when the pumps are idle. Thus, the alternate testing will provide adequate monitoring of these pumps with respect to the applicable Code requirements to ensure continued operability and availability for accident mitigation.

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RELIEF REQUEST NO. PR-05
(continued)

BASIS FOR RELIEF (continued)

NRC Generic Letter 89-04, Position 9, allows elimination of minimum flow test line flowrate measurements provided that inservice tests are performed during cold shutdowns or refueling periods under full or substantial flow conditions where pump flowrate is recorded and evaluated. The proposed alternate testing is consistent with this philosophy and the intent of this position.

ALTERNATE TESTING

During quarterly testing of the HPSI pumps, the fixed-resistance (mini-flow) test circuit will be used and pump differential pressure and vibration will be measured. Pump differential pressure and vibration measurements will be compared to their respective reference values per Paragraph 5.2(c).

During testing performed during reactor refueling, pump differential pressure, flowrate and vibration will be recorded and evaluated per Part 6, Paragraph 5.2(b).

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REQUEST NO. PR-06

COMPONENTS

Low Pressure Safety Injection (LPSI) Pumps 1A and 1B (8770-G-078, Sh 130B)
Low Pressure Safety Injection (LPSI) Pumps 2A and 2B (2998-G-078, Sh 130B)

PART 6 REQUIREMENT

Where system resistance can not be varied, flowrate and pressure shall be determined and compared to their respective reference value.
(Part 6, Para. 5.2(c))

BASIS FOR RELIEF

During quarterly testing of the LPSI pumps, the pumps can not develop sufficient discharge pressure to overcome reactor coolant system (RCS) pressure and allow flow through the safety injection headers. Thus, during quarterly testing of the LPSI pumps, flow is routed through a minimum flow recirculation line returning boric acid solution to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow limiting orifice capable of passing a flowrate somewhat less than 10 percent of that at the pump design operating point with no flowrate measuring instrumentation installed. Note that hydraulic pump test data at or near a pumps' shutoff head provides little information as to the mechanical condition of a pump.

Except for brief periods when these pumps are used for shutdown cooling, they are standby pumps and little degradation is expected with respect to hydraulic performance during operational periods when the pumps remain idle. Thus, the alternate testing will provide adequate monitoring of these pumps with respect to the applicable Code requirements to ensure continued operability and availability for accident mitigation.

NRC Generic Letter 89-04, Position 9, allows elimination of minimum flow test line flowrate measurements providing inservice tests are performed during cold shutdowns or refueling under full or substantial flow conditions where pump flowrate is recorded and evaluated. The proposed alternate testing is consistent with this philosophy and the intent of this position.

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RELIEF REQUEST NO. PR-06
(continued)

ALTERNATE TESTING

During quarterly testing of the LPSI pumps, the fixed-resistance mini-flow test circuit will be used and pump differential pressure and vibration will be measured. Pump differential pressure and vibration measurements taken during this testing will be compared to their respective reference values per Part 6, Para. 5.2(c).

During testing performed at cold shutdown and refueling, pump differential pressure, flowrate and vibration will be recorded and evaluated per Part 6, Paragraph 5.2(b).

Testing during cold shutdowns will be on a frequency determined by intervals between shutdowns as follows:

For cold shutdown periods occurring at intervals of 3 months or longer - each shutdown.

For cold shutdown periods occurring at intervals of less than 3 months - testing is not required unless 3 months have passed since the last cold shutdown test.

Cold shutdown pump and valve testing will normally commence within 48 hours of entering cold shutdown and continue until testing of all pumps and valves designated for cold shutdown testing during the outage is complete or the unit is ready to return to power. For extended outages, testing need not commence within 48 hours provided all testing of components requiring tests is completed prior to startup. If, for any reason, testing is not started within 48 hours of achieving cold shutdown, then all components requiring tests will be tested accordingly. For those cases where pumps can be tested during power ascension and where the Technical Specification requirements for the pumps or system determine when the pump is required to be operable, tests may be performed during power ascension without regard to the foregoing. Where plant conditions or other circumstances arise that preclude testing of a pump and testing of other pumps or valves is commenced within 48 hours of achieving cold shutdown, the unit need not be retained in cold shutdown for the sole purpose of completing testing.

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RELIEF REQUEST NO. PR-07

COMPONENTS

Reactor Coolant Charging Pumps 1A, 1B and 1C (8770-G-078, Sh 120B)
Reactor Coolant Charging Pumps 2A, 2B and 2C (2998-G-078, Sh 122)

PART 6 REQUIREMENT

Frequency Response Range. The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump shaft rotational speed to at least 1000 Hz. (Paragraph 4.6.1.6)

BASIS FOR RELIEF

The reactor coolant charging pumps operate at approximately 205-210 rpm which equates to a rotational frequency of 3.41 Hz. The one-third minimum speed frequency response required for the vibration instrumentation correlates to 1.13 Hz (68 cpm).

The vibration instrumentation used at St. Lucie are the Computational Systems Inc. (CSI) model 2120 Machinery Analyzer with Wilcoxon model 793 accelerometer probes. The CSI 2120 Machinery Analyzer integrator frequency response is essentially flat down to DC. Wilcoxon model 793 accelerometer probe frequency response range meets the Code accuracy range requirement of +/-5% down to 1.5 Hz. The probes rated accuracy drops to only +/-10% down to a frequency of 1 Hz. This the instrumentation capability meets the Code frequency specifications for one-half pump running speed but has a frequency response accuracy specification of less than +/-5% for the one-third minimum speed. Actual vibration frequency response accuracy for the instrumentation will be better than the nominal minimum ratings specified by the manufacturer for the probes. /R4

Additionally, the calibration of the instrumentation will be to a minimum frequency of only 2 Hz. The provider of the calibration services for PSL is unable to qualify calibration to frequencies less than 2 Hz. This is due to the unavailability of suitable vibration measurement standards for performing the calibration. The NIST Calibration Service Users Guide lists the lowest frequency NIST standard pickup (24010C) available is calibrated at 2 Hz. FPL Quality Assurance Program requires this instrumentation to be calibrated and traceable to NIST standards. Again, actual vibration frequency response capability for the instrumentation will be better than the qualified calibration requirements specified above. /R4

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RELIEF REQUEST NO. PR-07
(continued)

BASIS FOR RELIEF (continued)

This frequency response range of this instrumentation adequately envelops all potential noise contributors that could indicate degradation of the charging pumps. The instrumentation is fully qualified to measure synchronous vibration levels. Additionally, it is capable of and will be used for measuring vibration frequencies at one-half and one-third running speed. Qualification of the accuracy of the readings at these frequencies is considered unnecessary and would impose undue hardship. This is considered acceptable since there are virtually NO mechanical degradation scenarios where only a sub-synchronous vibration component would develop on the charging pumps. For example:

1. Oil whirl (0.38X - 0.48X) is NOT applicable to a horizontal, triplex, reciprocating pump.

2. A light rub/impact could generate 0.5X (102.5 cpm) vibration components, but would also usually generate a sequence of integer and half-integer running speed components. A heavy rub generates increased integer values of multiple running speed components, as well as processing the 1X phase measurement. In either case the overall vibration level would still show an increase from both the attenuated sub-synchronous and 1X vibration components as well as the higher harmonic vibration components.

3. Looseness in the power train would likely be indicated by increasing 1X and 2X vibration components.

Based on the above information, the use of Computational Systems Inc. (CSI) model 2120 Machinery Analyzer with Wilcoxon model 793 accelerometer probes provides sufficiently reliable data to identify changes from baseline readings to indicate possible problems with the pumps.

ALTERNATE TESTING

During testing of these pumps, the vibration instrumentation used will be the of Computational Systems Inc. (CSI) model 2120 Machinery Analyzer with Wilcoxon model 793 accelerometer probes, or equivalent. Calibration of the instrumentation will be qualified to a minimum frequency of only 2 Hz.

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RELIEF REQUEST NO. PR-08

COMPONENTS

Hydrazine Pumps 2A and 2B (2998-G-088, Sh 1)

PART 6 REQUIREMENT

Pressure, flow rate and vibration (displacement or velocity) shall be determined and compared with the corresponding reference values. (Paragraph 5.2(d))

BASIS FOR RELIEF

The hydrazine pumps are characterized as metering pumps operating at extremely slow speed (approximately 39 rpm). This equates to a rotational frequency of 0.65 Hz. In accordance with the Code, the required low limit of the frequency response for the vibration instruments would be one third of this or 0.21 Hz. Portable instruments satisfying this requirement are commercially unavailable. The low frequency vibration instrumentation presently in use at St. Lucie is the Bentley Nevada model TK-81 with a 270 cpm probe. The TK-81 integrator frequency response is essentially flat down to 120 cpm (cycles per minute) where the displayed output of the instrument slightly increases to approximately +1dB at 100 cpm. The -3dB frequency response is reached at approximately 54 cpm. The velocity probe used with the TK-81 is a special low frequency probe nominally rated down to 270 cpm (-3 dB). For this reason, vibration readings taken, even with the low frequency probe, are essentially meaningless and of no value in identifying degradation of these pumps. Furthermore, the classical analysis of rotating components upon which the Code is based is not readily adaptable to slow moving components such as are installed in these pumps.

These pumps are standby pumps and little degradation is expected with respect to vibration performance between testing periods. The mechanisms of wear and degradation or rotating machinery are time and cycle dependant and, in this case, the number of repetitive wearing actions (cycles) is small both in frequency and absolute numbers. The pumps cycle approximately 2220 times per hour and operation is typically limited to 1-2 hours per <u>year</u>. Thus, the probability of any significant pump deterioration over the plant's lifetime is extremely small. Note that these pumps are designed and built for continuous operation.

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RELIEF REQUEST NO. PR-08

(continued)

ALTERNATE TESTING

In lieu of measuring pump vibration, these pumps will be maintained and inspected in accordance with the St. Lucie Preventative Maintenance Program that reflects the recommendations of the pump's manufacturer (Union Pump Co.). This program will, at a minimum, include periodic changing of the crankcase lubricating oil and oil analyses to identify significant wearing of internals. This program is adequate for determining pump degradation that could impact operability and reliability.

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RELIEF REQUEST NO. PR-09

COMPONENTS

Hydrazine Pumps 2A and 2B (2998-G-088, Sh 1)

PART 6 REQUIREMENT

An inservice test shall be conducted with the pump operating at specified test reference conditions. The test parameters shown in Table 2 shall be determined and recorded as directed in this paragraph. (Paragraph 5.2)

Pressure, flowrate and vibration (displacement or velocity) shall be determined and compared with corresponding reference values. (Paragraph 5.2(d))

BASIS FOR RELIEF

The hydrazine pumps are reciprocating positive displacement pumps with variable speed control. They are classified as metering pumps and are designed to accurately displace a predetermined volume of liquid in a specific period of time. The pump has a single plunger and makes only one suction and one discharge stroke during each cycle (shaft rotation).

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RELIEF REQUEST NO. PR-09
(continued)

BASIS FOR RELIEF (continued)

The pumps operate at a very slow speed (as low as 37 cpm) to supply the technical specification required hydrazine flowrate of 0.71 to 0.82 gpm. Due to the simplified design of these pumps, instantaneous flow is continuously accelerating and decelerating - following an oscillating waveform. Each cycle of the pump is approximately 1.6 seconds in duration with no flow produced during the pumps' 0.8 second suction stroke. The installed flowrate instrumentation utilizes a differential pressure orifice located in the suction line common to both pumps. Due to the characteristic oscillating flowrate, flow through this orifice pulsates sharply with each pump stroke resulting in erratic flowrate readings. The flow orifice also senses pressure feedback during each pump stroke cycle as a result of echoes of the pressure pulsation produced by the pump stroke which are reflected back to the flow element by the system piping and valves. The characteristic oscillating flowrate also makes it impractical to dampen using standard dampening devices. These flow characteristics and the design limitation of the installed flow instrumentation make it impractical and inadequate for inservice testing purposes.

Previous testing has demonstrated that techniques for determining flowrate by averaging the indicated flowrate readings are inconsistent and inaccurate when compared to actual flow. For this reason, trending the flowrate using the installed instrumentation is impractical due to the inherent inaccuracies and instability in measuring the pump flow as described above.

These pumps are standby pumps that remain idle during most plant operation except for testing periods, thus, service-related degradation with respect to hydraulic performance between testing periods is unlikely. Consequently, the alternate testing will provide adequate monitoring of these pumps with respect to the applicable Code requirements to ensure continued operability and availability for accident mitigation.

The flowrates of the pumps can be determined by collecting the pumps' output in a container of known volume over a measured period of time and thereby calculating the flowrate. A correlation between pump speed and average flowrate has been developed and confirmed based on piston displacement.

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RELIEF REQUEST NO. PR-09
(continued)

BASIS FOR RELIEF (continued)

Although not physically impractical, frequent performance of the above described flow testing is undesirable based on the personnel hazards associated with testing. Hydrazine is a hazardous, highly flammable liquid with cumulative toxic effects when absorbed through the skin, inhaled or ingested. It has also been identified as a known carcinogen. For this reason, it is proposed to perform this testing only during refueling outages. Measuring flowrate as described above during each refueling outage is appropriate and adequate for detecting any significant pump degradation and ensuring the continued operability and reliability of these pumps.

Note that this alternate testing plan is consistent with the intent of that provided in Generic Letter 89-04, Position 9.

ALTERNATE TESTING

During the quarterly pump tests, each pump will be operated at nominal rated speed and pump discharge pressure and speed will be measured.

During each refueling outage at least one test will be performed for each pump measuring actual pump flowrate to verify proper performance. Pump discharge pressure and speed will also be measured.

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RELIEF REQUEST NO. PR-10

COMPONENTS

Diesel Fuel Oil Transfer Pumps 1A and 1B (8770-G-086, Sh 1)
Diesel Fuel Oil Transfer Pumps 2A and 2B (2998-G-086, Sh 1)

PART 6 REQUIREMENTS

An inservice test shall be run on each pump, nominally every 3 months, except as provided in paras. 5.3, 5.4 and 5.5. (Part 6, Para. 5.1)

BASIS FOR RELIEF

> **NOTE**
> The diesel fuel oil system was optionally upgraded to Class 3 and thus, testing is optional per ASME B&PV Code, Section XI, Paragraph IWA-1320(e). Consequently, this relief request is provided for information only and approval is not required.

The only readily available test circuit for these pumps consists of the normal day tank fill lines from the diesel oil storage tanks. There is a minimum flow recirculation line, however no instrumentation is installed that could provide flowrate information. A pump flowrate can be determining by calculating the fill rate of the day tanks, however, considering the usable volume of a day tank (150 gal.) and the rated capacity of the pumps (25 gpm @ 80 ft. head), the run time to refill a tank is insufficient to provide adequate time for deriving reliable and consistent flowrate data.

An alternate flowpath can be made available but is significantly more difficult to align and set up a flow test. This testing entails adjusting the levels in the fuel oil tanks and then aligning to pump between the tanks. Although this can provide adequate flowrate determination and pump performance evaluation, it is a complex test to perform and impractical to perform quarterly or even during cold shutdown conditions.

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RELIEF REQUEST NO. PR-10
(continued)

BASIS FOR RELIEF (continued)

Considering the capacity of the pumps (in excess of 25 gpm) is significantly greater than the predicted oil consumption of the diesel generators (approximately 5 gpm per generator) and the fact that the pumps are seldom operated (only during diesel generator testing), extending the test interval to 2 years will not significantly affect the reliability and availability of the diesel generators with respect to the capability of performing their intended safety function.

ALTERNATE TESTING

Each of these pumps will be tested every two (2) years.

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RELIEF REQUEST NO. PR-11

COMPONENTS

Various - This is a generic relief request.

PART 6 REQUIREMENTS

If deviations fall within the alert range of Table 3, the frequency of testing specified in para. 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected. If deviations fall within the required action range of Table 3, the pump shall be declared inoperable until the cause of the deviation has been determined and the condition corrected. (Para. 6.1)

BASIS FOR RELIEF

The 1995 Edition of ASME OM-Code provides an alternate concept of corrective action should a pumps' performance enter the action required range. Specifically, Paragraph ISTB 6.2.2 permits an analysis of the pump and establishment of new reference values. This can avoid premature maintenance of a pump that is subject to expected continual and gradual deterioration over time while operating at a level where it is fully capable of reliably performing its designated safety function.

By using the test requirements of the 1995 Code edition, St. Lucie Plant can reduce the frequency of unnecessary pump maintenance with essentially no adverse effect on plant safety since it can be assumed that the new Code requirements are equivalent to (or better than) the 1988 addenda.

In addition, by expanding this capability to pumps that are in the alert range, frequent and unnecessary testing can be avoided. Note that, in most cases, more frequent testing of pumps is itself a degrading mechanism. This also is required to avoid unnecessary plant shutdown for pumps that are tested at cold shutdown should a pump enter the alert range during such testing.

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RELIEF REQUEST NO. PR-11
(continued)

ALTERNATE TESTING

In cases where a pumps' test parameters fall within either the alert or action required range and the pumps' continued use at the changed values is supported by an analysis, a new set of reference values may be established. The accompanying analysis will include verification of the pumps' operational readiness and an evaluation of test data that verifies that the subject pump is not expected to fall below the minimum required performance level in the periods between testing. The analysis will include both pump and system level operational readiness evaluations, description of the cause of the change in pump performance and an evaluation of all trends indicated by the available test and maintenance data. The results of this analysis will be documented in the record of tests.

RELIEF REQUEST NO. PR-12

COMPONENTS

Low Pressure Safety Injection Pump 1A and 1B (8770-G-078, Sh 130B)

PART 6 REQUIREMENT

If deviations fall within the alert range of Table 3, the frequency of testing specified in paragraph 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected. (Paragraph 6.1)

BASIS FOR RELIEF

The pumps are tested quarterly under minimum flow conditions (less than 2 percent of nominal flow) using the minimum flow recirculation piping and, during each refueling, at nominal design flowrate. Note, the flowrate experienced during quarterly testing is considerably less than that expected during accident or normal operational conditions. During the process of establishing new reference values for the quarterly tests related to implementation of the OM Code, it was discovered that the reference values for vibration for these pumps are near or exceed the absolute alert level of 0.325 in/sec. set forth in Table 3. Using the IRD Model 810 w/Model 970 Accelerometer Probe, the vibration levels at the pump bearings range between 0.28 and 0.38 in/sec. Because of this, these pumps will perpetually remain in "alert" since when operating at low flow at least one of these readings typically exceeds the alert limit established by Table 3 (0.325 in/sec). During the cold shutdown testing (substantial flow), vibration measurements are expected to be acceptable and well below the absolute alert limits of Table 3.

Due to the inherent design of the pumps, at low flows increased levels of vibration are induced as a consequence of energy dissipation and internal recirculation. Spectral analyses and pump vibration signatures confirm that the increased levels of vibration experienced at low flows are in the frequency range of five time rotational frequency, and thus, are a function or impeller design. In addition, there are significant levels of broad band vibration that is attributable to hydraulic instability. For this reason, it is clear that the increased vibration levels observed during low flow operation are, for the most part, unrelated to pump condition (degradation).

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RELIEF REQUEST NO. PR-12
(continued)

BASIS FOR RELIEF (continued)

ASME OM Code 1995 and later revisions allow the classification of pumps into two groups, A and B, where the Group B pumps are those used for standby service, of which these pumps qualify. Recognizing that pump degradation that would manifest itself in increased vibration levels are not expected while a pump is in a standby mode, the code committee discontinued the requirement for quarterly vibration monitoring. This also reflects the growing concern of regulators and the members of the code committee that extended operation of pumps under minimum flow conditions has a deleterious effect on pump components. Thus it is apparent that vibration monitoring in this case is insignificant and certainly does not warrant any increased frequency of testing as required by the Code.

The proposed alternate testing is adequate and appropriate, and is capable of properly monitoring pump operability as intended by the Code. It should be noted that more frequent testing of these pumps under minimum flow conditions for no justifiable reason does not add to plant safety and could have a significant negative impact on pump and system operability and reliability.

ALTERNATE TESTING

In conjunction with the quarterly testing of these pumps, vibration data will be recorded per OM Code, Paragraphs 4.6.4 and 5.2. Test results will be evaluated, and the acceptance criteria of Table 3 applied with the exception that the minimum allowable vibration level defining the alert range will be 0.500 in/sec. Should measured vibration exceed 0.500 in./sec or $2.5V_r$, the subject pump will be placed in "alert" status and the frequency of testing doubled until the cause of the deviation is determined and the condition corrected. Should measured vibration exceed 0.700 in./sec or $6V_r$, the subject pump will be declared inoperable until the cause of the deviation is determined and the condition corrected.

When these pumps are tested at substantial flow conditions (plant shutdown), the vibration acceptance criteria as shown in Table 3 will be applied unconditionally.

APPROVAL

This relief request and alternate testing shall not be implemented without specific written approval of the relief request.

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RELIEF REQUEST NO. PR-13

COMPONENTS

Low Pressure Safety Injection (LPSI) Pumps 1A and 1B (8770-G-078, Sh 130B)
Low Pressure Safety Injection (LPSI) Pumps 2A and 2B (2998-G-078, Sh 130B)

PART 6 REQUIREMENT

The full scale range of each analog instrument shall be not greater than three times the reference value (Part 6, Para. 4.6.1.2).

BASIS FOR RELIEF

Part 6, Table 1 requires the accuracy of instruments used to measure differential pressure to be equal to or better than ± 2 percent based on full-scale reading of the instrument. This means that the accuracy of the actual measurement can vary as much as ± 6 percent, assuming the range of the instrument is extended to the maximum allowed deviation (3 times the reference value).

An example of calculating indicated instrument accuracy is as follows (from NUREG-1482, Paragraph 5.5.1):

> This example uses a reference pressure value of 20 psig and an analog pressure gauge with full scale range of 60 psig that is calibrated to ± 2% of full scale.
>
> Code requirement:
>
> Reference value = 20 psig
> 3 x reference value = 60 psig
> Instrument tolerance = 1.2 psig (± 2% x 60 psig)
>
> Indicated accuracy:
>
> Instrument tolerance / Reference value x 100 = Indicated accuracy
>
> ± 1.2 psig / 20 psig x 100 = ± 6%

/R3

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RELIEF REQUEST NO. PR-13
(continued)

Following the methodology used in NUREG-1482 and the example above, the indicated instrument accuracy can be calculated for each pressure instrument in this relief request. The following table provides the calculated indicated instrument accuracies:

Table 1: Calculated Instrument Accuracies for Selected Pressure Instruments

PUMP ID	INSTR NUMBER	PARAMETER	REF VALUE	INSTR RANGE	INSTR ACCUR	INSTR TOL	IND ACCUR
1A LPSI	PI-3314	Discharge Pressure	200 PSIG	0-600 PSIG	± 0.5%	± 3 PSIG	± 1.5%
1B LPSI	PI-3315	Discharge Pressure	195 PSIG	0-600 PSIG	± 0.5%	± 3 PSIG	± 1.5%
2A LPSI	PI-3314	Discharge Pressure	190 PSIG	0-600 PSIG	± 0.5%	± 3 PSIG	± 1.6%
2B LPSI	PI-3315	Discharge Pressure	185 PSIG	0-600 PSIG	± 0.5%	± 3 PSIG	± 1.6%

Where:

REF VALUE = reference value established by the procedure

INSTR ACCUR = accuracy to which instrument is calibrated

INSTR TOL = maximum INSTR RANGE times INSTR ACCUR

IND ACCUR = INSTR TOL divided by REF VALUE times 100

/R3

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RELIEF REQUEST NO. PR-13

(continued)

As shown on Table 1, the indicated accuracy for all the instruments is less than ± 6% of the reference value. These accuracy's are the same or better than those allowed by the Code. Therefore, there is no overall impact on the capability to detect and monitor degradation during pump tests based on use of these instruments. Continued use of the existing installed instruments is supported by NUREG-1482, Paragraph 5.5.1 which states that when the range of an installed analog instrument is greater than 3 times the reference value but the accuracy of the instrument is more conservative than the Code, NRC staff will grant relief when the combination of the range and accuracy yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements (i.e., up to ± 6%).

ALTERNATE TESTING

Since the indicated accuracy of each permanently installed is less than the ± 6 percent allowed tolerance, FPL requests approval for continued use of the instruments listed in this relief request.

END OF APPENDIX A

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-01

SYSTEM

Various - This is a generic relief request.

COMPONENTS

All safety and relief valves tested under ambient conditions using a test medium at ambient conditions.

CATEGORY

C

FUNCTION

Provide over-pressure protection to associated systems

PART 1 REQUIREMENT

Temperature Stability. The test method shall be such that the temperature of the valve body shall be known and stabilized before commencing set pressure testing, with no change in measured temperature of more than 10°F (5°C) in 30 minutes. (Paragraph 8.1.3.4)

BASIS FOR RELIEF

For valves tested under normal prevailing ambient (shop) conditions with the test medium at approximately the same temperature, the requirement for verifying temperature stability is inappropriate and of no value. There is little or no consequence of minor variations in ambient temperature.

This has been identified by the OM-1 Code Working Group and the ASME Code Committees and is reflected in the latest version of the Code (OM Code-1996) Paragraphs I 8.1.2(d) and I 8.1.3(d).

ALTERNATE TESTING

For safety and relief valves tested under ambient conditions using a test medium at ambient conditions, the valve body temperature will be measured and recorded prior to each series of tests (which may consist of multiple lifts) but there will be no verification of attaining thermal equilibrium.

APPENDIX B /R4

REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-03

SYSTEM

Various - This is a generic relief request.

COMPONENTS

All Class 2 and 3 safety and relief valves used for compressible fluid services other than steam.

CATEGORY

C

FUNCTION

Provide over-pressure protection to associated systems

PART 1 REQUIREMENT

Accumulator Volume. There shall be a minimum accumulator volume below the valve inlet, based on the valve capacity (cu ft) and calculated from the following formula:

Minimum Volume = [valve capacity (cu ft per sec) X time open (sec) / 10]. (Paragraph 8.1.2.2)

BASIS FOR RELIEF

The accumulator volume requirement is not required for simple determination of the valve set pressure. This was recognized by the Code Committee and corrected in more recent versions of the OM Code.

ALTERNATE TESTING

The volume of the accumulator drum and the pressure source flowrate shall be sufficient to determine the valve set-pressure. (Ref. ASME OM Code-1996, Paragraph I 8.1.2(b))

APPENDIX B

REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-04

SYSTEM

Safety Injection (2998-G-078, Sh 131 & 132; 8770-G-78, Sh 131 A&B)

COMPONENTS

Unit 1:

V3113, V3123, V3133, V3143, V3114, V3124, V3134, V3144, V3215, V3225, V3235, V3245, V3217, V3227, V3237, V3247

Unit 2:

V3215, V3225, V3235, V3245, V3217, V3227, V3237, V3247, V3258, V3259, V3260, V3261, V3524, V3525, V3526, V3527

CATEGORY

AC

FUNCTION

These valves close to provide safety system isolation from the reactor coolant system.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

Valves full-stroke exercised at shutdowns shall be exercised during each shutdown, except as specified in (g) below. Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months. (Paragraph 4.3.2.2(f))

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-04
(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor for determining disc position, thus the only practical means of verifying closure is by performing a leakage or backflow test.
Performing backflow or leakage tests of these valves typically involves a considerable effort with the test connections and valves required for the test alignment in radiation areas with inconvenient access provisions.

All associated lines connected to the reactor coolant system are provided with high pressure alarms that would alert Operations personnel to any significant failure of the inboard valves that could endanger low pressure systems.

Leak testing to verify the closure capability of these valves is primarily for the purpose of confirming their capability of preventing over-pressurization and catastrophic failure of the safety injection piping and components. In this regard, St. Lucie Technical Specification 4.4.6.2 addresses the valve test frequency in a manner appropriate for these valves. Performing the leak testing as prescribed in the Technical Specifications is adequate to ensure proper and reliable operation of these valves.

Note that, in Unit 1, SIT Outlet Check Valves V3215, V3225, V3235 and V3245 are not specifically listed in the Technical Specifications as pressure isolation valves; however, as a result of a plant commitment, they are treated as pressure isolation valves with administrative testing requirements equivalent to those of the Technical Specifications.

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-04
(continued)

ALTERNATE TESTING

The closure capability of these check valves shall be demonstrated per the applicable Technical Specification by verifying leakage to be within its limits during cold shutdown outages only when any of the following conditions are met:

1. At least once per 18 months (Unit 2 only).

2. Prior to entering MODE 2 after refueling (Unit 1 only).

3. Prior to entering MODE 2 whenever the plant has been in COLD SHUTDOWN for 7 days or more and if leakage testing has not been performed in the previous 9 months.

4. Prior to returning the valve to service following maintenance, repair or replacement work on the valve.

5. Following valve actuation due to flow through a valve (Unit 2 only).

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REQUESTS FOR RELIEF - VALVES

RELIEF REQUEST NO. VR-05

SYSTEM

Safety Injection (2998-G-078 Sh 132; 8770-G-078 Sh 131B)

COMPONENTS

V3215
V3225
V3235
V3245

CATEGORY

A/C

FUNCTION

These valves open to provide flowpaths from the respective safety injection tanks (SITs) to the reactor coolant system (RCS) and close to isolate the tanks from the high pressure of the RCS and the safety injection headers providing RCS integrity and preventing diversion of safety injection flow.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-05
(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising or for determining disc position. Consequently, the only practical method for stroke testing of the SIT discharge check valves is to discharge the contents of the SITs to the RCS. Performing a full flow test of the SIT discharge check valves during any plant operating mode is impractical because the maximum flowrates attainable by discharging the contents of the SIT to the RCS can not meet the valves' maximum required accident condition flowrate as required by Generic Letter 89-04, Position 1. The maximum flowrate achievable during an SIT discharge test is restricted by the long stroke time of the SIT discharge isolation valves - motor-operated valves with a nominal stroke time of 52 seconds and limitations on SIT pressure during testing. Under large break LOCA accident conditions, the maximum (peak) flowrate through these valves would be approximately 20,000 gpm as compared to typical test values of approximately 8,000 gpm.

Although the flowrate attained during these SIT discharge tests does not qualify as "full flow", it is sufficient to fully stroke the check valve discs to their fully open position. Verification of this is possible using non-intrusive testing techniques. Due to system configuration, however, full-stroke exercising of the SIT discharge check valves can not be performed in any plant operating mode other than refueling when the reactor vessel head is removed.

The SIT discharge check valves are identical with respect to size and design and they are installed in essentially identical orientations exposed to similar operating conditions. Each has been disassembled and inspected several times during previous refueling outages with no abnormal wear or deterioration noted. Additionally, FPL has reviewed the operating and maintenance history of similar valves used throughout the industry under comparable conditions. Based on these reviews and inspections, there has been no evidence of valve degradation with respect to their ability to open and satisfactorily pass the required flow needed to fulfill their safety function. This along with the observation that the SIT flowrate and pressure drop traces obtained during the 1994 refueling outage testing are nearly identical, indicate that this baseline data was taken when each valve was in good working condition.

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RELIEF REQUEST NO. VR-05

(continued)

BASIS FOR RELIEF (continued)

Partial-stroke (open) of these valves requires discharging from the SITs to either the reactor coolant system (RCS) or the SIT drain header and RWT. Flow directed to the reactor coolant system during normal plant operation is impossible since the pressure in the SIT cannot overcome RCS pressure to establish flow. Verification of flow via the drain lines to the RWT requires opening two manual containment isolation valves for Unit 1 and an outside manual containment isolation valve and an inside solenoid-operated containment isolation valve for Unit 2. In both cases the potential risk of the loss containment integrity in the event of an accident due to single active failure or dependence on operator action makes this unacceptable and impractical. (Reference NUREG-1482, Paragraph 3.1.1)

In addition to flow testing, each valve is confirmed to be closed under cold shutdown conditions and is subjected to periodic leakage tests. Note that, for this type of valve, the prescribed leakage testing is especially sensitive to internal valve degradation.

ALTERNATE TESTING

Each SIT discharge check valve will be partial-stroke exercised at cold shutdown and full-stroked in the open direction during refueling outage by discharging all four SIT to the reactor vessel.

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RELIEF REQUEST NO. VR-05
(continued)

ALTERNATE TESTING (continued)

Each SIT discharge check valve will be verified closed and leakrate tested in accordance with Relief Request VR-04. During each refueling outage, under a sampling program on a rotating schedule, at least one of the check valves will be non-intrusively tested to verify its disc fully strokes to its backstop.

Should a valve be found to be inoperable and incapable of performing its function to open, then the remaining three valves will be non-intrusively tested during the same outage, after which the rotational inspection schedule will be reinitiated.

This alternative testing as outlined is consistent with the requirements and recommendations of NRC Generic Letter 89-04, Position 1 and NUREG-1482, “Guidelines for Inservice Testing at Nuclear Power Plants”, Paragraph 4.1.2.

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-06

SYSTEM

Safety Injection (2998-G-078 Sh 132; 8770-G-078 Sh 131B)

COMPONENTS

V3217
V3227
V3237
V3247

CATEGORY

A/C

FUNCTION

These valves open to provide flowpaths from the safety injection headers to the reactor coolant system (RCS) and close to isolate the headers from the high pressure of the RCS.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

APPENDIX B
REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-06
(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor determining disc position. Consequently, the only practical method for stroke testing of these check valves is by injection via the safety injection pumps or discharging the contents of the safety injection tank (SIT) to the RCS.

During plant operations at power, partial flow exercising these valves is not practical because neither the SITs nor the safety injection pumps are capable of overcoming reactor coolant system pressure.

Performing a full-flow test of these check valves by SIT discharge is impractical because the maximum flowrates attained by discharging the contents of the SITs to the RCS do not meet the valves' maximum required accident condition flow as required by Generic Letter 89-04, Position 1. The maximum flowrate achievable during an SIT discharge test is restricted by the long stroke time of the SIT discharge isolation valve. This is based on the motor-operated valves nominal stroke time of 52 seconds and limitations on SIT pressure during testing.

Under large break LOCA accident conditions, the maximum (peak) flowrate through these valves would be approximately 20,000 gpm as compared to test values of approximately 8,000 gpm. Note also that normal shutdown cooling system flow is incapable of full stroking these valves based on the requirements of Generic Letter 89-04.

Although the flowrate attained during these SIT discharge tests does not qualify as "full flow," it is sufficient to fully stroke the check valve discs to the fully open position and verification of this is practical using non-intrusive testing techniques. Due to system configuration, however, full-stroke exercising of the SIT discharge check valves can not be performed in any plant mode other than refueling shutdown when the reactor vessel head is removed.

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-06
(continued)

BASIS FOR RELIEF (continued)

The safety injection header check valves are identical with respect to size and design and they are installed in essentially identical orientations exposed to similar operating conditions. Each has been disassembled and inspected several times during previous refueling outages with no abnormal wear or deterioration noted. FPL has additionally reviewed the operating and maintenance history of similar valves used throughout the industry under comparable conditions. Based on these reviews and inspections, there has been no evidence of valve degradation with respect to their ability to open and satisfactorily pass the required flow needed to fulfill their safety function. This, along with the observation that the SIT flowrate and pressure drop traces obtained during the 1994 refueling outage testing are nearly identical, indicate that this baseline data was taken when each valve was in similar good working condition.

In addition to flow testing, each valve is confirmed to be closed under cold shutdown conditions and is subjected to periodic leakage tests. Note that, for this type of valve, leakage testing is especially sensitive to internal valve degradation.

ALTERNATE TESTING

Each safety injection header check valve will be partial-stroke exercised at cold shutdown and full-stroked in the open direction during refueling outages by discharging all four SITs to the reactor vessel.

RELIEF REQUEST NO. VR-06
(continued)

ALTERNATE TESTING (continued)

Each safety injection header check valve to be verified closed and leakrate tested in accordance with Relief Request VR-04. During each refueling outage, under a sampling program on a rotating schedule, at least one of the check valves, will be non-intrusively tested to verify its disc fully strokes to its backstop.

Should a valve be found to be inoperable and incapable of performing its function to open, then the remaining three valves will be non-intrusively tested during the same outage, after which the rotational inspection schedule will be reinitiated.

This alternative testing as outlined is consistent with the requirements and recommendations of NRC Generic Letter 89-04, Position 1 and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Paragraph 4.1.2.

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RELIEF REQUEST NO. VR-07

SYSTEM

Main Steam (8770-G-079, Sh 1)

COMPONENTS

V08117
V08148

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the steam generators to the main turbine generators - non-safety function. They close to prevent unrestricted release of steam from an unaffected steam generator in the event of a steam line rupture upstream of an MSIV. They are a redundant barrier along with the main steam isolation valve in the opposite main steam line.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-07
(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor for determining obturator position. Due to the high operational temperature of the valves, non-obtrusive testing is impractical. Furthermore, there is no practical means or provision for pressurizing the piping downstream of these valves in order to conclusively verify closure of these valves via back leakage tests.

These are large valves (34-inch NPS) where disassembly is difficult and consumes a considerable amount of plant resources, thus disassembly of both of these valves during each reactor refueling would pose a significant hardship and, based on plant safety considerations, is not warranted. These valves are identical with the same manufacturer, size, model designation, orientation and service conditions.

ALTERNATE TESTING

During each reactor refueling outage at least one of these valves will be disassembled, inspected and manually stroked to verify operability. Should a valve under inspection be found to be inoperable, then the other valve will be inspected during the same outage, after which the rotational inspection schedule will be reinitiated. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods and final close-out inspections.

Following valve re-assembly forward flow operation of the valves will be observed during the ensuing startup.

This alternate testing satisfies the requirements of Generic letter 89-04, Position 2 and agrees with related comments and recommendations in NUREG-1482, Appendix A.

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RELIEF REQUEST NO. VR-08

SYSTEM

Main Steam (2998-G-079, Sh 1; 8770-G-079, Sh 1)

COMPONENTS

V08130
V08163

CATEGORY

C

FUNCTION

These valves open to provide flowpaths for steam from the stem generators to AFW Pumps 1C and 2C turbine drivers. They close under accident conditions to isolate the unaffected steam generator and prevent the uncontrolled blowdown of both steam generators.

DISCUSSION

These are simple check valves with no external means of exercising or determining obturator position. Verifying closure of these valves during plant operation at normal operating pressures would require isolating the associated steam generator from the steam supply lines and venting the piping between the closed isolation valve and the check valve. It is considered to be imprudent to isolate a steam supply to the AFW pumps during operation and, in addition, it is undesirable to subject plant personnel to the hazards associated with venting live steam at these operating conditions. Furthermore, it is likely that testing in this manner would provide inconclusive results.

The physical configuration of piping and valves in the steam supply line differs between Unit 1 and Unit 2.

/R4

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RELIEF REQUEST NO. VR-08
(continued)

DISCUSSION (continued)

For Unit 1, an isolation valve and vent/drain valve is available so that backflow testing of one of the steam supply check valves is possible. In this case, the other steam supply check valve must be disassembled to provide a connection for a dedicated air compressor for the backflow test. As a result, testing during normal operation or cold shutdown is not practicable. NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to setup test equipment is adequate justification to defer backflow testing until a refueling outage..."

For Unit 2, piping immediately upstream of the steam supply check valves has no telltale vent or drain with sufficient vent path capacity to adequately test the valve for closure without imposing overly restrictive leakage limits on the valve well below those required by any safety analyses. To expand the tested system boundary upstream of the valve to encompass a telltale vent or drain with sufficient vent path capacity would impose an undue hardship for the utility. This testing would require all maintenance activities associated with the pressure boundary of the steam generators and significant portions of main steam and feedwater piping to be stopped and the system secured to safely perform the testing. Since this test should only be performed during a refueling outage, much of these systems are undergoing maintenance. As a result, this test could significantly increase outage scope, cost and duration. This is considered an undue burden to the utility when disassembly and inspection of the valves would involve considerably less resources and is an approved alternative in accordance with the guidelines of NRC Generic Letter 89.04, Position 2.

ALTERNATE TESTING

Unit 1

During each reactor refueling outage one of the Unit 1 valves will be verified to close while the other will be disassembled and inspected and manually stroked to verify operability in accordance with OM Part 10, Paragraph 4.3.2.4(c). Following valve reassembly forward flow operation of the valve will be observed during the ensuring startup.

/R4

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RELIEF REQUEST NO. VR-08
(continued)

ALTERNATE TESTING (continued)

Unit 2

During each reactor refueling outage, at least one of these valves will be disassembled, inspected and manually stroked to verify operability. Should a valve under inspection be found to be inoperable, then the other valve in that unit will be inspected during that same outage, after which the rotational inspection schedule will be reinitiated. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-working periods and final close-out inspections. Following re-assembly, each valve will be partial-flow exercised to verify operability.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and, as such, is considered to be approved upon submittal.

/R4

APPENDIX B
REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-10

SYSTEM

Feedwater System (8770-G-080, Sh 3)

COMPONENTS

V09248
V09280

CATEGORY

C

FUNCTION

These valves close to isolate the respective steam generator to ensure adequate inventory of condensate for auxiliary feedwater pump operation.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor determining disk position. Consequently, the only practical method for determining disk position (close) is by performing a differential pressure back-leakage test. Due to system configuration, there is no practical way of reliably performing such a test during any plant operational mode. Under steaming conditions at power, isolation of the feedwater supply piping is not possible without causing a conditions at power, isolation of the feedwater supply piping is not possible without causing a severe plant transient. Under shutdown conditions, backflow testing would require draining a significant portion of the upstream feedwater piping and attempting to seat the subject valves by injection of water through the associated 1-inch downstream drain valves. It is highly unlikely that such a test could be performed successfully and conclusively.

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RELIEF REQUEST NO. VR-10
(continued)

ALTERNATE TESTING

During each reactor refueling outage at least one of these valves will be disassembled, inspected and manually stroked to verify closure capability. Should a valve under inspection be found to be inoperable, then the other valve will be inspected during the same outage, after which the rotational inspection schedule will be reinitiated. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods and final close-out inspections.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and, as such, is considered to be approved upon submittal.

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RELIEF REQUEST NO. VR-11

SYSTEM

Feedwater System (2998-G-080, Sh 2B; 8770-G-080, Sh 4)

COMPONENTS

V09303 (Unit 2 only)
V09304
V09305

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from each auxiliary feedwater pumps' discharge to the condensate storage tank to ensure adequate pump cooling during low flow conditions.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor determining disk position. Consequently, the only practical method for determining disk position (open) is by performing a pump flowrate test. Full stroke capability must then be verified, per Generic Letter 89-04, Position 1, by attaining the maximum accident flowrate through each valve. There is no flowrate instrumentation available to verify valve full-stroke exercising of these valves as required by the Generic Letter.

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RELIEF REQUEST NO. VR-11
(continued)

BASIS FOR RELIEF (continued)

The lines in which these valves are installed are provided with permanent orifices that restrict the flowrate such that the maximum possible is insufficient to fully open these valves. For this reason, non-intrusive testing would be ineffective and inconclusive and thus is not practical.

The associated auxiliary feedwater pumps are normally idle in standby status operated only during test periods, thus these valves see little service and service-related failures are unlikely.

ALTERNATE TESTING

During quarterly pump testing each of these valves will be partial-stroked exercised via recirculation through the minimum flow test circuits with no flow measurements.

During each reactor refueling outage at least one of these valves will be disassembled, inspected and manually stroked to verify operability. Should a valve or valves under inspection be found to be inoperable, then the other valve or valves in that unit will be inspected during the same outage, after which the rotational inspection schedule will be reinitiated. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods and final close-out inspections.

Following re-assembly, each valve will be partial-flow exercised to verify operability.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and, as such, is considered to be approved upon submittal.

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REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-12

SYSTEM

Instrument Air System (2998-G-085 Sh 2A; 8770-G-085, Sh 2A&3)

COMPONENTS

Unit 1:

Vacuum Breaker Supply		MSIV Accum. Supply	
V18290	V18294	V18695	V18699
V18291	V18295	V18696	V18099

Unit 2:

Vacuum Breaker Supply	
V18290	V18294
V18291	V18295

CATEGORY

C

FUNCTION

These valves close to trap air in the accumulators supplying the primary containment vacuum breaker valves and, for Unit 1, the MSIVs in the event of a loss of pressure in the plant main instrument air headers.

PART 10 REQUIREMENT

During plant operation, each check valve shall be exercised or examined in a manner which verifies obturator travel to the closed, full-open or partially open position required to fulfill its function. (Paragraph 4.3.2.2(a))

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RELIEF REQUEST NO. VR-12
(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor for determining disk position. Consequently, the only practical method for determining disk position is by performing a back-leakage test, however, these check valves are installed with each pair in series with no provision for verification that each individual valve is closed.

For these applications only one valve need close. Both valves are designated as ISI Class 2 (Class 3 for MSIV accumulators) and, as such, both valves in each line will be treated with the same quality assurance requirements.

ALTERNATE TESTING

Either of these valves will be verified to close by performing a back-leakage on the series combination of valves. In the event that both valves fail to close, the combination will be declared inoperable and both valves will be repaired or replaced, as appropriate.

This is consistent with the guidance provided in NUREG-1482, Paragraph 4.1.1.

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RELIEF REQUEST NO. VR-13

SYSTEM

EDG Fuel Oil Transfer (2998-G-086 Sh 1; 8770-G-086 Sh 1)

COMPONENTS

V17204
V17214

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the diesel generator fuel oil transfer pumps to the respective fuel oil day tanks.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

BASIS FOR RELIEF

> **NOTE**
> The diesel fuel oil system was optionally upgraded to Class 3 and thus, testing is optional per ASME B&PV Code, Section XI, Paragraph IWA-1320(e). Consequently, this relief request is provided for information only and approval is not required.

These are simple check valves with no external means of exercising nor for determining disk position. Consequently, the only practical method of determining disk position (open) is by performing a pump flowrate test. Full stroke capability must then be verified, per Generic Letter 89-04, by attaining the maximum accident flowrate through each valve.

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RELIEF REQUEST NO. VR-13
(continued)

BASIS FOR RELIEF (continued)

The only readily available test circuit for the EDG fuel oil transfer pumps consists of the normal day tank fill lines from the diesel oil storage tanks. There is a minimum flow recirculation line, however no flow instrumentation is installed that could provide flowrate information. Using the normal day tank fill line, a pump flowrate can be determined by calculating the fill rate of the day tanks, however, considering the usable volume of a day tank (150 gal.) and the rated capacity of the pumps (25 gpm @ 80 ft. head), the run time to refill a tank is insufficient to provide reliable and consistent flowrate data.

An alternate flowpath can be made available but is significantly more difficult to align and set up a flow test. This alternate method requires adjusting the levels in the main fuel oil tanks and then aligning to pump between the tanks. Although this can provide for adequate flowrate determination and valve performance evaluation, it is a complex test to perform and impractical to perform quarterly or even during cold shutdown periods.

Considering that the capacity of these lines to provide fuel oil to the day tanks (in excess of 25 gpm) is significantly greater than the predicted oil consumption of the diesel generators (approximately 5 gpm) and the fact that the valves are seldom operated (only during diesel generator testing), extending the test interval to 2 years will not significantly affect the reliability and availability of the diesel generators with respect to the capability of performing their intended safety function.

ALTERNATE TESTING

Each of these valves will be partial-stroke exercised quarterly and full-stroke tested every two (2) years.

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RELIEF REQUEST NO. VR-14

SYSTEM

Containment Spray (2998-G-088 Sh 1; 8770-G-088, Sh 1)

COMPONENTS

V07119
V07120

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the refueling water tanks (RWT) to the containment spray and safety injection suction headers. They close to prevent the transfer of containment sump water back to the associated RWT after a recirculation actuation signal (RAS).

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

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REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-14

(continued)

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor determining obturator position. Full stroke exercising (open) of these valves would require the simultaneous operation of one high pressure safety injection (HPSI) pump, one low pressure safety injection (LPSI) pump, and one containment spray pump to verify that each valve can pass the maximum design accident flow. Such a test is not practical during any plant operational mode. Non-intrusive testing (NIT) of these valves necessarily requires that each valve undergo a full stroke cycle induced by flow through the associated piping. In this case, the maximum flowrate possible in the line is approximately 4,500 gpm - the nominal design flowrate of the LPSI pumps. At this flowrate, taking into consideration that these 24-inch NPS valves are on the suction side of the pumps and not subjected to a starting pressure surge at the pump discharge; they will not travel to the full-open position with a backstop impact when the associated LPSI pump is started or running. This precludes any meaningful, reliable, and conclusive non-intrusive testing.

These are large valves (24-inch NPS) where disassembly is difficult and consumes a considerable amount of plant resources, thus disassembly of both of these valves during each reactor refueling would pose a significant hardship and, based on plant safety considerations, is not warranted. In addition, access for disassembly requires draining a significant portion of the safety injection system piping creating a significant and unnecessary load on the plants' radwaste processing systems.

These valves are identical with the same manufacturer, size, model designation, orientation and service conditions.

ALTERNATE TESTING

During quarterly pump testing each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits of the various safety injection systems.

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REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-14

(continued)

ALTERNATE TESTING (continued)

During each reactor refueling outage at least one of these valves will be disassembled, inspected and manually stroked to verify OPEN and CLOSED operability. Should a valve under inspection be found to be inoperable, then the other valve will be inspected during the same outage, after which the rotational inspection schedule will be reinitiated. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods and final close-out inspections.

Following re-assembly, each valve will be partial-flow exercised open and tested closed to verify operability.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and with related comments and recommendations in NUREG-1482, Appendix A.

/R4

RELIEF REQUEST NO. VR-16

SYSTEM

Containment Spray (2998-G-088 Sh 2; 8770-G-088, Sh 2)

COMPONENTS

V07172
V07174

CATEGORY

C

FUNCTION

These check valves open to provide flowpaths from the containment sumps to the containment spray and safety injection pumps during post-accident recirculation cooling (RAS).

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

BASIS FOR RELIEF

These are simple check valves with no external means of exercising or determining obturator position. Exercising with system flow is not practical since there is no water inventory available in the containment sump and flooding the sump for such a test is undesirable and impractical since it would have the potential for upsetting the chemistry of the RCS by introducing contaminants into the safety injection system.

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RELIEF REQUEST NO. VR-16
(continued)

BASIS FOR RELIEF (continued)

These are large valves (24-inch NPS) where disassembly is difficult and consumes a considerable amount of plant resources, thus disassembly of both of these valves during each reactor refueling would pose a significant hardship and, based on plant safety considerations, is not warranted. In addition, access for disassembly requires draining a significant portion of the safety injection system piping creating a sizable load on the plants' radwaste systems.

Each of these valves has been disassembled and inspected in the past and they have not displayed any indication of degradation that would impede their capability to perform their safety function to open. These valves are identical with the same manufacturer, size, model designation, orientation and service conditions.

Note that these valves remain closed in a benign medium under all but accident conditions and see no actual operation, thus service related failure is unlikely.

ALTERNATE TESTING

During each reactor refueling outage at least one of these valves will be disassembled, inspected and manually exercised on a sequential and rotating schedule. If, in the course of this inspection a valve is found to be inoperable with respect to its function to fully open, then the other valve will be inspected during the same outage. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods and final close-out inspections.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and agrees with related comments and recommendations in NUREG-1482, Appendix A.

APPENDIX B
REQUESTS FOR RELIEF - VALVES

RELIEF REQUEST NO. VR-17

SYSTEM

Containment Spray (2998-G-088 Sh 2; 8770-G-088, Sh 2)

COMPONENTS

V07192
V07193

CATEGORY

C

FUNCTION

These check valves open to provide flowpaths from the containment spray pumps to the containment spray headers in containment. They close to isolate the containment spray system from the containment atmosphere and thus prevent gross leakage in the event of a passive failure outside the containment building.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-17
(continued)

BASIS FOR RELIEF

These are simple swing check valves with no external means of exercising or determining obturator position. Exercising to the open position with system flow would require operating each containment spray pump at nominal accident flowrate. Since no recirculation flowpath exists downstream of these valves, flow would necessarily be directed into the containment spray headers with the undesirable result of dousing personnel and equipment in the containment with radioactive contaminated borated water. Such a test is obviously impractical. Closure testing of the valves could only be performed by a back-leakage test. This is also impractical since back pressure cannot be applied to the valves due to the multiple open spray nozzles downstream of the vales. Due to their location inside containment and associated access difficulties, disassembly and inspection can only be performed during extended unit outages (refueling). Partial-flow testing using compressed air is possible but requires draining the entire containment spray discharge header. The partial-stroke air flow test for determining valve operability is only warranted after the headers have been drained following valve disassembly and inspection. /R4

Currently, and for the last eight years, these valves have been disassembled and inspected during each refueling on an alternating schedule in accordance with NRC Generic Letter 89-04 - one valve each unit outage. Although it is possible to continue this activity, it has proven to be an extreme burden, potential personnel safety hazard, and undue hardship on the plant staff where the cost in plant resources to perform the inspections is not commensurate with any potential gain in plant safety derived from these inspections.

Each of these valves is located within the containment building in a horizontal run of pipe immediately upstream of the respective containment spray header at an elevation of approximately 148'. This is approximately 86 feet above the containment building operating deck. Since there is no permanent means of access to these valves (e.g., decking, grating, ladders), in order to gain access to each valve, the containment polar crane must be parked and locked in position below the subject valve and a scaffold approximately 25 feet high must be erected resting on the crane girders. Note that the working surface at the crane girders is approximately 60 feet above the operating deck. Working under these conditions poses significant safety concerns to labor and inspection crews during scaffold erection and disassembly as well as valve disassembly and inspection activities. Furthermore, the total cost in resources to perform this evolution, including scaffolding and inspection activities, is typically 75-80 man-hours.

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RELIEF REQUEST NO. VR-17
(continued)

BASIS FOR RELIEF (continued)

The containment building polar crane is typically a critical element with respect to the overall refueling outage schedule and duration. During the period of time that the scaffolding is being erected, installed, or being disassembled and removed the polar crane must be locked in place and disabled. Because of this, disassembly and inspection of these valves has a high probability of negatively impacting the unit outage with a potential for extending the outage duration without a commensurate increase is safety.

These valve normally remain idle in a dry condition with no mechanism, environmental or otherwise, that could damage a valve or cause any significant inservice deterioration. Indeed, the most probable cause of failure, albeit small, is probably related to the potential personnel error associated with the repeated unnecessary disassembly and re-assembly activities. Since the inspection effort has been in effect, each of these valves has been inspected several times and each time, no significant degradation or deterioration has been noted. The inspection history of these valves is provided below. Based on the results of the past inspections, it is clear that these valves are not subject to deterioration. In addition, an exhaustive search of the INPO NPRDS database indicates that there have been no relevant service failures of similar valves subject to similar operating conditions and environment.

Table: Test/Inspection Summary

UNIT 1				UNIT 2		
VALVE	INSP. DATE	RESULTS		VALVE	INSP. DATE	RESULTS
V07192	11/91	SAT		V07192	11/90	SAT
	11/94	SAT			3/94	SAT
	11/97	SAT			5/97	SAT
V07193	4/93	SAT		V07193	8/92	SAT
	6/96	SAT			11/95	SAT

APPENDIX B

REQUESTS FOR RELIEF - VALVES

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RELIEF REQUEST NO. VR-17

(continued)

BASIS FOR RELIEF (continued)

These valves open to provide flowpaths to the respective containment spray headers in order to limit containment pressure in the unlikely event of a loss of coolant accident. They have no safety significance with respect to core melt probability and thus, per St. Lucie probabiliatic analysis, are considered to be low safety significant components.

Each of these valves is identical with respect to design, manufacturer, model number, service conditions and valve orientation. By inspecting one valve every other unit refueling, effectively combining the valves from both units into a single inspection group, inspection of each valve will be performed nominally every six (6) years which is in compliance with the precepts presented in NRC Generic Letter 89-04, Position 2. In this regard, this request for relief satisfies the requirements as stated in GL 89-04 and thus should be considered "pre-approved".

Based on the foregoing discussion, it is clear that the continued disassembly and inspection of these valves on the alternating schedule for each unit imposed by a simple interpretation of NRC Generic Letter 89-04 is unwarranted. Little value, with respect to plant safety, is gained by these efforts while the cost in terms of plant resources, plant downtime, and personnel safety concerns is great. It is also clear that continued inspections of these valves at the proposed frequency will adequately ensure the continued operability of these valves and ensure the health and safety of the public while providing the plant staff some relief from this unnecessary burden.

ALTERNATE TESTING

One of these valves in each unit will be disassembled and inspected every other unit outage. Partial-flow exercising will be performed on each valve following disassembly and inspection. Successive inspections will be performed in a defined sequence such that inspections are performed in each unit on an alternating basis. /R4

In the event that a valve is found to be inoperable, whereby it could not perform its intended function to open, the other valve in that unit will be similarly disassembled and inspected prior to startup of that unit. In addition, prior to the end of the next refueling outage of the other unit, both check valves in that unit will likewise be disassembled and inspected.

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RELIEF REQUEST NO. VR-18

SYSTEM

Emerg. Diesel Generator Systems (2998-G-096 Sh 1C&2C; 8770-G-096 Sh 1C & 2C)

COMPONENTS

Unit 1:

FCV-59-1A1	FCV-59-1B1	SE-59-3A	SE-59-3B	V59200
FCV-59-2A1	FCV-59-2B1	SE-59-4A	SE-59-4B	V59201
FCV-59-3A1	FCV-59-3B1	SE-59-5A	SE-59-5B	V59202
FCV-59-4A1	FCV-59-4B1	SE-59-6A	SE-59-6B	V59203

Unit 2:

FCV-59-1A1	FCV-59-1B1	SE-59-3A	SE-59-3B
FCV-59-2A1	FCV-59-2B1	SE-59-4A	SE-59-4B
FCV-59-3A1	FCV-59-3B1	SE-59-5A	SE-59-5B
FCV-59-4A1	FCV-59-4B1	SE-59-6A	SE-59-6B
V59183	V59193	V59231	V59241
V59187	V59197	V59235	V59245
V59191	V59198	V59239	V59246
V59192	V59199	V59240	V59247

CATEGORY

B & C

FUNCTION

These valves operate as required to energize and to engage/disengage the emergency diesel generator air start motors.

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REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-18
(continued)

PART 10 REQUIREMENT

Active category A and B valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.2.1.2, 4.2.1.5 and 4.3.2.7. (Paragraph 4.2.1)

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

BASIS FOR RELIEF

> **NOTE**
> The diesel fuel oil and air start systems were optionally upgraded to Class 3 and thus, testing is optional per ASME B&PV Code, Section XI, Paragraph IWA-1320(e). Consequently, this relief request is provided for information only and approval is not required.

These valves are associated with the four (redundant) air start motors related to the respective emergency diesel generators. There are no external position indicators or other convenient means of verifying operation other than evaluating their performance during diesel engine start. Due to the redundant design, individually testing each of these valves requires isolation of the component then proving that the diesel generators successfully start and operate properly. Performing such testing on a quarterly basis is not consistent with the St. Lucie EDG Testing Program and, based on current testing philosophy, is not considered to be required to ensure EDG availability.

ALTERNATE TESTING

At least once every two (2) years these valves will be tested, as appropriate, in conjunction with the EDG comprehensive testing program.

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RELIEF REQUEST NO. VR-19

SYSTEM

Heating, Ventilation and Air Conditioning (2998-G-878; 8770-G-878)

COMPONENTS

V-25-20
V-25-21

CATEGORY

AC

FUNCTION

These valves open as required to limit containment internal vacuum and close for containment isolation.

PART 10 REQUIREMENT

1. Within every 6 month period operability tests shall be performed unless historical data indicates a requirement for more frequent testing.

2. Leak tests shall be performed every 2 years unless historical data indicates a requirement for more frequent testing.

BASIS FOR RELIEF

These check valves are tested in such a way that immediate access to each valve is required. Since these valves are located inside the primary containment building, routine access during power operation is considered to be impractical. At 100% power, the dose rates on 62' reactor containment building in the vicinity of the vacuum relief valves are 42 mrem/hour gamma and 300 mrem/hour neutron. These dose rates are documented at floor level and the vacuum relief valves are located 11 feet off the floor at the 73' elevation. The source of radiation streaming in this area is the gap between the 6 foot high bio-wall and the reactor head missile shield which would suggest that dose rates would be slightly higher at the actual vacuum relief valve location. Thus, operational testing can only be performed during cold shutdown conditions.

APPENDIX B
REQUESTS FOR RELIEF - VALVES
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RELIEF REQUEST NO. VR-19
(continued)

BASIS FOR RELIEF (continued)

Leakrate testing of these valves is performed in accordance with the St. Lucie Containment Leakage Rate Testing Program (Technical Specification, Paragraph 6.8.4 h.). This Program allows extension of leakrate testing beyond the 2-year interval based on 10 CFR 50 Appendix J, Option B. There is no overriding justification nor engineering issue that demands more frequent testing than that required by Appendix J and the St. Lucie Containment Leakrate Testing Program.

ALTERNATE TESTING

Each of these valves will be subjected to an operability test (opened and closed) during plant cold shutdown periods. Testing during cold shutdowns will be on a frequency determined by intervals between shutdowns as follows:

- For cold shutdown periods occurring at intervals of 6 months or longer - each shutdown.
- For cold shutdown periods occurring at intervals of less than 6 months - testing is not required unless 6 months have passed since the last cold shutdown test.

Cold shutdown testing of pumps and valves will commence within 48 hours of entering cold shutdown and continue until testing of all pumps and valves designated for cold shutdown testing during the outage is complete or the unit is ready to return to power. For extended outages, testing need not be commenced within 48 hours provided all required testing is completed prior to startup. If pump and valve testing is not begun within the 48-hour period then both of these valves will be tested prior to startup. Where plant conditions or other circumstances arise that preclude testing of a valve, a unit will not be retained in Mode 3 for the sole purpose of completing testing.

Leakrate testing will be performed on a schedule as set forth in the St. Lucie Containment Isolation Valve Leakrate Testing Program.

/R4

APPENDIX B

REQUESTS FOR RELIEF - VALVES

(Page 40 of 41)

RELIEF REQUEST NO. VR-21

SYSTEM

Safety Injection System (2998-G-078, Sh 130A)

COMPONENTS

V3102
V3103

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the high pressure safety injection pumps to the Refueling Water Tank (RWT) to provide for minimum flow through the respective pump in the event if is operating under low or no flow conditions.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4., and 4.3.2.5. (Paragraph 4.3.2)

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used. (Paragraph 4.3.2.4(c))

BASIS FOR RELIEF

These are simple check valves with no external means of exercising nor determining obturator position. Consequently, the only practical method for determining disk position (open) is by performing a pump flowrate test. Full stroke capability must be verified, per Generic Letter 89-04, Position 1, by attaining the maximum accident flow through each valve. There is no installed flow measuring instrument available with which this determination can be made.

APPENDIX B
REQUESTS FOR RELIEF - VALVES
(Page 41 of 41)

RELIEF REQUEST NO. VR-21
(continued)

BASIS FOR RELIEF (continued)

Non-intrusive verification of full-stroke operation is not practical since the system is provided with permanently installed orifices that restrict flow to a quantity less than that required to fully open the valves.

The associated high pressure safety injection pumps are normally idle in standby status and are operated only during test periods, thus valves see little service and service-related failures are unlikely.

These valves are identical with the same manufacturer, size, model designation, orientation, and service conditions.

ALTERNATE TESTING

During quarterly pump testing each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits with no flow measurements.

During each reactor refueling outage, at least one of these valves will be disassembled, inspected, and manually stroked to verify operability. Should a valve under inspection be found to be inoperable, then the other valve will be inspected during the same outage, after which the rotational inspection schedule will be retained. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods, and final close-out inspections.

Following reassembly, each valve will be partial-flow exercised open and tested closed to verify operability.

This alternate testing agrees with the guidelines of NRC Generic Letter 89-04, Position 2 and with related comments and recommendations in NUREG-1482, Appendix A.

/R4

END OF APPENDIX B

APPENDIX C
REFUELING JUSTIFICATIONS

REFUELING INTERVAL TESTING

ASME/ANSI OM-Code, Part 10, Paragraphs 4.2.1.2 and 4.3.2.2 allow deferral of testing of certain valves to refueling where completion of the Code-required testing during plant power operation or cold shutdown periods is not practicable. NUREG-1482, Guidelines For Inservice Testing At Nuclear Power Plants, Chapter 3, gives further guidance for determining when test deferral is appropriate and the basis for justifying deferral. This appendix provides those test justifications for the instances at St. Lucie where test deferral to refueling is necessary. Each justification is based on the OM-Code and relevant portions of NUREG-1482.

APPENDIX C
REFUELING JUSTIFICATIONS
(Page 2 of 37)

REFUELING JUSTIFICATION NO. RFJ-01

SYSTEM

Chemical and Volume Control (8770-G-078, Sh 120B)

COMPONENTS

V2430
V2431

CATEGORY

C

FUNCTION

These check valves open to provide a flowpath for boron injection to the reactor coolant system and the pressurizer auxiliary spray. They are required to pass flow when a HPSI pump is utilized for hot leg injection. (FUSAR Appendix 6C.2) These valves are not required to close or to provide containment isolation because charging is considered to be in operation during a LOCA.

DISCUSSION

In order to test these valves, wither SE-02-03 or SE-02-04 must be opened. Opening either of these valves (or failure in the open position) during plant operation would cause an RCS pressure transient that could potentially adversely affect plant safety and lead to plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to undesirable thermal shock. Further, a HPSI pump must be used to develop the required flow. For this to occur, the vent paths must be available to satisfy Low Temperature Over Pressure concerns.

APPENDIX C
REFUELING JUSTIFICATIONS

REFUELING JUSTIFICATION NO. RFJ-01
(continued)

ALTERNATE TESTING

Check valve V2430 will be part stroke exercised quarterly per Part 10 Paragraphs 4.3.2.2(d) and (g).

Check valve V2431 will be part stroke exercised during each cold shutdown per Part 10 Paragraphs 4.3.2.2(b).

During each refueling outage these valves will be full stroked. This is consistent with the guidelines presented in Generic Letter 89-04 Position 1.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-02

SYSTEM

Chemical and Volume Control (2998-G-078, Sh 121 A&B; 8770-G-078, Sh 121 A&B)

COMPONENTS

V2177
V2190
V2191
V2443
V2444
V2526 (Unit 2 only)

CATEGORY

C

FUNCTION

V2177 opens to provide a flowpath for emergency boration from the boric acid makeup (BAM) pumps to the suction of the charging pumps.

V2190 opens to provide a flowpath for emergency boration via gravity drain from the boric acid makeup tanks to the suction of the charging pumps.

V2191 opens to provide a flowpath from the Refueling Water Tank (RWT) to the suction of the charging pumps as an alternate supply of borated water for emergency boration.

V2443 and V2444 open to provide flowpaths from the BAM pumps to the charging pump suction header for emergency boration.

In Unit 2, V2526 is an additional check valve leading from the boric acid tanks and pumps to the charging pump suction header that must open for emergency boration.

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REFUELING JUSTIFICATIONS
(Page 5 of 37)

REFUELING JUSTIFICATION NO. RFJ-02
(continued)

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. Since there is no convenient recirculation flowpath capable of full-flow (120 gpm) the only practical flowpath is into the RCS via three charging pumps. Injection into the RCS results in the introduction of highly concentrated boric acid solution from the boric acid makeup tanks to the suction of the charging pumps and thence to the RCS. This would result in the addition of excess boron to the RCS. The rapid insertion of negative reactivity would result in an RCS cooldown and de-pressurization which, given a large enough boron addition, could result in an unscheduled plant trip and a possible safety injection system initiation. Except for BAM Pump Discharge Check Valves, V2443 and V2444, partial-stroke exercising presents the same problems with respect to boron injection as does full-stroke exercising. V2443 and V2444 can be exercised by recirculating to the BAM tanks, however, there is no flow instrumentation available to verify full-stroking of these valves.

During cold shutdown, the introduction of excess quantities of boric acid into the RCS is undesirable from the aspect of maintaining proper plant chemistry and the inherent difficulties that may be encountered during the subsequent startup due to over-boration of the RCS. The waste management system would also be overburdened by the large amounts of RCS coolant that would require processing to decrease the boron concentration at startup. Since the boron concentration is normally increased to a limited extent for shutdown margin prior to reaching cold shutdown, a part stroke exercise of these valves could be performed at that time.

ALTERNATE TESTING

Each of these check valves, except for V2443 and V2444, will be part stroke exercised during each cold shutdown per Part 10, Paragraphs 4.3.2.2(d) and (g).

Valves V2443 and V2444 will be part stroke exercised quarterly.

Each of these check valves will be full-stroke exercised during each reactor refueling outage.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-03

SYSTEM

Safety Injection System (2998-G-078, Sh 130A; 8770-G-078, Sh 130A)

COMPONENTS

V3101
V3103

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the high-pressure safety injection pumps to the refueling water tank (RWT) to provide for minimum flow through the respective pumps in the event they are operating under low or no flow conditions.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. There is no flowrate instrumentation available in the respective lines to verify valve full stroke exercising as defined by Generic Letter 89-04, Position 1.

During refueling, these valves can be full flow tested and the flowrates determined. The flowpath for this test is from the refueling cavity to the RWT via the HPSI pump mini-flow recirculation line. The flowrate can be calculated by determining the increase in RWT volume over a measured period of time. Since this test procedure reduces RCS inventory it can only be performed during refueling outages with the reactor head removed, permitting refueling cavity water inventory to be pumped to the RWT.

ALTERNATE TESTING

During quarterly pump testing each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits with no flow measurements.

During each reactor refueling outage each of these valves will be full-flow tested.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-04

SYSTEM

Safety Injection (2998-G-078, Sh 130A; 8770-G-078, Sh 130A)

COMPONENTS

V3401
V3410

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the refueling water tanks (RWTs) and the containment sumps to the suction of the associated high-pressure safety injection (HPSI) pumps.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. The only flowpath available during normal power operation is recirculating RWT water via the HPSI mini-flow line that results in only partial-stroke exercising. Full stroke exercising of these valves to the open position requires injection into the RCS via the HPSI pumps. During plant operation this is precluded because the HPSI pumps can not develop sufficient discharge pressure to overcome primary system pressure. At cold shutdown, there are several issues that make exercising impractical, including:

1. There is no available reservoir in the reactor coolant system to accept the injected water and the shutdown cooling system can not provide sufficient letdown flow back to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function;

REFUELING JUSTIFICATION NO. RFJ-04
(continued)

DISCUSSION (continued)

2. The excessive quantities of boric acid injected during such testing would seriously hamper the ensuing startup; and

3. During cold shutdown conditions, operation of the HPSI pumps is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits specified in the St. Lucie Technical Specifications, Section 3.4.9.

   Therefore, the only practical opportunity for full-flow testing these valves is during refueling outages when water from the RWT is used to fill the refueling cavity.

ALTERNATE TESTING

These valves will be partial-flow exercised during quarterly testing of the HPSI pumps via the minimum flow circuit and full-flow exercised during each reactor refueling outage.

REFUELING JUSTIFICATION NO. RFJ-05

SYSTEM

Safety Injection (2998-G-078, Sh 130A; 8770-G-078, Sh 130A)

COMPONENTS

V3414
V3427

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the respective HPSI pumps to the high-pressure safety injection headers. They close to prevent recirculation through an idle pump.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. Full stroke exercising of these valves to the open position requires injection into the RCS via the HPSI pumps. During plant operation this is precluded because the HPSI pumps can not develop sufficient discharge pressure to overcome primary system pressure. At cold shutdown, there are several issues that make full open exercising impractical, including: /R4

1. There is no available reservoir in the reactor coolant system to accept the injected water and the shutdown cooling system can not provide sufficient letdown flow back to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function;

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-05
(continued)

DISCUSSION (continued)

2. The excessive quantities of boric acid injected during such testing would seriously hamper the ensuing startup; and

3. During cold shutdown conditions, operation of the HPSI pumps is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits (LTOP) specified in the St. Lucie Technical Specifications, Section 3.4.9.

Partial flow exercising of these valves is performed whenever its associated HPSI pump is used to refill an SIT. The acceptable SIT level and pressure bands specified by the Technical Specifications are very narrow and the SITs are only refilled on an as-needed basis; therefore, the partial flow test can not readily be incorporated into a periodic test. Alternate flowpaths for partial flow tests are limited by the design pressure of the associated piping.

Recirculating water to the RWT through containment penetration P-41 can also perform partial flow testing of these valves. This evolution is normally performed following cold shutdown outages to ensure the boron concentration in the headers is maintained at concentrations required for safety injection. This method requires that the containment isolation valves, one of them a manual isolation on Unit 1, and both manual isolations on Unit 2, be opened to complete the flowpath. This lineup breaches containment integrity, as defined in Technical Specifications 3.6.1.1, and therefore can only be aligned infrequently under strict administrative controls. Routine quarterly use of this flowpath violates the intent of these controls and thus is precluded in Modes 1, 2, 3, and 4. /R4

ALTERNATE TESTING

These valves will be part-stroke exercised open while refilling an SIT. The SIT tanks will only be refilled as required to maintain them within the Technical Specification limits. An SIT will not necessarily be filled for the sole purpose of part-stroke exercising any one of these check valves.

Each of these valves will be verified closed quarterly, part-stroke exercised during each cold shutdown per Part 10, Paragraphs 4.3.2.2(d) and (g), and full-stroke exercised (open) during each reactor refueling outage.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-06

SYSTEM

Safety Injection (2998-G-078, Sh 130B; 8770-G-078, Sh 130B)

COMPONENTS

V07000
V07001

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the refueling water tanks (RWTs) to the suction of the associated low-pressure safety injection pumps.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. The only flowpath available during normal power operation is recirculating RWT water via the LPSI mini-flow line that results in only partial-stroke exercising. Full stroke exercising of these valves to the open position requires injection into the RCS via the LPSI pumps. During plant operation this is precluded because the LPSI pumps can not develop sufficient discharge pressure to overcome primary system pressure. At cold shutdown, there is no available reservoir in the reactor coolant system to accept the injected water and the shutdown cooling system can not provide sufficient letdown flow back to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function. Also, the excessive quantities of boric acid injected during such testing would seriously hamper the ensuing startup. Therefore, the only practical opportunity for full-flow testing these valves is during refueling outages when water from the RWT is used to fill the refueling cavity.

ALTERNATE TESTING

These valves will be partial-flow exercised during quarterly testing of the LPSI pumps via the minimum flow circuit and full-flow exercised during each reactor refueling outage.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-07

SYSTEM

Safety Injection System (2998-G-078, Sh 130B; 8770-G-078, Sh 130B)

COMPONENTS

V3104
V3105

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the low-pressure safety injection pumps to the refueling water tanks (RWTs) to provide for minimum flow through the respective pumps in the event they are operating under low or no flow conditions. They close during shutdown cooling and long-term recirculation to prevent recirculation through idle pump(s).

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. There is no flowrate instrumentation available in the respective minimum flow lines to verify valve full stroke exercising as defined by Generic Letter 89-04, Position 1. Due to the installation of flow orifices in these lines, the maximum flow velocity achievable is approximately 10 ft/sec. which is considerably less than the 32.8 ft/sec. needed to fully open the valves. For this reason the use of non-intrusive techniques for verifying valve operability is impractical.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-07
(continued)

DISCUSSION (continued)

During refueling these valves can be full-flow tested and the flowrates determined. The flowpath for this test is from the refueling cavity to the RWT via the LPSI pump mini-flow recirculation line. The flowrate can be calculated by determining the increase in RWT volume over a measured period of time. Since this test procedure reduces RCS inventory it can only be performed during refueling outages with the reactor head removed, permitting refueling cavity water inventory to be pumped to the RWT.

ALTERNATE TESTING

During quarterly pump testing each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits with no flow measurements.

During each reactor refueling outage each of these valves will be full-flow tested.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-08

SYSTEM

Safety Injection (2998-G-078, Sh 131; 8770-G-078, Sh 131A)

COMPONENTS

V3113
V3123 (Unit 1 only)
V3133
V3143
V3766 (Unit 2 only)

CATEGORY

A/C

FUNCTION

These valves open to provide flowpaths from the high-pressure safety injection headers to the RCS and close to isolate the headers from the high pressure of the reactor coolant system.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position, thus, testing these valves in the open direction requires system flow. Full stroke exercising of these valves to the open position requires injection into the RCS via the HPSI pumps. During plant operation this is precluded because the HPSI pumps can not develop sufficient discharge pressure to overcome primary system pressure. At cold shutdown, there are several issues that make full flow exercising impractical, including: /R4

1. There is no available reservoir in the reactor coolant system to accept the injected water and the shutdown cooling system can not provide sufficient letdown flow back to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function;

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-08
(continued)

DISCUSSION (continued)

2. The excessive quantities of boric acid injected during such testing would seriously hamper the ensuing startup; and

3. During cold shutdown conditions, operation of the HPSI pumps is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits (LTOP) specified in the St. Lucie Technical Specifications, Section 3.4.9.

Partial flow exercising of these valves is performed whenever its associated HPSI pump is used to refill an SIT. The acceptable SIT level and pressure bands specified by the Technical Specifications are very narrow and the SITs are only refilled on an as-needed basis; therefore, the partial flow test can not readily be incorporated into a periodic test. Alternate flow paths for partial flow tests are limited by the design pressure of the associated piping.

Recirculating water to the RWT through containment penetration P-41 can also perform partial flow testing of these valves. This evolution is normally performed following cold shutdown outages to ensure the boron concentration in the headers is maintained at concentrations required for safety injection. This method requires that the containment isolation valves, one of them a manual isolation on Unit 1, and both manual isolations on Unit 2, be opened to complete the flowpath. This lineup breaches containment integrity, as defined in Technical Specifications 3.6.1.1, and therefore can only be aligned infrequently under strict administrative controls. Routine quarterly use of this flowpath violates the intent of these controls and thus is precluded in Modes 1, 2, 3, and 4. /R4

ALTERNATE TESTING

These valves will be part-stroke exercised open while refilling an SIT. The SIT tanks will only be refilled as required to maintain them within the Technical Specification limits. No SIT will be filled for the sole purpose of part-stroke exercising any one of these check valves.

Each of these valves will be full-stroke exercised (open) during each reactor refueling outage.

REFUELING JUSTIFICATION NO. RFJ-09

SYSTEM

Safety Injection (2998-G-078, Sh 130A)

COMPONENTS

V3522
V3547

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the respective HPSI pumps to the hot leg injection headers. Should the normal charging header become disabled, V3547 is required to close to direct charging flow to the RCS via the 2A HPSI header. /R4

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. Full stroke exercising of these valves to the open position requires injection into the RCS via the HPSI pumps. During plant operation this is precluded because the HPSI pumps can not develop sufficient discharge pressure to overcome primary system pressure. At cold shutdown, there are several issues that make full open exercising impractical, including: /R4

1. There is no available reservoir in the reactor coolant system to accept the injected water and the shutdown cooling system can not provide sufficient letdown flow back to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function;

2. The excessive quantities of boric acid injected during such testing would seriously hamper the ensuing startup; and

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-09
(continued)

DISCUSSION (continued)

3. During cold shutdown conditions, operation of the HPSI pumps is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits (LTOP) specified in the St. Lucie Technical Specifications, Section 3.4.9.

Recirculating water to the RWT through containment penetration P-41 can also perform partial flow testing of these valves. This evolution is normally performed following cold shutdown outages to ensure the boron concentration in the headers is maintained at concentrations required for safety injection. This method requires that the containment isolation valves, one of them a manual isolation on Unit 1, and both manual isolations on Unit 2, be opened to complete the flowpath. This lineup breaches containment integrity, as defined in Technical Specifications 3.6.1.1, and therefore can only be aligned infrequently under strict administrative controls. Routine quarterly use of this flowpath violates the intent of these controls and thus is precluded in Modes 1, 2, 3, and 4.

Closure testing of V3547 requires charging pumps to be aligned to the 2A HPSI header and a seat leakage test performed to verify valve closure. This is undesirable during normal plant operation since the lineup will direct water of lower boron concentration than that required for safety injection reactivity control into the HPSI header. Also, there is the potential that the higher pressure from the charging system could inadvertently cause injection of the higher boron concentrated water from the HPSI header into the RCS undesirably affecting reactivity and reactor power. Performance of this testing requires isolation of the HPSI pump discharge and installation of leak measuring equipment. NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to setup test equipment is adequate justification to defer backflow testing until a refueling outage...". Therefore, based on this guidance FPL considers closure testing during of this valve during cold shutdown as well as normal operation to not be practicable.

ALTERNATE TESTING

Each of these check valves will be part stroke exercised during each cold shutdown per Part 10, Paragraphs 4.3.2.2(d) and (g) and full stroke exercised during each reactor refueling outage. V3547 will be verified closed each refueling outage.

/R4

REFUELING JUSTIFICATION NO. RFJ-10

SYSTEM

Safety Injection (2998-G-078, Sh 131)

COMPONENTS

V3524
V3525
V3526
V3527

FUNCTION

These valves open to provide flowpaths from the high-pressure safety injection (HPSI) pumps to the RCS for hot leg injection and close to isolate the safety injection headers from the high pressure of the reactor coolant system.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position, thus, testing these valves in the open direction requires system flow. Full stroke exercising of these valves would require operating a high pressure safety injection (HPSI) pump at nominal accident flowrate and injecting into the reactor coolant system. At power operation this is not possible because the HPSI pumps can not develop sufficient discharge pressure to overcome reactor coolant system pressure. During cold shutdown conditions, full flow operation of the HPSI pumps is restricted to preclude RCS system pressure transients that could result in exceeding the pressure-temperature limits specified in the Technical Specifications, Section 3.4.9.

Partial flow testing of V3525 and V3527 during normal operation cannot be performed since the only flow path is to the higher pressure RCS. /R4

APPENDIX C
REFUELING JUSTIFICATIONS
(Page 19 of 37)

REFUELING JUSTIFICATION NO. RFJ-10
(continued)

DISCUSSION (continued)

Partial flow testing of V3524 and V3526 can be performed by recirculating water to the RWT through containment penetration P-41. This evolution is normally performed following cold shutdown outages to ensure the boron concentration in the headers is maintained at concentration required for safety injection. This method requires that the containment isolation valves, one of them a manual isolation on Unit 1, and both manual isolations on Unit 2, be opened to complete the flowpath. This lineup breaches containment integrity, as defined in Technical Specifications 3.6.1.1, and therefore can only be aligned infrequently under strict administrative controls. Routine quarterly use of this flowpath violates the intent of these controls and thus is precluded in Modes 1, 2, 3, and 4. /R4

ALTERNATE TESTING

Each of these check valves will be part stroke exercised during each cold shutdown per Part 10, Paragraphs 4.3.2.2(d) and (g) and full stroke exercised during each reactor refueling outage.

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-11

SYSTEM

Condensate and Feedwater (8770-G-080, Sh. 4)

COMPONENT

V09303

CATEGORY

C

FUNCTION

This valve opens to provide a flowpath from Auxiliary Feedwater Pump 1A discharge to the condensate storage tank (CST) to ensure adequate pump cooling during low flow conditions.

PART 10 REQUIREMENT

As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used.
(Paragraph 4.3.2.4(c))

DISCUSSION

This is a simple check valve with no external means of exercising or for determining obturator position, thus, testing it in the open direction requires system flow. There is no flowrate instrumentation available to verify valve full-stroke exercising of this valve as required by Generic Letter 89-04, Position 1.

Note that this valve is significantly different from the other two pump recirculation valves and, thus, it is called out for individual inspection and not included in the other group of valves.

ALTERNATE TESTING

During each reactor refueling outage this valve will be disassembled, inspected and manually stroked to verify operability. This is consistent and in compliance with Part 10, Paragraph 4.3.2.4(c).

REFUELING JUSTIFICATION NO. RFJ-12

SYSTEM

Condensate and Feedwater (2998-G-080, Sh. 2B)

COMPONENT

V12806

CATEGORY

C

FUNCTION

This check valve opens to provide a flowpath from the Unit 2 Condensate Storage Tank (CST) to the suction of Unit 1 auxiliary feedwater pumps in the event of storm damage to the unprotected Unit 1 Condensate Storage Tank.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

DISCUSSION

This is a simple check valve with no external means of exercising or for determining obturator position, thus, testing it in the open direction requires system flow. Cycling this valve is unacceptable during plant operation as it would jeopardize the Unit 1 and Unit 2 Auxiliary Feedwater Pumps when performing a flow test. To pass flow through this valve requires aligning the pumps' suction piping to the non-classed and non-seismic cross connect piping and components. Thus, a credible single failure of the non-classed piping could disable all (both units) auxiliary feedwater pumps. Cycling of this valve during Unit 2 shutdowns is not practicable since it would require Unit 1 also be shut down to perform the testing.

ALTERNATE TESTING

During each Unit 1 reactor refueling outage this valve will be full-stroke exercised.

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REFUELING JUSTIFICATION NO. RFJ-13

SYSTEM

Feedwater System (8770-G-080, Sh 4)

COMPONENTS

V12507

CATEGORY

C

FUNCTION

This valve opens to provide a discharge flowpath for bearing cooling water from steam-driven Auxiliary Feedwater Pump 1C.

PART 10 REQUIREMENT

Check valves shall be exercised nominally every 3 months, except as provided by Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5. (Paragraph 4.3.2)

DISCUSSION

This is a simple check valve with no external means of exercising or for determining obturator position, thus, testing it in the open direction requires system flow. There is no flowrate instrumentation available to verify valve full-stroke exercising of this valve as required by Generic Letter 89-04, Position 1.

ALTERNATE TESTING

During each reactor refueling outage this valve will be disassembled, inspected and manually stroked to verify operability. This is consistent and in compliance with Part 10, Paragraph 4.3.2.4(c).

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REFUELING JUSTIFICATION NO. RFJ-14

SYSTEM

Make-up Water (2998-G-084, Sh 1; 8770-G-084, Sh 1C)

COMPONENTS

V15328

CATEGORY

A/C

FUNCTION

This valve closes to provide primary containment for the penetration related to the primary water supply line to the containment building.

DISCUSSION

This is a simple check valve with no external means of exercising or for determining obturator position, thus the only practical means of verifying closure is by performing a leak test or backflow test. This would require a considerable effort, including entry into the containment building. Due to access, this is impractical during plant operation and would be an unreasonable burden on the plant staff to perform during cold shutdowns.

ALTERNATE TESTING

During each refueling outage this valve will be verified to close. This is consistent with the guidelines provided in NUREG-1482, Paragraph 4.1.4.

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REFUELING JUSTIFICATION NO. RFJ-15

SYSTEM

Instrument Air (2998-G-085, Sh 2A; 8770-G-085, Sh 2A)

COMPONENTS

V18195

CATEGORY

A/C

FUNCTION

This valve closes to provide primary containment for the penetration related to the instrument air supply line to the containment building.

DISCUSSION

This is a simple check valve with no external means of exercising or for determining obturator position, thus the only practical means of verifying closure is by performing a leak test or backflow test. This would require a considerable effort, including entry into the containment building and securing all instrument air to the containment. Due to access limitations and the undesirability of isolating the air supply for critical equipment, this is impractical during plant operation and would be an unreasonable burden on the plant staff to perform during cold shutdowns.

ALTERNATE TESTING

During each refueling outage this valve will be verified to close.

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REFUELING JUSTIFICATION NO. RFJ-16

SYSTEM

Containment Spray (2998-G-088, Sh 1; 8770-G-088, Sh 1)

COMPONENTS

V07129
V07143

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the respective containment spray pump to the containment spray headers.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. Full-stroke exercising of these valves would require operating each containment spray pump at nominal accident flowrate. Since exercising these valves through the normal containment spray flowpath would result in spraying down the containment, the only practical flowpath available for such a test requires pumping water from the refueling water tank (RWT) to the RCS via the shutdown cooling loops. At cold shutdown, the shutdown cooling system can not provide sufficient letdown flow to the RWT to accommodate full design flow from the RWT while maintaining the necessary core cooling function.

ALTERNATE TESTING

Each of these valves will be partial-stroke exercised quarterly in conjunction with testing of the containment spray pumps via the minimum flow test line.

During each refueling outage, each valve will be exercised at least once to demonstrated full stroke capability.

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REFUELING JUSTIFICATION NO. RFJ-17

SYSTEM

Containment Spray (8770-G-088, Sh 1)

COMPONENTS

V07256
V07258

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the spray additive tank to the respective containment spray pump suction header via the containment spray eductors. They close to prevent reverse flow and recirculation through the educator leading to an idle containment spray pump.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position, thus, testing these valves in the open direction requires system flow. Testing these valves during normal plant operation in conjunction with testing of the containment spray pumps would contaminate the containment spray piping with sodium hydroxide. The only practical means of testing these valves requires connection of a source of demineralized water at the tank discharge then directing water into the containment spray piping. Testing these valves open or closed requires removing sodium hydroxide chemical injection capability from both containment spray trains.

In addition to the physical system constraints, frequent performance of the above mentioned testing is undesirable based on the personnel hazards associated with testing. Sodium hydroxide is a dangerous, highly caustic liquid. Testing of the valves either open or closed requires draining of system piping potentially exposing personnel to the caustic fluid. The caustic liquid generated by this testing will also require expensive disposal. For these reasons, it is proposed to perform this testing only during reactor refueling outages.

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REFUELING JUSTIFICATION NO. RFJ-17
(continued)

ALTERNATE TESTING

During each reactor refueling outage both of these valves will be full-stroke exercised (open and closed).

REFUELING JUSTIFICATION NO. RFJ-18

SYSTEM

Containment Spray (2998-G-088, Sh 1)

COMPONENTS

V07256
V07258

CATEGORY

C

FUNCTION

These valves open to provide flowpaths from the hydrazine pumps to the respective containment spray pump suction header. They have no specific safety function in the closed position.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position, thus, testing these valves in the open direction requires system flow. Testing these valves during normal plant power operation in conjunction with testing of the hydrazine pumps would contaminate the containment spray piping with hydrazine. In addition, any mode of testing requires draining significant portions of the containment spray system. This entails a somewhat complex procedure and system re-alignment that is considered outside the scope of work that is typically performed during operations or a routine cold shutdown period, thus, such a test is impractical during periods other than reactor refueling outages.

In addition to the physical system constraints, frequent performance of the above mentioned testing is undesirable based on the personnel hazards associated with testing. Hydrazine is a dangerous, highly flammable liquid with cumulative toxic effects when absorbed through the skin, inhaled or ingested. It has also been identified as a known carcinogen. For this reason, it is proposed to perform this testing only during refueling outages.

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REFUELING JUSTIFICATION NO. RFJ-18
(continued)

ALTERNATE TESTING

During each reactor refueling outage both of these valves will be full-stroke exercised (open).

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REFUELING JUSTIFICATION NO. RFJ-19

SYSTEM

Miscellaneous Sampling (2998-G-092, Sh 1; 8770-G-092, Sh 1)

COMPONENTS

V27101
V27102

CATEGORY

A/C

FUNCTION

These valves open to provide flowpaths for the return from containment hydrogen sampling system - non-safety function. They close to provide primary containment for the related penetrations.

DISCUSSION

These are simple check valves with no external means of exercising or for determining obturator position, thus the only practical means of verifying closure is by performing a leak test or backflow test. This would require a considerable effort, including entry into the containment building and breaking the sampling line connections. This is impractical during plant operation and would be an unreasonable burden on the plant staff to perform at cold shutdown.

ALTERNATE TESTING

During each refueling outage these valves will be verified to close. This is consistent with the guidelines presented in NUREG-1482, Section 4.1.4.

/R4

REFUELING JUSTIFICATION NO. RFJ-22

SYSTEM

Main Steam (8770-G-079, Sh. 1)

COMPONENTS

V08372
V08373

CATEGORY

C

FUNCTION

These check valves open to emit steam to the steam-driven auxiliary feedwater pump during pump startup. They close during a steam leak accident to isolate the unaffected steam generator and prevent the uncontrolled blowdown of both steam generators.

DISCUSSION

These are simple check valves with no external means of exercising or determining obturator position. Verifying closure of these valves during plant operation at normal operating pressures would require isolating the associated steam generator from the steam supply lines and venting the piping between the closed isolation valve and the check valve. It is considered to be imprudent to isolate a steam supply to the AFW pump during operation and, in addition, it is undesirable to subject plant personnel to the hazards associated with venting live steam at these operating conditions. Furthermore, it is likely that testing in this manner would provide inconclusive results.

The backflow testing is performed using compressed air. In order to perform this test a dedicated air compressor is connected to the system via a disassembled check valve - a test that is impractical to perform during cold shutdown periods.

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REFUELING JUSTIFICATION NO. RFJ-22
(continued)

ALTERNATE TESTING

During each reactor refueling outage these valves will be verified to close. This alternate testing satisfies the guidelines of NUREG-1482, Section 3.1.1.4.

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REFUELING JUSTIFICATION NO. RFJ-23

SYSTEM

Feedwater System (8770-G-080, Sh. 4; 2998-G-080 Sh. 2B)

COMPONENTS

Unit 1		Unit 2	
V09824	V09825	V09724	V09725
V09826	V09827	V09726	V09727

CATEGORY

C

FUNCTION

These check valves are located in the chemical feed piping connected to each of the four AFW pump discharge headers. These valves have a non-safety related function to open to provide a chemical feed path to the AFW system thereby maintaining proper system chemistry. These valves also have a safety function to close to isolate the safety related AFW system from the non-safety related chemical feed system.

DISCUSSION

These valves are small 3/8" tubing "Whitey" lift check valves. These valves only have one moving part and do not have any external means of exercising or determining obturator position. No installed plant instrumentation exists to validate or monitor inservice conditions. Due to system configuration and location of test connections, the only method to verify closure would require installation of test equipment. In addition, installation of test equipment requires special precautions and techniques since the contained fluid (hydrazine) is a carcinogenic. Using test equipment, valve closure can be verified by observing backflow (seat leakage), pressure decay or other test method.

/R4

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-23
(continued)

DISCUSSION (continued)

Testing during normal operation or cold shutdown is not practicable. NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to setup test equipment is adequate justification to defer backflow testing until a refueling outage..."

ALTERNATE TESTING

During each reactor refueling outage these valves will be verified to close. This is consistent with OM Part 10, Paragraph 4.2.1.2.(e) and NUREG-1482, Section 4.1.4.

/R4

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REFUELING JUSTIFICATIONS
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REFUELING JUSTIFICATION NO. RFJ-24

SYSTEM

Containment Spray (2998-G-088, Sh. 1)

COMPONENTS

V29431
V29432

CATEGORY

B

FUNCTION

These check valves are located in the nitrogen supply line to the hydrazine storage tank. These valves have a non-safety related function to open to provide a pressurized (~10 psig) nitrogen gas cover in the hydrazine tank. This nitrogen gas cover prevents evaporation of hydrazine into the RAB environment, since hydrazine vapors are carcinogenic, and precludes interaction with oxygen from the atmosphere.

These valves also have a safety function to close to maintain hydrazine tank inventory above Technical Specification limits upon loss of the non-safety related nitrogen supply line.

DISCUSSION

These valves are 1" lift check valves with seal welded bonnets. These valves do not have any external means of exercising or determining obturator position. Plant instrumentation is installed to monitor hydrazine tank nitrogen gas cover pressure and nitrogen gas supply regulator pressure. However, this instrumentation can only be used to monitor performance of the subject check valves as a pair since they are installed in series without intermediate test connections. The only method to verify closure of each check valve individually is to use a non-intrusive technique such as radiography. Performance of radiography requires installation/setup of test equipment and strict coordinations scheduling with operations and maintenance activities for evacuation of the test area.

/R4

APPENDIX C

REFUELING JUSTIFICATIONS

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REFUELING JUSTIFICATION NO. RFJ-24

(continued)

DISCUSSION (continued)

Therefore, testing quarterly during normal operation or cold shutdown is not practicable. NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to setup test equipment is adequate justification to defer backflow testing until a refueling outage..."

ALTERNATE TESTING

During each reactor refueling outage these valves will be verified to close. This is consistent with OM Part 10, Paragraph 4.2.1.2.(e) and NUREG-1482, Section 4.1.4.

/R4

APPENDIX C

REFUELING JUSTIFICATIONS

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REFUELING JUSTIFICATION NO. RFJ-25

SYSTEM

Waste Management (2998-G-078, Sh. 163B; 8770-G-078, Sh. 163B)

COMPONENT

V6779 (Unit 1)
V6792 (Unit 2)

CATEGORY

C

FUNCTION

These check valve open to supply nitrogen to various tanks inside the containment as required during normal operation. It is required to close and to isolate this containment penetration during an accident.

DISCUSSION

Due to system configuration and location of test connections, the only method to verify closure requires installation of test equipment inside containment and performance of a seat leakage test. NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to setup test equipment is adequate justification to defer backflow testing until a refueling outage...". Therefore, based on this guidance FPL considers closure testing during this valve during cold shutdown as well as normal operation to not be practicable.

ALTERNATE TESTING

During each refueling outage these valves will be verified to close. This is consistent with the guidelines presented in NUREG-1482, Section 4.1.4.

/R4

END OF APPENDIX C

APPENDIX D
COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
(Page 1 of 10)

This appendix is intended to provide the justification for performing valve exercising only at cold shutdown conditions as permitted by Part 10, Paragraphs 4.2.1.2 and 4.3.2.2. In addition, the guidance provided in NUREG-1482, Guidelines For Inservice Testing At Nuclear Power Plants was applied for determining that test deferral is appropriate and justified. Specifically included in this category are the following:

- A valve whose failure in a position other than its normal position could jeopardize the immediate safety of the plant or system components;
- A valve whose failure in a position other than its normal position could cause all trains of a safeguard system to be inoperable;
- A valve whose failure in a position other than its normal position that might cause a transient that could lead to a plant trip; or
- When test requirements or conditions are precluded by system operation or access.

Reactor Coolant (8770-G-078, Sh 110A)

PCV-1100E and PCV-1100F
Pressurizer Spray Control Valves

During normal power operations, these two valves are used to control RCS pressure by automatically throttling the spray flow into the pressurizer. Fully opening these valves, in preparation for timing the stroke closed test, would have an immediate negative effect on RCS pressure. The increased spray flow would condense part of the steam bubble inside the pressurizer, causing pressurizer pressure, and therefore RCS pressure, to drop rapidly.

V1402 and V1404
Power-Operated Relief Valves

Due to the potential impact of the resulting transient should one of these valves open prematurely or stick in the open position, it is considered imprudent to cycle them during plant operation with the reactor coolant system at full operating pressure.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
(Page 2 of 10)

Reactor Coolant (8770-G-078, Sh 110A) (continued)

V1441 through V1446 and V1449
Reactor Coolant System Vents

These valves are administratively controlled in the keylocked closed position with the power supply disconnected to prevent inadvertent operation. Since these are reactor coolant system boundary valves, failure of a valve to close or significant leakage following closure can result in a loss of coolant in excess of the limits imposed by the Technical Specifications leading to a plant shutdown. Furthermore, if a valve were to fail open or valve indication fail to show the valve returned to the fully closed position following exercising, prudent plant operation would likely result in a plant shutdown. Note also that Technical Specification 3.4.10 requires these valves to be closed during operation.

This justification agrees with the guidelines provided in NUREG-1482, Paragraph 3.1.1.

Chemical & Volume Control (8770-G-078, Sh 120B)

SE-02-03 and SE-02-04
Auxiliary Pressurizer Spray Valves

Opening either of these valves (or failure in the open position) during plant operation would cause an RCS pressure transient that could potentially adversely affect plant safety and lead to a plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to undesirable thermal shock.

V2431
Auxiliary Pressurizer Spray Check Valve

In order to test this valve, either SE-02-03 or SE-02-04 must be opened. Opening either of these valves (or failure in the open position) during plant operation would cause an RCS pressure transient that could potentially adversely affect plant safety and lead to a plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to undesirable thermal shock.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1

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Chemical & Volume Control (8770-G-078, Sh 120B) (continued)

V2432
Loop B Charging Injection Check Valve

In order to fully stroke this valve all other parallel pathways into the RCS must be isolated. This would require closing manual valve V2434. Since V2434 is located inside the containment building it is considered to be inaccessible during plant operation at power.

V2515 and V2516
Letdown Line Isolation Valves

Closing either of these valves during operation isolates the letdown line from the RCS and would result in undesirable pressurizer level transients with the potential for a plant trip. If a valve failed to reopen, then an expedited plant shutdown would be required.

Chemical & Volume Control (8770-G-078, Sh 121A)

V2501
Volume Control Tank Outlet Valve

Closing this valve during operation of a charging pump would isolate the VCT from the charging pump suction header with the potential for damaging any operating charging pump. This would effectively interrupt the flow of charging water flow to the RCS with the potential of an RCS transient and plant trip.

SE-01-01 and V2505
RCP Seal Water Return Valves

Closing either of these valves when any of the reactor coolant pumps (RCPs) are in operation would interrupt flow from the RCP seals and result in damage to the pumps' seals. Thus testing these valves would require the unnecessary shutdown of all the reactor coolant pumps or installation of elaborate means to ensure seal leakage is maintained while these valves are closed.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Chemical & Volume Control (8770-G-078, Sh 121A) (continued)

V2118
VCT Discharge Header Check Valve

This is simple swing check valve that does not have any external means of exercising or determining obturator position. Therefore, the only methods available to verify valve closure are a backflow test or a non-intrusive test (i.e., radiography). Both of these methods require isolation or cessation of normal charging flow. Since reactor coolant pump seal bleed-off must be isolated to maintain reactor coolant inventory when normal charging is secured, these tests can only be performed during a refueling outage or cold shutdown of sufficient length to stop both reactor coolant pumps. /R4

Safety Injection / Residual Heat Removal (8770-G-078, Sh 130B)

V3106 and V3107
LPSI Pump Discharge Check Valves

During normal plant operation, the LPSI Pumps can not develop sufficient discharge pressure to pump through these valves to the RCS and exercise them in the open direction. The only other test flowpath available is through the shutdown cooling line recirculating to the RWT. This would require opening valves HCV-3657, V3460 and V3459. With these valves open, both trains of the LPSI subsystem would be considered to be inoperable, therefore this testing scheme is unacceptable.

V3659 and V3660
Minimum Flow/Recirculation Line Isolation Valves

Failure of either of these valves in the closed position during testing will render all safety injection pumps inoperable due to the high probability of damage should these pumps be started and operated without sufficient flow for cooling of pump internal components.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Safety Injection / Residual Heat Removal (8770-G-078, Sh 131A)

V3114, V3124, V3134 and V3144
LPSI Injection Check Valves

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow. Since no full flow recirculation path exists, full stroke exercising of these valves would require operating a low pressure safety injection (LPSI) pump at nominal accident flowrate and injecting into the reactor coolant system. At power operation this is not possible because the LPSI pumps do not develop sufficient discharge pressure to overcome reactor coolant system pressure. Partial flow testing is similarly not practical since it would require isolating the associated safety injection tank which is not permitted during plant operation.

V3480, V3481, V3651 and V3652
Shutdown Cooling RCS Isolation Valves

These valves are provided with electrical interlocks that prevent opening during reactor power operation. In addition, during operation it is likely that these valves will experience a large differential pressure (in excess of 2000 psid). At this differential pressure the valve operators are incapable of opening the valves. Furthermore, if they could be opened operation at high differential pressure it could result in damage to their seating surfaces. For these reasons exercising these valves in any plant condition other than cold shutdown is impractical.

Safety Injection / Residual Heat Removal (8770-G-078, Sh 131B)

V3614, V3624, V3634 and V3644
SI Tank Discharge Isolation Valves

During normal plant operation, these valves are administratively controlled to be locked open with their breakers racked out to ensure they remain in the open position with no chance of misalignment. These valves are also interlocked such that they will automatically go open if RCS pressure is greater then 350 psia. Therefore, the valves can only be cycled closed during Modes 4 (<350 psia), 5 and 6.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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/R4

Main Steam (8770-G-079, Sh 1)

HCV-08-1 A&B
Main Steam Isolation Valves

Closing either of these valves isolates the associated steam header. During power operation isolation of a header would require a significant power reduction and could result in unacceptable steam generator level and reactor power transients with the potential for a plant trip.

MV-08-1 A&B
Main Steam Isolation Valve Bypass Valves

The operating criteria and interlocks prevent opening either of these valves whenever the MSIV or Bypass valve in the other steam line are open. Thus during normal plant operations these valves cannot be cycled.

V08130 and V08163
Main Steam Supply to AFW Pump 1C Turbine

Full-stroke exercising of these valves would require operation of Auxiliary Feedwater Pump 1C and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stress on the feedwater system piping components. These valves will be partial stroke tested during quarterly testing via the minimum flow recirculation lines.

Main Steam (8770-G-079, Sh 7)

SE-08-1A1 through 1A4 and SE-08-1B1 through 1B4
Main Steam Isolation Valve (MSIV) Air Pilot Valves

The pneumatic control systems for each of the MSIVs are designed such that the operation of these pilot valves can be verified and tested while the plant is operating at power and the associated MSIV is open; however, there is concern that a failure of a blocking valve or procedural mishap could inadvertently cause an MSIV to close. Closure of one of these valves at power would subject the plant to a significant and traumatic transient with a plant trip likely.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Feedwater (8770-G-080, Sh 3)

MV-09-01 and 02
Main Feedwater Pump Isolation Valves

During plant power operation, closure of either of these valves is not practical as it would require a significant decrease of plant power and possibly securing a main feedwater pump in addition to upsetting the steam plant static operating condition.

NUREG-1432, Vol 1, Rev. 1, "STANDARD TECHNICAL SPECIFICATIONS - Combustion Engineering Plants Specifications", states that MFIVs should not be tested (full or partial stroke) at power and they are exempt from the requirements of the ASME Code, Section XI while operating in Modes 1 or 2. Based on this recommendation, these valves should not be partial stroke tested.

MV-09-07 and 08
Main Feedwater Isolation Valves

During plant power operation, closure of either of these valves is not practical as it would require isolating a steam generator which would result in a severe transient on the steam and reactor systems and a possible plant trip.

NUREG-1432, Vol 1, Rev. 1, "STANDARD TECHNICAL SPECIFICATIONS - Combustion Engineering Plants Specifications", states that MFIVs should not be tested (full or partial stroke) at power and they are exempt from the requirements of the ASME Code, Section XI while operating in Modes 1 or 2. Based on this recommendation, these valves should not be partial stroke tested as well.

Feedwater (8770-G-080, Sh 4)

V09107, 09123 and 09139
Auxiliary Feedwater Pump Discharge Check Valves

Full-stroke exercising of these valves would require operation of a related auxiliary feedwater pump and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stress on the feedwater system piping components.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Feedwater (8770-G-080, Sh 4) (continued)

V09119, 09135, 09151 and 09157
Auxiliary Feedwater Header Check Valves

Full-stroke exercising of these valves would require operation of a related auxiliary feedwater pump and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This would result in unacceptable thermal stresses on the feedwater system piping components.

V12174 and V12176
Auxiliary Feedwater Pump Suction Check Valves

Full-stroke exercising of these valves would require operation of a related auxiliary feedwater pump and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stresses on the feedwater system piping components. These valves will be partial stroke tested during quarterly testing via the minimum flow recirculation lines.

V12177
Unit 2 Condensate Storage Tank (CST) to 1A and 1B Auxiliary Feedwater Pump Suction Isolation

This manual valve is opened when cross connecting the 1A and 1B Auxiliary Feedwater Pump suction to the Unit 2 CST. This function is required in the event that a missile ruptures the Unit 1 CST which is not missile-protected vertically. Opening this valve during plant power operation is unacceptable as it would jeopardize the operability of 1A and 1B Auxiliary Feedwater Pumps by connecting their common suction piping to non-classed and non-seismic piping. Thus a credible single failure of the non-classed piping without timely operator action could disable both auxiliary feedwater pumps.

V12497
Unit 1 Condensate Storage Tank (CST) Outlet to 1A/1B Auxiliary Feedwater Pump Suction Isolation

This manual valve is closed to isolate the Unit 1 CST when cross connecting the 1A and 1B Auxiliary Feedwater Pump suction to the Unit 2 CST. This is required if a missile ruptures the Unit 1 CST which is not missile-protected vertically. Closing this valve during plant operation is unacceptable as it would render both the 1A and 1B Auxiliary Feedwater Pumps inoperable.

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Component Cooling Water (8770-G-083, Sh 1B)

HCV-14-1, 2, 6 & 7
RCP Cooling Water Supply/Return Isolation Valves

These valves are required to be open during plant operations to ensure continued cooling of reactor coolant pump components. Closing any of these valves during plant operation could result in severe RCP damage leading to plant operation in a potentially unsafe mode and a subsequent plant shutdown.

Instrument Air (8770-G-085, Sh 2A)

V18279 and V18283
Instrument Air Supply to Maintenance Hatch Door A[B] in Annulus

V18290, V18291, V18294 and V18295
Instrument Air to FCV-25-7 & 8 (Containment Vacuum Breakers)

These are simple check valves with no external means of exercising nor for determining disc position, thus the only practical way of verifying closure is by means of a backflow test. Testing of these valves by any method requires isolation of a common instrument air header to the shield building annulus so that a vent path may be created on the upstream side of the check valves to determine closure. This test removes one maintenance hatch seal and/or containment vacuum relief from service and potentially renders both trains inoperable due to the time that instrument air would be isolated from the common header and the use of the opposing train component as the requisite vent path. Although isolation of instrument air and subsequent testing of a single train should not keep at least one train from functioning, it requires that both trains of the shield building ventilation system (Technical Specification 3.6.6.1) and containment vacuum relief (Technical Specification 3.6.5) be considered out of service. This would require entry into the technical specification applicability statements as non-compliance for containment vacuum relief applicable in Modes 1 through 4 and require plant shutdown.

Testing of these valves requires entry into the shield building annulus for valve lineup and monitoring purposes - a neutron radiation area during Modes 1 and 2. Due to ALARA considerations and the aforementioned dual train operability concerns with components credited for accident mitigation, these valves should only be tested at cold shutdown intervals. This is consistent with the guidelines presented in NUREG-1482, Paragraph 3.1.1(1).

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COLD SHUTDOWN JUSTIFICATIONS - UNIT 1
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Instrument Air (8770-G-085, Sh 3)

V18099, V18695, V18696 and V18699
MSIV Accumulator Instrument Air Supply Check Valves

Testing of these valves (closed) is not practical during plant operation because it isolates the instrument air supply to the main steam isolation valves (MSIVs) and the atmospheric dump valves (ADVs) and could lead to an inadvertent MSIV closure. Closure of an MSIV would isolate steam from the respective steam generator which would result in a severe transient on the steam and reactor systems and a possible plant trip. Isolation of air to the ADVs would cause them to be inoperable and incapable of opening. Although these valves are not "safety-related" they are operationally important in minimizing plant transients and shutting down the plant if necessary.

Containment Spray (8770-G-088, Sh 1)

V07119 and V07120
RWT Outlet Check Valves

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the closed direction requires a back-leakage test. Such a test requires realignment of the associated safety injection and containment spray train that would render the complete train (LPSI, HPSI and containment spray) inoperable for an extended period of time and entry into a multiple LCO. During plant power operation this is considered to be imprudent. This justification agrees with the guidelines provided in NUREG-1482, Paragraphs 3.1.1 and 3.1.2.

Heating, Air Conditioning and Ventilation, & Air Conditioning (8770-G-878)

FCV-25-1 through FCV-25-6
Primary Containment Purge and Vent Valves

These valves are administratively maintained in the closed position at all times when the plant is operating in Modes 1, 2 or 3 thus they are not required to operate (close) during operational periods. Due to the large size of these valves and the potential for damage as a result of frequent cycling, it is not prudent to operate them more than is absolutely necessary.

END OF APPENDIX D

APPENDIX E
COLD SHUTDOWN JUSTIFICATIONS - UNIT 2
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This appendix is intended to provide the justification for performing valve exercising only at cold shutdown conditions as permitted by Part 10, Paragraphs 4.2.1.2 and 4.3.2.2. In addition, the guidance provided in NUREG-1482, Guidelines For Inservice Testing At Nuclear Power Plants was applied for determining that test deferral is appropriate and justified. Specifically included in this category are the following:

- A valve whose failure in a position other than its normal position could jeopardize the immediate safety of the plant or system components;
- A valve whose failure in a position other than its normal position could cause all trains of a safeguard system to be inoperable;
- A valve whose failure in a position other than its normal position that might cause a transient that could lead to a plant trip; or
- When test requirements or conditions are precluded by system operation or access.

Reactor Coolant (2998-G-078, Sh 107)

V-1460 through V-1466
Reactor Coolant System Vents

These valves are administratively controlled in the key-locked closed position with the power supply disconnected to prevent inadvertent operation. Since these reactor coolant system boundary valves, failure of a valve to close or significant leakage following closure result in a loss of coolant in excess of the limits imposed by Technical Specification 3.4.6.2 leading to a plant shutdown. Furthermore, if a valve were to fail open or valve indication fail to show the valve returned to the fully closed position following exercising, prudent plant operation would likely result in a plant shutdown.

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Reactor Coolant (2998-G-078, Sh 108)

V-1474 and V-1475
Power-Operated Relief Valves

Due to the potential impact of the resulting transient should one of these valves open prematurely or stick in the open position, it is considered imprudent to cycle them during plant operation with the reactor coolant system at full operating pressure.

Chemical & Volume Control (2998-G-078, Sh 120)

V2522
Letdown Line Containment Isolation Valve

Closing this valve during operation isolates the letdown line from the RCS and would result in undesirable pressurizer level transients with the potential for a plant trip. If a valve failed to reopen, then an expedited plant shutdown would be required.

Chemical & Volume Control (2998-G-078, Sh 121A)

V2501
Volume Control Tank Outlet Valve

Closing this valve during operation of a charging pump would isolate the VCT from the charging pump suction header with the potential for damaging any operating charging pump. This would effectively interrupt the flow of charging water flow to the RCS with the potential of an RCS transient and plant trip.

V2505 and V2524
RCP Seal Water Return Valves

Closing either of these valves when any of the reactor pumps (RCPs) are in operation would interrupt flow from the RCP seals and result in damage to the pumps' seals. Thus testing these valves would require the unnecessary shutdown of all the reactor coolant pumps or installation of elaborate means to ensure seal leakage is maintained while these valves are closed.

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Chemical & Volume Control (2998-G-078, Sh 121A) (continued)

V2118
VCT Discharge Header Check Valve

These are simple check valves with no external means of verifying closure, thus closure testing of these valves requires a backflow test. Performance of such a test involves isolation of the normal charging flow path and pressurization of the charging pump suction header using the boric acid pumps. Valve closure is verified by confirming no significant transfer of water from the BAM tank(s) to the VCT. To make this test meaningful and conclusive, all sources of water into the VCT must be isolated, including the RCPs or providing extraordinary means of accommodating seal leak-off which must be maintained whenever a reactor coolant pump is in operation.

Chemical & Volume Control (2998-G-078, Sh 122)

SE-02-03 and SE-02-04
Auxiliary Pressurizer Spray Valves

Opening either of these valves (or failure in the open position) during plant operation would cause an RCS pressure transient that could potentially adversely affect plant safety and lead to a plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to undesirable thermal shock.

V2431
Auxiliary Pressurizer Spray Check Valve

In order to test this valve, either SE-02-03 or SE-02-04 must be opened. Opening either of these valves (or failure in the open position) during plant operation would cause an RCS pressure transient that could potentially adversely affect plant safety and lead to a plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to undesirable thermal shock.

V2432
Loop B Charging Injection Check Valve

In order to fully stroke this valve all other parallel pathways into the RCS must be isolated. This would require closing manual valve V2434. Since V2434 is located inside the containment building it is considered to be inaccessible during plant operation at power.

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Chemical & Volume Control (2998-G-078, Sh 122) (continued)

V2440
Charging Pump Discharge Check Valve to Safety Injection /R4

Opening this valve requires operating a charging pump and discharging into the RCS via the safety injection nozzles. Thermal cycling of the safety injection nozzle is undesirable and should be avoided. /R4

V2515 and V2516
Letdown Line Isolation Valves

Closing these valves during operation isolates the letdown line from the RCS and would result in undesirable pressurizer level transients with the potential for a plant trip. If a valve failed to reopen, then an expedited plant shutdown would be required.

V2523
Charging Line Isolation Valve

Closing this valve during operation isolates the charging pumps from the RCS and would result in undesirable pressurizer level transients with the potential for a plant trip and potential damage to the charging pumps. If the valve failed to reopen, then an expedited plant shutdown would be required.

Safety Injection/Residual Heat Removal (2998-G-078, Sh 130B)

V3101
Safety Injection Supply To Volume Control Tank

This is a simple check valve with no external means of exercising nor for determining disc position, thus the only practical way of verifying opening is by means of a forward flow test. Such a test requires partial draining of an SIT to the VCT. During such a test, if the isolation valves were to fail open for any reason, the SIT would be drained below the Technical Specification limits and the reactor coolant system over-borated to the extent that a plant shutdown would result.

V3106 and V3107
LPSI Pump Discharge Check Valves

During normal plant operation, the LPSI pumps can not develop sufficient discharge pressure to pump through these valves to the RCS and exercise them in the open direction.

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Safety Injection/Residual Heat Removal (2998-G-078, Sh 131)

V3114, V3124, V3134 and V3144
LPSI Injection Check Valves

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the open direction requires system flow since no full flow recirculation path exists, full stroke exercising of these valves would require operating a low pressure safety injection (LPSI) pump at nominal accident flowrate and injecting into the reactor coolant system. At power operation this is not possible because the LPSI pumps do not develop sufficient discharge pressure to overcome reactor coolant system pressure. Partial flow testing is similarly not practical since it would require isolating the associated safety injection tank which is not permitted during plant operation. Verification of closure can be done by operating a HPSI pump with the associated HPSI header isolation valve open and determining check valve backflow. This, however, would unseat the associated downstream header check valve and require leakage testing of this valve per St. Lucie Technical Specification 4.4.6.2. Although not impractical, such quarterly leakage testing would be an undue burden on the plant staff. Note that valves V3114, V3124, V3134 and V3144 remain closed during power operation.

V3480, V3481, V3651 and V3652
Shutdown Cooling RCS Isolation Valves

These valves are provided with electrical interlocks that prevent opening during reactor power operation. In addition, during operation it is likely that these valves will experience a large differential pressure (in excess of 2000 psid). At this differential pressure the valve operators are incapable of opening the valves. Furthermore, if they could be opened operation at high differential pressure it could result in damage to their seating surfaces. For these reasons exercising these valves in any plant condition other than cold shutdown is impractical.

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Safety Injection/Residual Heat Removal (2998-G-078, Sh 132)

V03002 through V03005
Safety Injection Tank (SIT) Drain Line Check Valves

Exercising these valves requires draining of each of the SITs. This is not considered to be an appropriate nor prudent activity to perform during plant operation due to the obvious safety issues related to SIT inventory and chemistry control.

V3258, V3259, V3260 and V3261
Safety Injection Header Check Valves

These valves open to provide flow paths from the high/low pressure safety injection headers to the RCS and close to isolate the headers from the high pressure of the reactor coolant system.

Since no full flow recirculation path exists, full stroke exercising of these valves would require operating a low pressure safety injection (LPSI) pump at nominal accident flowrate and injecting into the reactor coolant system. At power operation this is not possible because the LPSI pumps do not develop sufficient discharge pressure to overcome reactor coolant system pressure.

Partial flow exercising of these valves is performed whenever its associated SIT is refilled. The acceptable SIT level band specified by the Technical Specification is very narrow. The SITs are only refilled on an as needed basis; therefore, the partial flow test can not readily be incorporated into a quarterly test.

Recirculating water to the RWT through containment penetration P-41 can also perform partial flow testing of these valves. This evolution is normally performed following cold shutdown outages to ensure the boron concentration in the headers is maintained at concentrations required for safety injection. This method requires that the containment isolation valves, one of them a manual isolation on Unit 1, and both manual isolations on Unit 2, be opened to complete the flowpath. This lineup breaches containment integrity, as defined in Technical Specifications 3.6.1.1, and therefore can only be aligned infrequently under strict administrative controls. Routine quarterly use of this flowpath violates the intent of these controls and thus is precluded in Modes 1, 2, 3, and 4. /R4

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Safety Injection/Residual Heat Removal (2998-G-078, Sh 132) (continued)

V3614, V3624, V3634 and V3644
SIT Discharge Isolation Valves

During normal plant operation, these valves are administratively controlled to be locked open with their breakers racked out to ensure they remain in the open position with no chance of misalignment. These valves are also interlocked such that they will automatically go open if RCS pressure is greater than 500 psia. Therefore, the valves can only be cycled during Modes 4 (<500 psia), 5 and 6.

V3733 through V3740
SIT Vent Valves

Cycling any of these valves during normal plant operation with the SITs pressurized is undesirable since if a valve were to fail to re-close the result would be de-pressurization of the affected SIT and a plant shutdown. Even controlled venting could reduce SIT pressure below the Technical Specification limits requiring unnecessary recharging of the SIT.

/R4

Main Steam (2998-G-079, Sh 1)

HCV-08-1 A&B
Main Steam Isolation Valves

Closing either of these valves isolates the associated steam header. During power operation isolation of a header would require a significant power reduction and could result in unacceptable steam generator level and reactor power transients with the potential for a plant trip.

NUREG-1432, Vol 1, Rev. 1, "STANDARD TECHNICAL SPECIFICATIONS - Combustion Engineering Plants Specifications", states that MSIVs should not be tested (full or partial stroke) at power and they are exempt from the requirements of the ASME Code, Section XI while operating in Modes 1 or 2.

MV-08-1 A&B
Main Steam Isolation Valve Bypass Valves

The operating criteria and interlocks prevent opening either of these valves whenever the MSIV or Bypass valve in the other steam line are open. Thus during normal plant operation these valves cannot be cycled.

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Main Steam (2998-G-079, Sh 1) (continued)

V08130 and V08163
Steam-Driven AFW Pump Steam Supply Check Valves

Full-stroke exercising of these valves would require operation of Auxiliary Feedwater Pump 2C and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stress on the feedwater system piping components. These valves will be partial stroke tested during quarterly testing via the minimum flow recirculation lines.

MSIV Pneumatic Control (2998-1014)

V2A through V5A, V19A, V20A, V2B through V5B, V19B and V20B
Main Steam Isolation Valve (MSIV) Air Pilot Valves

The pneumatic control systems for each of the MSIVs are designed such that the operation of these pilot valves can be verified and tested while the plant is operating at power and the associated MSIV is open; however, there is concern that a failure of a blocking valve or procedural mishap could inadvertently cause an MSIV to close. Closure of one of these valves at power would subject the plant to a significant and traumatic transient with a plant trip likely.

Feedwater (2998-G-080, Sh 2A)

CHKVLV-1 A&B and CHKVLV-2 A&B
Main Feedwater Air Supply Check Valves

These are simple check valves with no external means of determining disc position; therefore, verification of closure can only be accomplished by performing a backflow or back-leakage test. Since the system was not provided with a convenient testing means, this test requires isolation of the air supply to the subject MFIV and disassembly of portions of the air supply piping. It is not practical to perform such activities routinely on a quarterly basis with the plant operating at power. The risks associated with the degree of undesirability of system disassembly and the potential of introducing foreign materials into the pneumatic operating system outweigh any benefits gained from quarterly testing.

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Feedwater (2998-G-080, Sh 2A) (continued)

HCV-09-1 A&B and HCV-09-2 A&B
Main Feedwater Isolation Valves

During plant power operation, closure of any of these valves is not practical as it would require isolating a steam generator which would result in a severe transient on the steam and reactor systems and a possible plant trip.

NUREG-1432, Vol 1, Rev. 1, "STANDARD TECHNICAL SPECIFICATIONS - Combustion Engineering Plants Specifications", states that MFIVs should not be tested (full or partial stroke) at power and they are exempt from the requirements of the ASME Code, Section XI while operating in Modes 1 or 2. Based on this recommendation, these valves should not be partial stroke tested as well.

Feedwater (2998-G-080, Sh 2B)

V09107, V09123 and V09139
Auxiliary Feedwater Pump Discharge Check Valves

Full-stroke exercising of these valves would require operation of the related auxiliary feedwater pump and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stress on the feedwater system piping components.

V09119, V09135, V09151 and V09157
Auxiliary Feedwater Supply Check Valves

Full-stroke exercising of these valves would require operation of a related auxiliary feedwater pump and injection of cold water (85°F) into the hot (450°F) feedwater supply piping. This, in turn, would result in unacceptable thermal stress on the feedwater system piping components.

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Feedwater (2998-G-080, Sh 2B) (continued)

V12802 and V12803
Unit 2 Condensate Storage Tank (CST) to Unit 1 Auxiliary Feedwater Pump Suction Isolation

These manual valves are opened when cross-tying the Unit 2 CST to the Unit 1 CST. This is required if a missile ruptures the Unit 1 CST which is not protected from vertical missiles. Opening these valves during plant operation is unacceptable as it would jeopardize the Unit 2 Auxiliary Feedwater Pumps by connecting their suction piping to non-classed and non-seismic piping. Thus, a credible single failure of the non-classed piping could disable all the auxiliary feedwater pumps.

Component Cooling System (2998-G-083, Sh 2)

HCV-14-1, 2, 6 & 7
RCP Cooling Water Supply/Return Isolation Valves

These valves are required to be open to ensure continued cooling of reactor coolant pump components and the control rod drives. Closing any of these valves during plant operation could result in severe RCP and CRD damage leading to plant operation in a potentially unsafe mode and a subsequent plant shutdown.

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Instrument Air (2998-G-085, Sh 2A)

V18279 and [V18283]
Instrument Air Supply To Maintenance Hatch Door Seal A[B] In Annulus

V18290, V18291, [V18294 and V18295]
Instrument Air to FCV-25-7 & [8] (Containment Vacuum Breakers)

This is a simple check valve with no external means of exercising nor for determining disc position, thus the only practical way of verifying closure is by means of a backflow test. Testing of these valves by any method requires isolation of a common instrument air header to the shield building annulus so that a vent path may be created on the upstream side of the check valves to determine closure. This test removes one maintenance hatch seal and/or containment vacuum relief from service and potentially renders both trains inoperable due to the time that instrument air would be isolated from the common header and the use of the opposing train component as the requisite vent path. Although isolation of instrument air and subsequent testing of a single train should not keep at least one train from functioning, it requires that both trains of the shield building ventilation system (Technical Specification 3.6.6.1) and containment vacuum relief (Technical Specification 3.6.5) be considered out of service. This would require entry into the technical specification applicability statements as non-compliance for containment vacuum relief applicable in Modes 1 through 4.

Testing of these valves requires entry into the shield building annulus for valve lineup and monitoring purposes - a neutron radiation area during Modes 1 and 2. Due to ALARA considerations and the aforementioned dual train operability concerns with components credited for accident mitigation, these valves should only be tested at cold shutdown intervals.

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Instrument Air (2998-G-085, Sh 2C)

HCV-18-1
Primary Containment Instrument Air Supply

Closing this valve isolates operating air to critical components in the containment building including the pressurizer spray, RCP cooling water supply and return, and CVCS letdown isolation valves and could cause severe plant transients, RCP damage and a plant trip. Failure in the closed position would cause a plant shutdown and RCP damage.

Containment Spray (8770-G-088, Sh 1)

V07119 and V07120
RWT Outlet Check Valves

These are simple check valves with no external means of exercising or for determining obturator position. Thus, testing these valves in the closed direction requires a back-leakage test. Such a test requires realignment of the associated safety injection and containment spray train that would render the complete train (LPSI, HPSI and containment spray) inoperable for an extended period of time and entry into a multiple LCO. During plant power operation this is considered to be imprudent. This justification agrees with the guidelines provided in NUREG-1482, Paragraphs 3.1.1 and 3.1.2.

Heating, Air Conditioning And Ventilation And Air Conditioning (2998-G-878)

FCV-25-1 through FCV-25-6
Primary Containment Purge and Vent Valves

These valves are required to remain closed at all times when the plant is operating in Modes 1 through 4, thus they are not required to operate (close) during operational periods. Due to the large size of these valves and the potential for damage as a result of frequent cycling, it is not prudent to operate them more than is absolutely necessary.

END OF APPENDIX E