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April 23, 2015
GO2-15-055

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 SUBMITTAL OF FOURTH 10-YEAR INSERVICE TESTING (IST) PROGRAM PLAN**

Dear Sir or Madam:

In accordance with 10 CFR 50.55a, Energy Northwest has revised and submits herewith the fourth ten-year interval Inservice Testing (IST) program plan for Columbia Generating Station (Columbia). IST Program Plan complies with the requirements of 10 CFR 50.55a(b)(3) and 50.55a(f). The 2004 edition and the 2005 and 2006 addenda of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) was incorporated by reference into Paragraph 50.55a(b)(3) by rulemaking effective on July 21, 2011. This code edition and addenda have been approved for use by the NRC for the IST of pumps and valves subject to certain limitations and modifications.

Where conformance with certain Code requirements is impractical, relief requests are included in each section with supporting information and proposed alternatives. This is consistent with Final Safety Analysis Report (FSAR) commitments and with federal requirements for component testing as stated in 10 CFR Part 50.55a(f).

Enclosure 1 contains the fourth 10-year program plan implemented on December 13, 2014.

There are no commitments contained in this letter.

Should you have any questions concerning this letter, please contact L. L. Williams, Licensing Supervisor, at (509) 377-8148.

Executed on 23 day of April, 2015

Respectfully,

DW Gregoire

DW Gregoire
Manager, Regulatory Affairs

Enclosure 1: As stated

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Sr. Resident Inspector - 988C
CD Sonoda – BPA/1399
WA Horin - Winston & Strawn

Enclosure 1

FOURTH 10-YEAR INSERVICE TESTING (IST) PROGRAM PLAN

INSERVICE TESTING PROGRAM PLAN

FOURTH TEN-YEAR INSPECTION INTERVAL

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

USNRC DOCKET NO. 50-397

FACILITY OPERATING LICENSE NO. NPF-21

COMMERCIAL OPERATION DATE: DECEMBER 13, 1984

ENERGY NORTHWEST
Columbia Generating Station

INSERVICE TESTING PROGRAM PLAN
Fourth Ten-Year Interval
(13 DEC 2014 through 12 DEC 2024)
Revision 0

Prepared by	Christopher J. Smith IST Program Engineer	12-17-14 Date
Reviewed by	RRana Reviewing Engineer (RAJ RANA)	12-17-14 Date
Concurrence	Richard P. Wolfgramm Supervisor, IST Program	12-17-14 Date
Approved by	J. Kent Dittmer Manager, Technical Services	12-18-14 Date

DESCRIPTION OF CHANGES

Justification (required for major revision)
Rev. 0 for 4th 10 Year Interval update as required by 10 CFR50.55a

Page(s)	**Description (including summary, reason, initiating document, if applicable)**

TABLE OF CONTENTS

1.0 INTRODUCTION

This Inservice Testing (IST) Program Plan is applicable to Columbia Generating Station. A single unit Boiling Water Reactor (BWR), the power Plant is located 11 miles north of Richland, Washington, on the Hanford Reservation. The Plant employs a General Electric (GE) supplied nuclear steam supply system designated as BWR/5. The reactor is contained within an over-under drywell/wetwell containment vessel designated Mark II. The Plant rated electrical output is 1,230 MWe.

This program plan is referenced in the Columbia Generating Station Final Safety Analysis Report (FSAR), Section 3.9.6, and has been prepared as the controlling document governing Pump and Valve Inservice Testing at Columbia Generating Station. This IST Program Plan complies with the requirements of 10 CFR Part 50.55a(b)(3) and Part 50.55a(f). The 2004 edition and the 2005 and 2006 addenda of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) was incorporated by reference into Paragraph 50.55a(b)(3) by rulemaking effective on July 21, 2011. This code edition and addenda have been approved for use by the NRC for the IST of pumps and valves subject to certain limitations and modifications. The scope of this plan encompasses the testing of certain safety-related ASME Section III Nuclear Code Class 1, 2 and 3 pumps and valves. The plant safe-shutdown condition is cold shutdown. Where conformance with certain Code requirements is impractical, relief requests are included in each section with supporting information and proposed alternatives. This is consistent with FSAR commitments and with federal requirements for component testing as stated in 10 CFR Part 50.55a(f).

This Program Plan is comprised of two subprograms – the Pump Inservice Testing Program and the Valve Inservice Testing Program. The detailed description of the scope, implementation, and administration of these two programs is detailed in subsequent Sections (4.0 and 5.0).

1.1 Program Administration

Responsibilities for development, maintenance, and implementation of the IST Program Plan are detailed in Energy Northwest procedures.

Changes to the IST Program Plan involving a relief request from impractical Code requirements will be accomplished consistent with 10 CFR 50.55a.

Components failing to meet test requirements will be dispositioned by the Plant's Corrective Action program. Specific responsibilities are defined in the Plant procedures.

1.1.1 Code Errata/Editorial changes are defined by ASME as follows:

Most editions of the ASME Code as published contain a number of editorial changes and perhaps some errata. Errata may include but, are not limited to the following:

- Typographical errors or misspelling
- Grammatical errors
- Incorrect publication of approved items, omission by staff of approved items, printer errors, or incorrect publication of an item that was not approved.
- Neglecting to update table for consistency with revision to corresponding text.

The changes described in Errata apply retroactively.

Generally, editorial changes are non-substantive and do not change the Code requirements in any way. At the Columbia Generating Station, editorial changes/errata are incorporated as applicable as soon as they have been approved by the ASME OM Code committee as being editorial/errata. Errata are also able to be incorporated retroactively.

1.1.2 Regulatory Conditions

Regulatory Conditions are additional requirements or conditions that are imposed by the NRC in addition to, or in lieu of, those listed or endorsed in the ASME OM Code. Regulatory conditions may also be specific Code requirements which are NOT endorsed by the NRC, and which are required to be satisfied in order to fully implement regulatory requirements to the satisfaction of the NRC. The NRC may also impose additional or alternate methodology or requirements for IST Programs which are listed in 10 CFR 50.55a.

The Columbia Generating Station has fully implemented all applicable regulatory conditions in the update to the 4th Ten Year Interval IST Program. The specific Regulatory Limitations applicable to the Columbia Generating Station IST Program and, which have been incorporated into the 4th Ten Year Interval IST Program are listed below:

a. Motor Operated Valve Testing complies with the provisions for testing motor-operated valves in OM Code ISTC-3500, as applicable and a program (conforming to the requirements of Generic Letter 96-05) has been established to ensure that motor operated valves continue to be capable of performing their design basis safety functions.

1.2 Program Database

The IST Program Plan was developed based on a review of pumps and valves at Columbia Generating Station and the applicable Code inservice testing requirements. To provide added assurance that the IST Program described herein accurately reflected the current requirements, design basis, and licensing commitments, the existing IST Program database was reviewed again. All ASME Code class 1, 2, and 3 pumps and valves were reviewed for inclusion in the IST program and a justification for not exclusion is provided in the program database. Identification of active and passive safety functions, categorization per Code requirements, required testing and test frequencies is provided in test tables. Where compliance with specified test requirements was deemed impractical, relief from such requirements is requested. Non-ASME components that have a safety function are either included in the IST Program plan or are being tested by other plant procedures to satisfy 10CFR50 Appendix B requirements.

The administrative process for design and configuration management requires changes be reviewed for impact on the IST Program. This will assure that potential changes affecting the commitments described herein are identified in a timely manner and allow for the associated database to be updated accordingly.

1.3 References

1.3.1 10 CFR 50.55a, Codes and Standards

1.3.2 Columbia Generating Station Technical Specifications Section 5.5.6

1.3.3 FSAR Section 3.9.6

1.3.4 10 CFR 50, Appendix J, Columbia Generating Station Primary Containment Leakage RateTesting Program

1.3.5 ASME OM Code-2004 Edition, Code for Operations and Maintenance of Nuclear Power Plants

1.3.6 ASME OMa Code-2005 Addenda to ASME OM Code-2004, Code for Operations and Maintenance of Nuclear Power Plants

1.3.7 ASME OMb Code-2006 Addenda to ASME OM Code-2004, Code for Operations and Maintenance of Nuclear Power Plants

1.3.8 NUREG-1482 Revision 2, Guidelines for Inservice Testing at Nuclear Power Plants, October 2013

1.3.9 Safety Evaluation of Columbia Generating Station Relief Requests for Pump and Valve Inservice Testing Program for the third 10-Year Interval by NRC dated March 23, 2007 (Adams Accession Number ML070600111 and TAC NOs. MD3537, MD3538, MD3539, MD3541, MD3542, MD3550, MD3551, AND MD3552) and May 15, 2007 (Adams Accession Number ML071010344 and TAC NOs. MD3536, MD3540, MD3548, MD3549, AND MD3553)

1.3.10 Safety Evaluation of Columbia Generating Station Relief Requests for Pump and Valve Inservice Testing Program for the fourth 10-Year Interval by NRC dated December 9, 2014 (Adams Accession Number ML14337A449 and TAC NOs. MF3847, MF3848, MF3849, MF3851, MF3852, MF3853, MF3854, MF3855, MF3856, MF3857, AND MF3858)

1.3.11 Columbia Generating Station Final Safety Analysis Report

1.3.12 SWP-IST-01, ASME Inservice Testing

1.3.13 NEI White Paper Revision 1, Standard Format for Requests from Commercial Reactor Licensees Pursuant to 10 CFR 50.55a, June 2004

2.0 QUALITY ASSURANCE PROGRAM

The Columbia Generating Station Pump and Valve Inservice Test Program activities will be conducted in accordance with the Energy Northwest's Operational Quality Assurance Program Description (OQAPD).

3.0 PIPING AND INSTRUMENT DIAGRAMS

The Piping and Instrument Diagrams used to generate this Program are listed below. Specific drawing sheet numbers are not listed. Subsequent changes to system design shall be evaluated for impact on the IST Program Plan and new revisions to this Program shall be issued accordingly.

Title	Ref. No.
Main & Exhaust Steam System	M502
Control & Service Air	M510
Diesel Oil & Misc. Systems	M512
Demineralized Water	M517
Reactor Core Isolation Cooling	M519
High/Low Pressure Core Spray	M520
Residual Heat Removal	M521
Standby Liquid Control	M522
Reactor Water Cleanup	M523
Standby Service Water	M524
Reactor Closed Cooling	M525
Fuel Pool Cooling	M526
Control Rod Drive	M528
Main Steam and Reactor Feedwater	M529

Title	Ref. No.
Reactor Recirculation Cooling	M530
Equipment Drain Radioactive	M537
Floor Drain Radioactive	M539
Containment Cooling & Purge	M543
Standby Gas Treatment	M544
Reactor Building HVAC	M545
Containment Instrument Air	M556
Main Steam Leakage Control	M557
Undervessel Neutron Monitoring System	M604
Class I Air System for Containment Vacuum Breaker Valves	M619 Sh 161
Emergency Chilled Water	M775
Post Accident Sampling	M896

4.0 PUMP INSERVICE TESTING PROGRAM

4.1 Introduction

Highly reliable safety related equipment is a vital consideration in the operation of a nuclear generating station. To help assure operability, the Columbia Generating Station Pump Inservice Testing Program has been developed. The program establishes the requirements for preservice and inservice testing to assess the operational readiness of safety related pumps. The program is based on the requirements of the ASME OM Code-2004 edition and 2005 and 2006 addenda subsection ISTB, “Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants”. The Program complies with the specifications of the approved Codes and Regulations. This program includes those ASME pumps which are provided with an emergency power source and perform a specific function in shutting down a reactor to the cold shutdown condition, maintaining the cold shutdown condition, or in mitigating the consequences of an accident.

The Program Plan establishes test intervals, parameters to be measured and evaluated, acceptance criteria, corrective actions, and records requirements. Where conformance with certain Code requirements is impractical, relief requests are included in Section 4.8 with supporting information and proposed alternatives.

4.2 Program Implementation

4.2.1 Exclusions (ISTB-1200)

The following are excluded from this Subsection:

a. drivers, except where the pump and driver form an integral unit and the pump bearings are in the driver;
b. pumps that are supplied with emergency power solely for operating convenience; and
c. skid-mounted pumps that are tested as part of the major component and are justified by the Owner to be adequately tested.

4.2.2 Pump Categories (ISTB-1300)

All pumps in the IST program shall be categorized as either a Group A or Group B pump. A pump that meets both Group A and Group B definitions shall be categorized as a Group A pump. Pump categorization is included in the Pump Inservice Test Table, Section 4.4.

Group A pumps: pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations.

Group B pumps: pumps in standby systems that are not operated routinely except for testing.

4.2.3 Owner's Responsibility (ISTB-1400)

It is the Owner's responsibility to include in both the pumps and plant design all necessary valving, instrumentation, test loops, required fluid inventory, or other provisions that are required to fully comply with the requirements of this Subsection.

4.2.4 Preservice Testing (ISTB-3100)

During the preservice test period or before implementing inservice testing, an initial set of reference values shall be established for each pump. These tests shall be conducted under conditions as near as practicable to those expected during subsequent inservice testing. Except as specified in ISTB-3100, only one preservice test is required for each pump. A set of reference values shall be established in accordance with ISTB-3300 for each pump required to be tested by this Subsection. Preservice testing shall be performed in accordance with the requirements of the following paragraphs:

a. centrifugal pump tests (except vertical line shaft centrifugal pumps) in accordance with ISTB-5110;
b. vertical line shaft centrifugal pump tests in accordance with ISTB-5210; and
c. reciprocating positive displacement pump tests in accordance with ISTB 5310.

4.2.5 Inservice Testing (ISTB-3200)

The Columbia Generating Station Pump Inservice Testing Program is implemented as part of the Technical Specification required surveillance testing program. Inservice testing of a pump in accordance with Subsection ISTB-3200 shall commence when the pump is required to be operable. Inservice testing shall be performed in accordance with the requirements of the following paragraphs:

a. centrifugal pump tests (except vertical line shaft centrifugal pumps) in accordance with ISTB-5120;
b. vertical line shaft centrifugal pump tests in accordance with ISTB-5220; and
c. reciprocating positive displacement pump tests in accordance with ISTB-5320.

4.2.6 Frequency of Inservice Tests (ISTB-3400)

An inservice test shall be run on each pump as specified in Table ISTB-3400-1.

TABLE ISTB-3400-1 INSERVICE TEST FREQUENCY

Pump Group	Group A Test	Group B Test	Comprehensive Test
Group A	Quarterly	N/A	Biennially
Group B	N/A	Quarterly	Biennially

GENERAL NOTE: N/A - Not Applicable

When a Group A test is required, a comprehensive test may be substituted. When a Group B test is required, a Group A or comprehensive test may be substituted. A preservice test may be substituted for any inservice test (ISTB-5000).

4.2.7 Pumps in Systems Out-of-Service (ISTB-3420)

For a pump in a system declared inoperable or not required to be operable, the test schedule need not be followed. Within 3 months before the system is placed in an operable status, the pump shall be tested and the test schedule resumed. Pumps that can only be tested during plant operation shall be tested within 1 week following plant startup.

4.2.8 Reference Values (ISTB-3300)

Reference values are established and maintained in accordance with ISTB-3300 and measured in accordance with ISTB-3500. In most cases, test parameters are measured with permanently installed Plant instrumentation. This approach simplifies the test program and promotes timely completion of surveillance testing. Where permanently installed instrumentation is not available, portable instrumentation is used to record the required parameters.

4.2.9 Instrumentation Accuracy (ISTB-3510(a))

Instrumentation accuracy shall be within the limits of Table ISTB-3500-1. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB 3500-1 (e.g., flow rate determination shall be accurate to within +/- 2% of actual). For individual analog instruments, the required accuracy is percent of full scale. For digital instruments, the required accuracy is over the calibrated range. For a combination of instruments, the required accuracy is loop accuracy. For further clarification see ASME OM Code Interpretation 01-09. The Columbia Generating Station instruments used for pump testing meet these requirements except where written relief has been requested.

TABLE ISTB-3500-1 REQUIRED INSTRUMENT ACCURACY

Quantity	Group A and Group B Test, %	Comprehensive and Preservice Tests, %
Pressure	±2	±½
Flow rate	±2	±2
Speed	±2	±2
Vibration	±5	±5
Differential pressure	±2	±½

<u>NOTE</u>: Refer to PER 297-1048, Columbia response to NRC Information Notice 97-90 for effect of instrument uncertainty on the acceptance criteria.

4.2.10 Inservice Test Parameters (ISTB-3500)

Speed (N) - Pump speed is only measured for variable speed pumps.

Differential Pressure (△P) - Differential pressure is calculated from suction and discharge pressure or obtained by direct differential pressure measurement.

Discharge Pressure (P) - Discharge pressure is measured for positive displacement pumps.

Flow Rate (Q) - Flow rate is measured using a rate or quantity meter installed in the pump test circuit. If a meter does not indicate the flow rate directly, the record shall include the method used to reduce the data. Internal recirculated flow is not required to be measured. External recirculated flow is not required to be measured if it is not practical to isolate, has a fixed resistance, and has been evaluated by the Owner to not have a substantial effect on the results of the test.

Vibration (V) - Vibration measurements for centrifugal pumps, vertical line shaft pumps, and reciprocating pumps shall be taken at the locations specified in ISTB-3540. If a portable vibration indicator is used, the measurement points shall be clearly identified on the pump to permit subsequent duplication in both location and plane.

TABLE ISTB-3000-1 INSERVICE TEST PARAMETERS

Quantity	Preservice Test	Group A Test	Group B Test	Compre-hensive Test	Remarks
Speed, N	X	X	X	X	If variable speed
Differential Pressure, ΔP	X	X	X(Note (1))	X	Centrifugal pumps, including vertical line shaft pumps
Discharge Pressure, P	X	X		X	Positive displacement pumps
Flow Rate, Q	X	X	X(Note (1))	X	
Vibration	X	X		X	Measure either V_d or V_v
Displacement, V_d					Peak-to-peak
Velocity, V_v					Peak

NOTE:

(1) For positive displacement pumps, flow rate shall be measured or determined; for all other pumps, differential pressure or flow rate shall be measured or determined.

4.2.11 Allowable Ranges for Test Parameters

Table ISTB-5121-1, Table ISTB-5221-1 and Table ISTB-5321-2 provide the allowable ranges for pump testing parameters. When the allowable range is more restrictive in the Technical Specifications, or other design basis document, the more restrictive ranges are used.

4.2.12 Testing Methods

During an inservice test, flow rate is normally selected as the independent test parameter and is set to match the reference flow rate. Then other hydraulic and mechanical test parameters are measured in accordance with ISTB-3500. All deviations from the appropriate reference values shall be compared with the appropriate ranges and corrective action taken as specified in ISTB-6200.

All pumps at Columbia Generating Station are capable of being tested at full design flow.

4.2.13 Test Procedure

Each pump in the Pump Testing Program is tested according to detailed test procedures. The procedure includes, as a minimum:

a. Statement of Test Purpose. Identification of test objectives, references applicable Technical Specifications and may note the operating modes for which the test is appropriate.

b. Prerequisites for Testing. System valve alignment, equipment for proper pump operation (cooling water, ventilation, etc.) and additional instrumentation (e.g., test gauges, portable temperature or vibration monitors) is noted. Identification numbers, range and calibration verification of instrumentation are recorded.

c. Test Instructions. Directions are sufficiently detailed to assure completeness and uniformity of testing. Instructions include provisions for returning system to its normal standby configuration following testing. Proposed flow paths are illustrated in Section 4.5.

d. Acceptance Criteria. The ranges within which test data is considered acceptable is established by the Energy Northwest and included in the test procedure. The method for determining test parameter values that are not directly measured by instruments is specified in the procedure. In the event that the data falls outside the acceptable ranges, corrective actions are taken in accordance with ISTB-6200,

e. Test Instruments. A description of instruments used.

f. Reference Values.

4.2.14 Trending (ISTB-6100)

Test parameters shown in Table ISTB-3000-1, except for fixed values, shall be trended.

Finally, it is recognized that the Pump Inservice Testing Program sets forth minimum testing requirements. Additional testing will be performed, as required, after pump maintenance or as determined necessary by the Plant Staff.

4.3 Pump Reference List

This list gives a brief description of each pump identified in the Pump Inservice Test Table, Section 4.4.

DO-P-1A, 1B, 2

These pumps transfer diesel generator fuel oil from the subterranean storage tanks to the diesel's day Tanks. Pump 2 is dedicated to the HPCS Diesel. The discharge lines of Pump 1A and 1B are cross tied, and each pump can supply fuel to either Diesel 1A or 1B.

FPC-P-1A, 1B

The Fuel Pool Cooling (FPC) pumps take suction on the spent fuel pool and discharge through the FPC heat exchangers and, during normal operation, through the Fuel Pool Filter/Demineralizers.

HPCS-P-1

The High Pressure Core Spray pump provides emergency cooling spray to the reactor core. It is capable of injecting coolant at pressures above normal reactor operating pressures. The pump can take suction from the Condensate Storage Tank or from the suppression pool.

HPCS-P-2

This motor driven pump is dedicated to providing cooling water to the HPCS Emergency Diesel Generator, the standby power source for the High Pressure Core Spray System. HPCS-P-2 is located in the Service Water Pump House and takes suction from the spray pond.

LPCS-P-1

A high capacity, low head pump, the Low Pressure Core Spray pump provides cooling spray to the reactor core. LPCS-P-1 takes suction from the suppression pool.

RCIC-P-1

The turbine driven Reactor Core Isolation Cooling pump supplies coolant to the core in the event of reactor vessel isolation. It can take suction from either the Condensate Storage Tank or from the suppression pool.

RHR-P-2A, 2B, 2C

The Residual Heat Removal pumps are high capacity, low head pumps which have multiple uses during normal and emergency Plant conditions.

- In conjunction with other systems, restores and maintains reactor coolant inventory in the event of a LOCA (Pumps 2A, 2B, 2C)
- Removes decay heat after shutdown (Pumps 2A, 2B)
- Cools the suppression pool (Pumps 2A, 2B)
- Can provide cooling spray to upper and lower drywell and to the wetwell (Pumps 2A, 2B)
- Can assist in fuel pool cooling (Pump 2B)
- Can provide a condensing spray to the reactor head (Pump 2B)

Pumps take suction from the suppression pool in the standby operating mode.

SLC-P-1A, 1B

The Standby Liquid Control pumps are used to inject negative reactivity (sodium pentaborate) into the reactor core independently of the control rod system. Suction is obtained from a storage tank containing the sodium pentaborate solution.

SW-P-1A, 1B

The Standby Service Water pumps supply cooling water to separate trains of safety related equipment. The pumps take suction on their respective spray ponds but discharge to the opposite pond. The two spray ponds constitute the ultimate heat sink.

4.4 Pump Inservice Test Table

The pumps included in the Columbia Generating Station IST Program are listed in the Test Table. The information contained in this table identifies those pumps required to be tested to the requirements of OM Code Subsection ISTB, the testing parameters and frequency of testing, and associated relief requests.

Legend

Q	=	Quarterly (92 day interval) test
2Y	=	Biennially (2 Year interval) test
CPT	=	Comprehensive Pump test
N/A	=	Not applicable. See Relief Requests
NR	=	Not required by Code
A	=	Group A Pump
B	=	Group B Pump

Pump Inservice Test Table

Pump Ident	Pump Group	Flow Diagram & Coord	ASME Code Class	Pump Type	Inlet Press (Pi) Q	Inlet Press (Pi) CPT	Disch Press (P) Q	Disch Press (P) CPT	Diff Press (ΔP) Q	Diff Press (ΔP) CPT	Flow Rate Q	Flow Rate CPT	Vib Vel Q	Vib Vel CPT	Pump Speed	Relief Requests & Technical Positions
DO-P-1A*		M512-4 B10	3	Vertical Line Shaft												TP02
DO-P-1B*		M512-4 G10	3	Vertical Line Shaft												TP02
DO-P-2*		M512-4 C2	3	Vertical Line Shaft												TP02
FPC-P-1A	A	M526-1 E13	3	Centrifugal	Q	2Y	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	RG01 RP06
FPC-P-1B	A	M526-1 C13	3	Centrifugal	Q	2Y	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	RG01 RP06
HPCS-P-1	B	M520 B6	2	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	2Y	NR	RG01 RP03,04,06 TP01
HPCS-P-2	A	M524-1 G5	3	Vertical Line Shaft	N/A		Q	2Y	N/A		Q	2Y	Q	2Y	NR	RG01 RP01,02,06 TP01
LPCS-P-1	B	M520 B12	2	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	2Y	NR	RG01 RP03,06 TP01
RCIC-P-1	B	M519 D12	2	Centrifugal	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	2Y	Q/2Y	RG01 RP03,06
RHR-P-2A	A	M521-1 B11	2	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	RG01 RP03,04,06 TP01
RHR-P-2B	A	M521-2 D6	2	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	RG01 RP03,04,06 TP01
RHR-P-2C	A	M521-3 C5	2	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	Q	2Y	Q	2Y	NR	RG01 RP03,04,06 TP01
SLC-P-1A	B	M522 F6	2	Reciprocating Positive Disp.	NR		Q	2Y	NR		Q	2Y	NR	2Y	NR	RG01 RP05,06
SLC-P-1B	B	M522 D6	2	Reciprocating Positive Disp.	NR		Q	2Y	NR		Q	2Y	NR	2Y	NR	RG01 RP05,06
SW-P-1A	A	M524-1 G4	3	Vertical Line Shaft	N/A		Q	2Y	N/A		Q	2Y	Q	2Y	NR	RG01, RP01,02,06 TP01
SW-P-1B	A	M524-2 F5	3	Vertical Line Shaft	N/A		Q	2Y	N/A		Q	2Y	Q	2Y	NR	RG01 RP01,02,06 TP01

*Tested as skid mounted components.

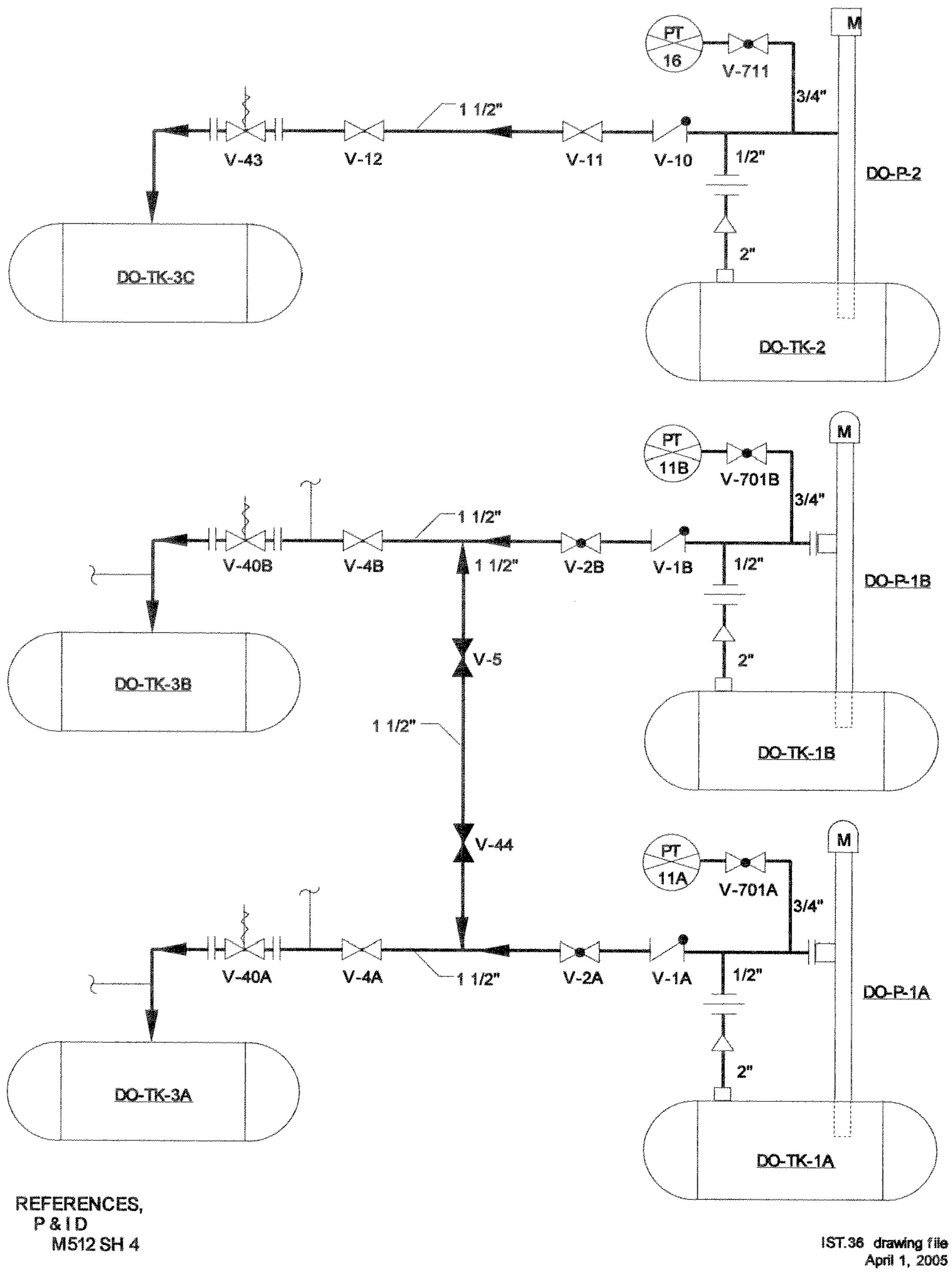
Pump Surveillances Table	
Pump Identification	Surveillance
DO-P-1A*	OSP-DO/IST-Q701
DO-P-1B*	OSP-DO/IST-Q702
DO-P-2*	OSP-DO/IST-Q703
FPC-P-1A	OSP-FPC/IST-Q701
FPC-P-1B	OSP-FPC/IST-Q701
HPCS-P-1	OSP-HPCS/IST-Q701
HPCS-P-2	OSP-SW/IST-Q703
LPCS-P-1	OSP-LPCS/IST-Q702
RCIC-P-1	OSP-RCIC/IST-Q701
RHR-P-2A	OSP-RHR/IST-Q702
RHR-P-2B	OSP-RHR/IST-Q703
RHR-P-2C	OSP-RHR/IST-Q704
SLC-P-1A	OSP-SLC/IST-Q701
SLC-P-1B	OSP-SLC/IST-Q701
SW-P-1A	OSP-SW/IST-Q701
SW-P-1B	OSP-SW/IST-Q702

*Tested as skid mounted components.

4.5 Proposed Pump Test Flow Paths

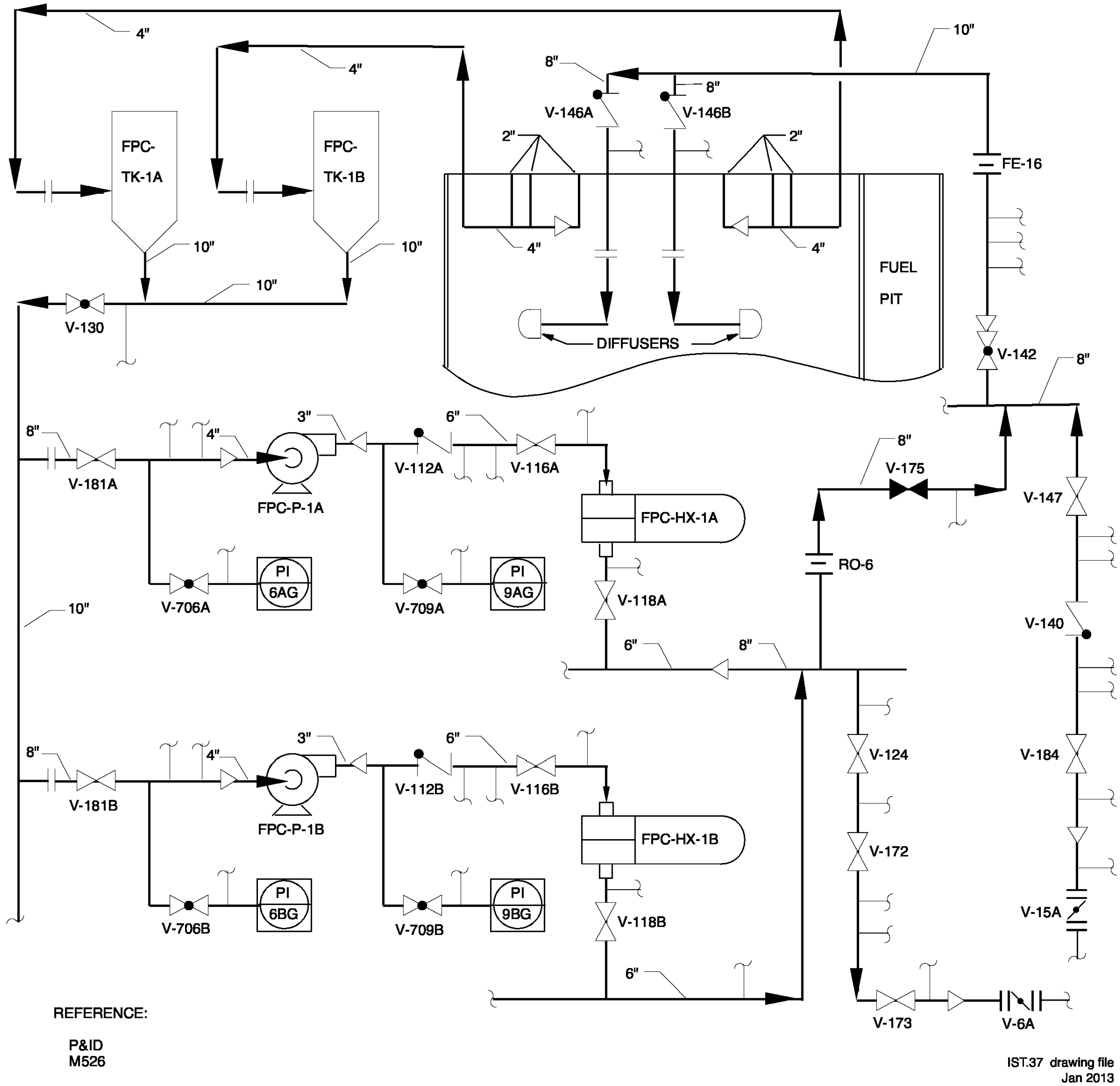
These flow paths are proposed for use during pump and valve testing. Surveillance Procedures define actual system lineup for testing pumps and valves.

DO-P-1A, DO-P-1B, & DO-P-2
PUMP TEST FLOW PATH



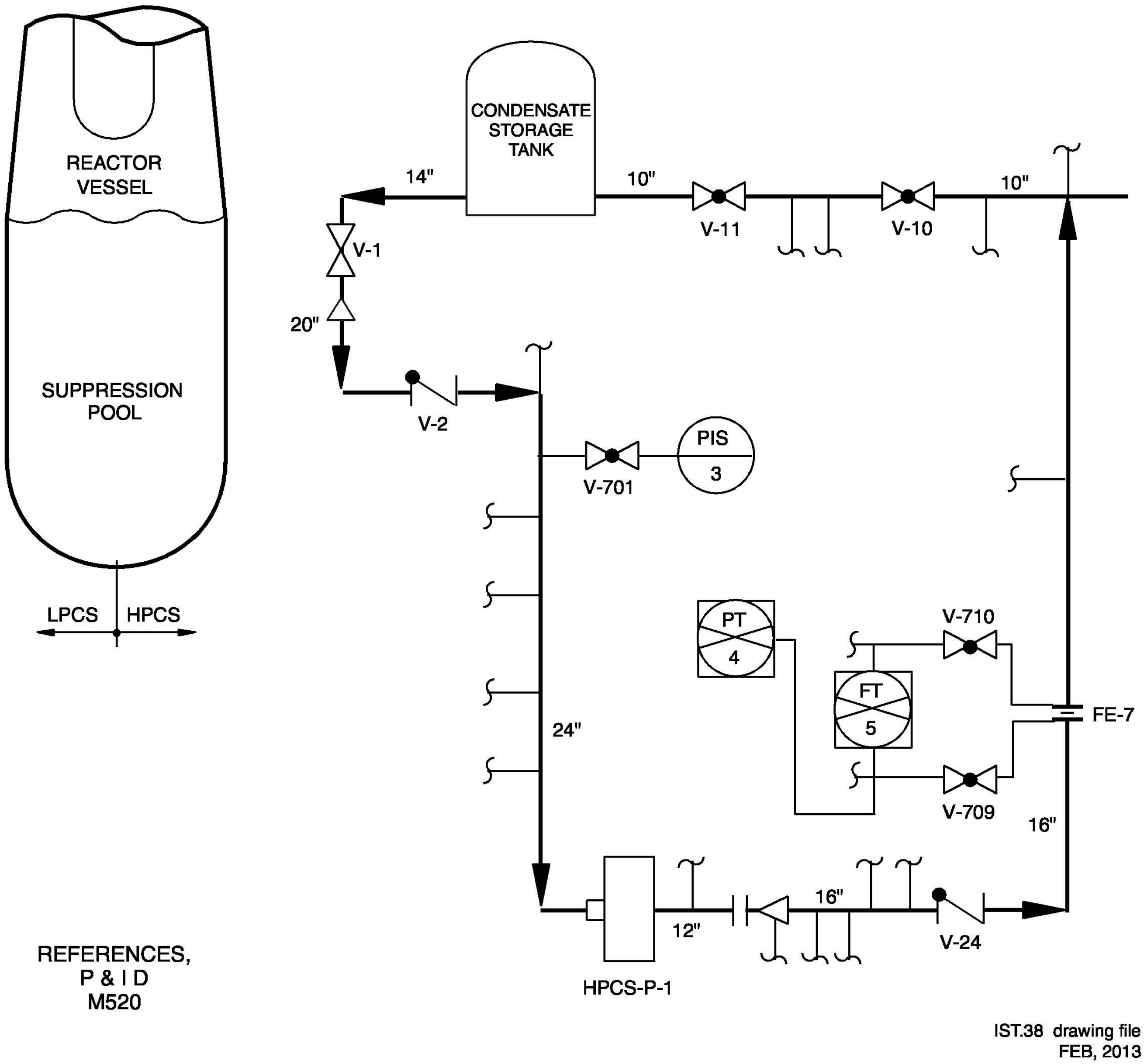
DIESEL FUEL OIL

FPC-P-1A and FPC-P-1B
PUMP TEST FLOW PATH



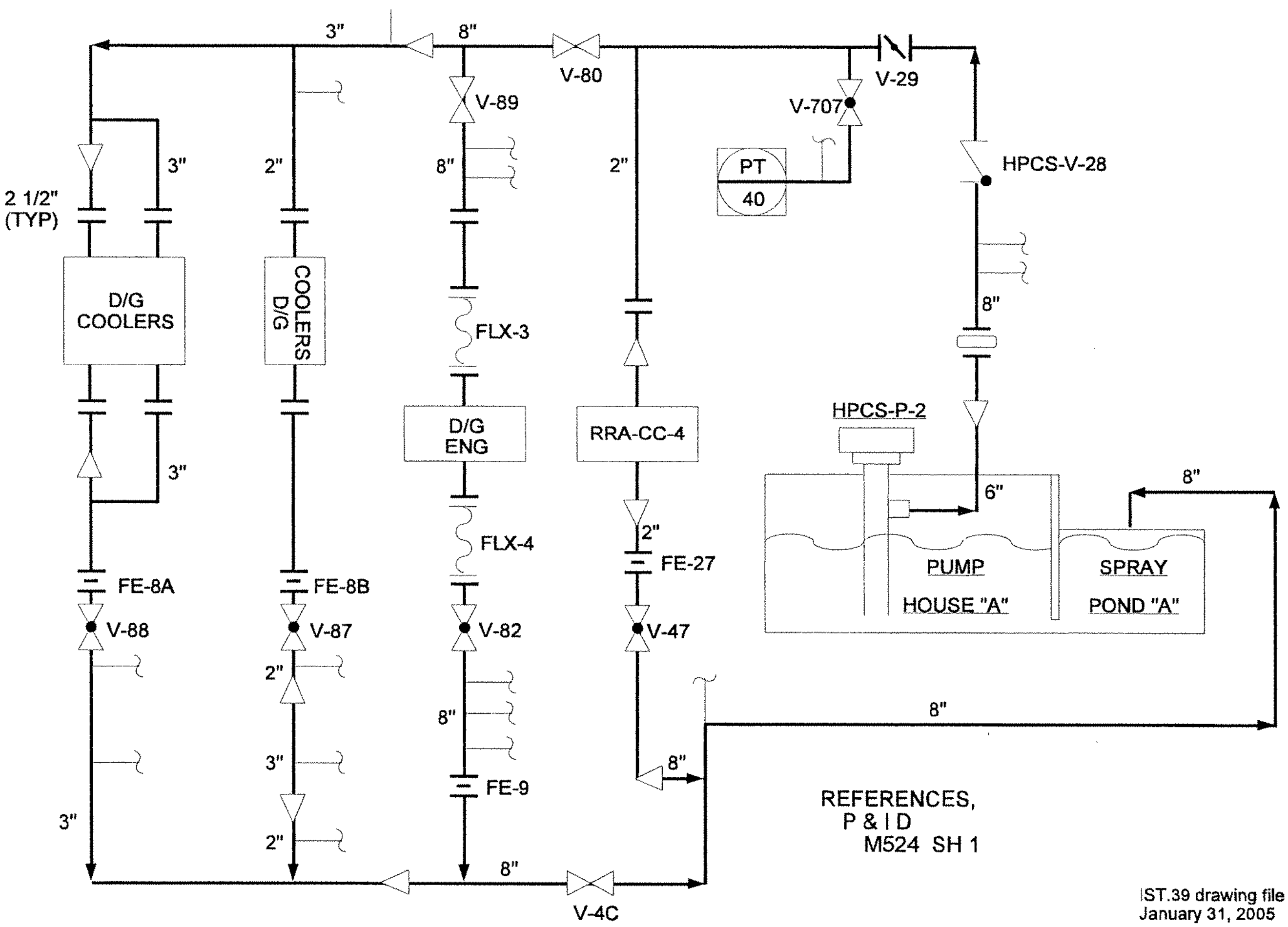
FUEL POOL COOLING

HPCS-P-1 PUMP TEST FLOW PATH



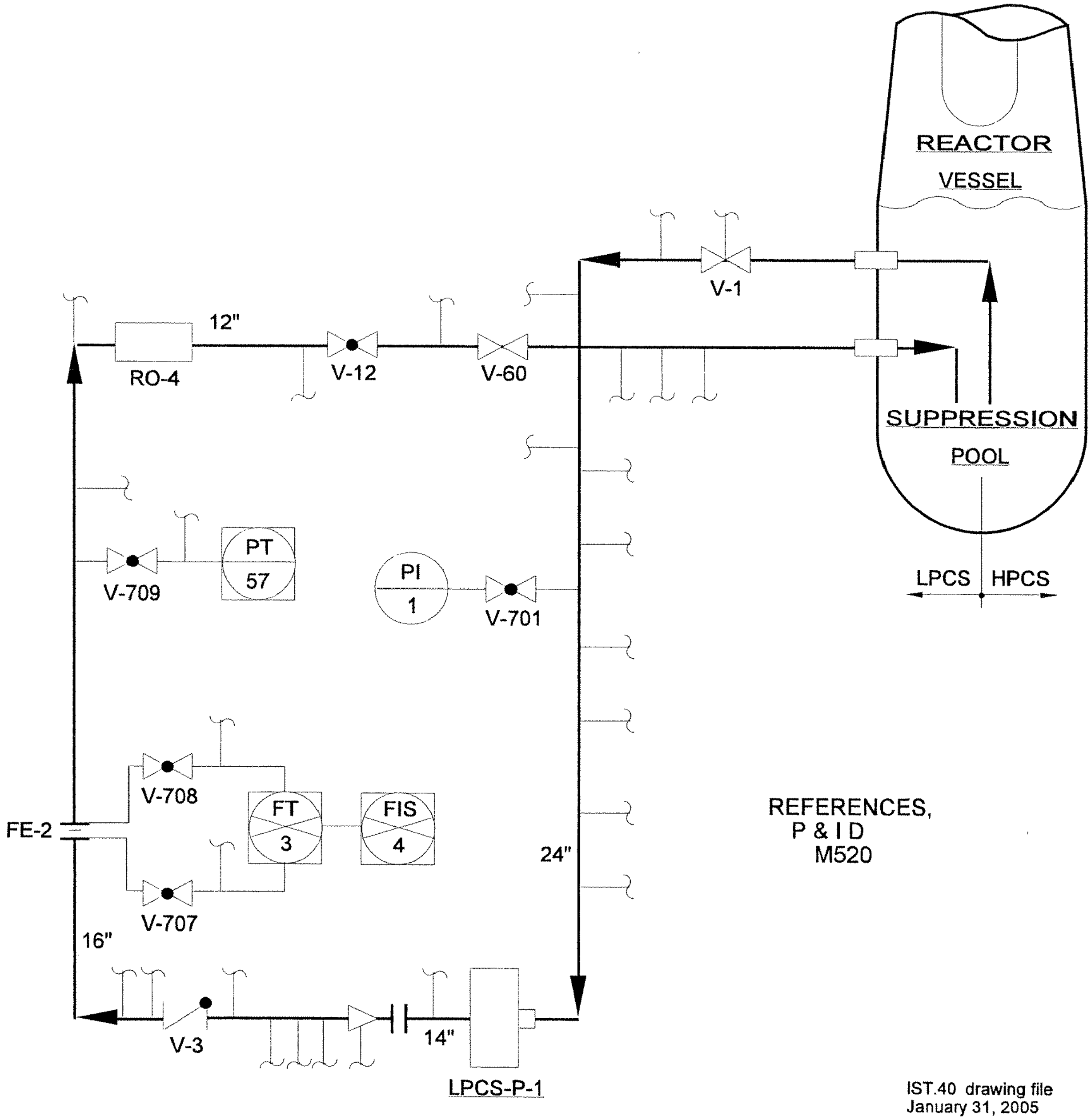
HIGH PRESSURE CORE SPRAY

HPCS-P-2 PUMP TEST FLOW PATH



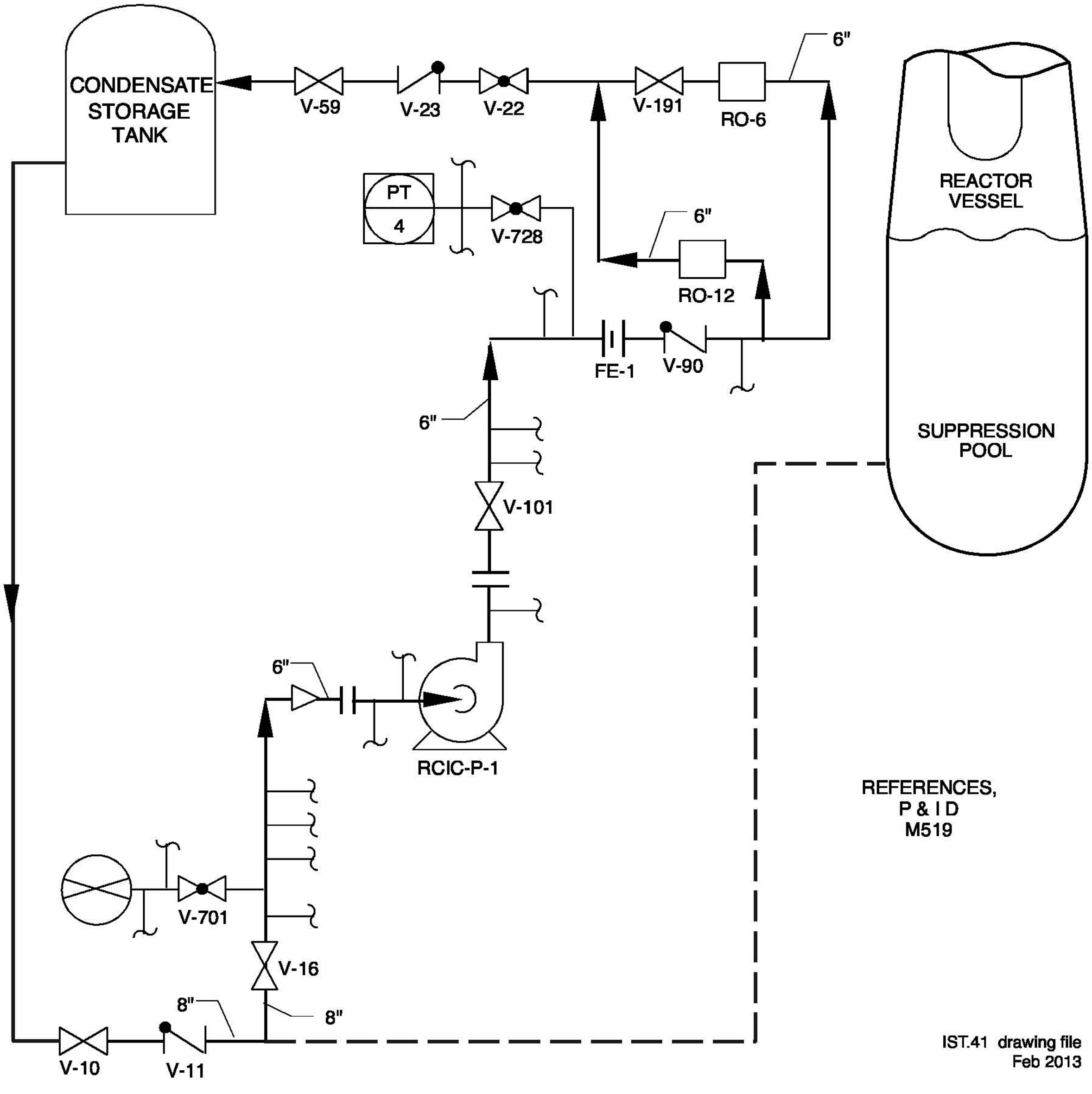
HPCS SERVICE WATER

LPCS-P-1 PUMP TEST FLOW PATH



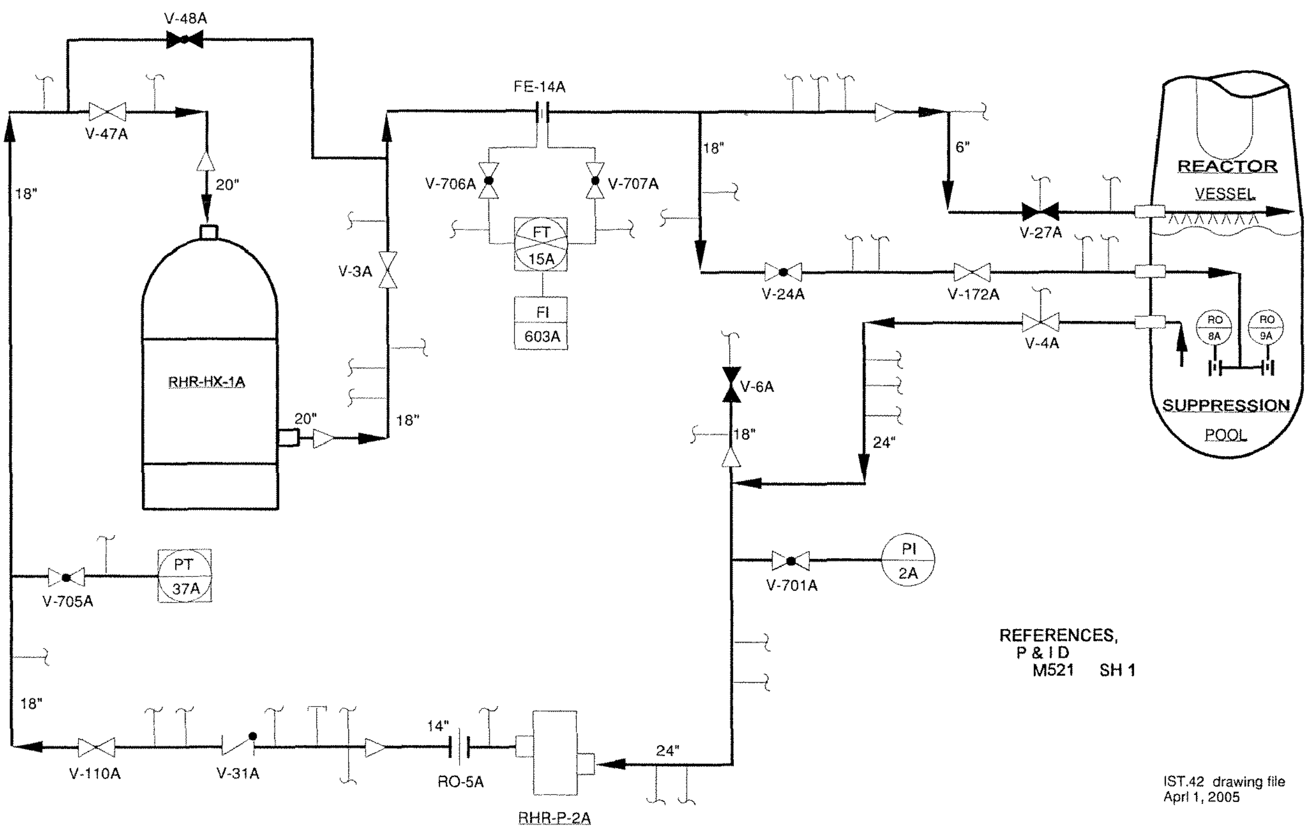
LOW PRESSURE CORE SPRAY

RCIC-P-1 PUMP TEST FLOW PATH



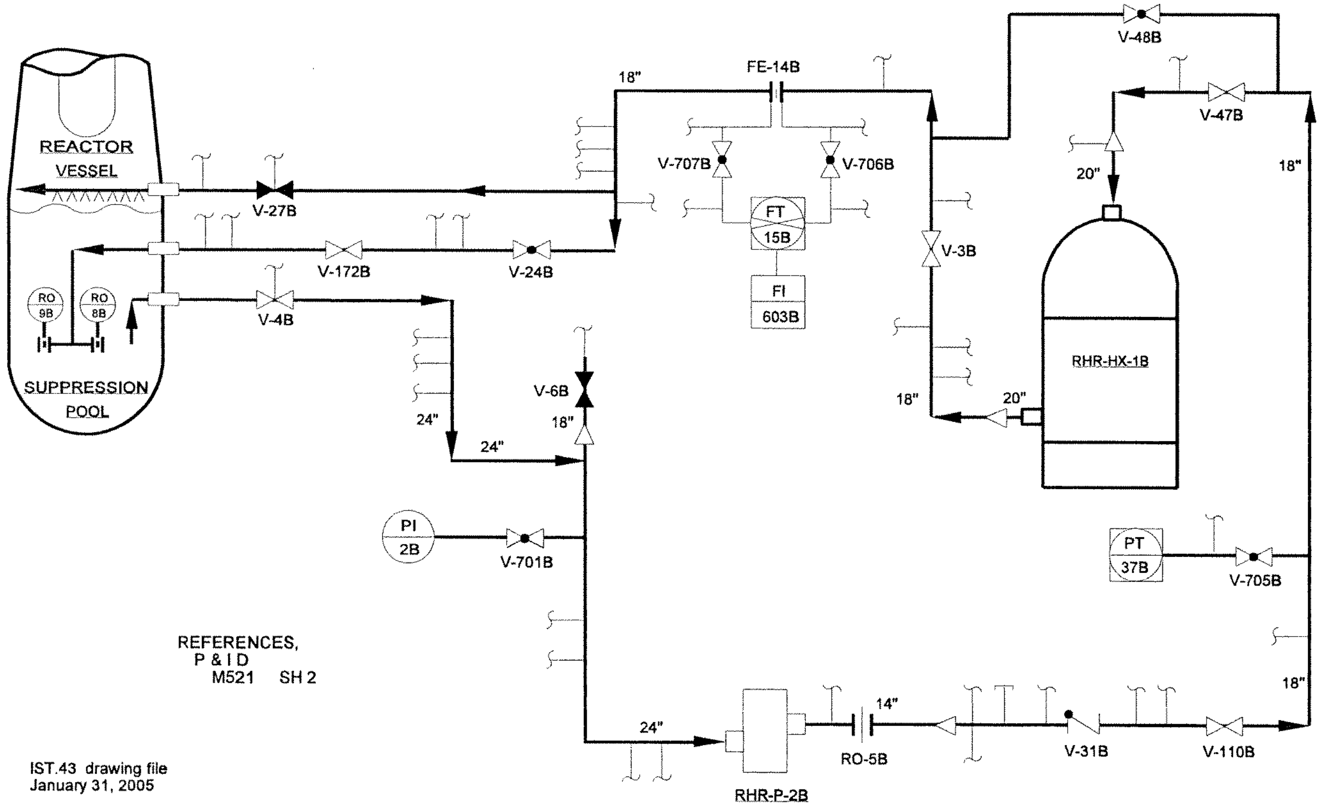
REACTOR CORE ISOLATION COOLING

RHR-P-2A PUMP TEST FLOW PATH



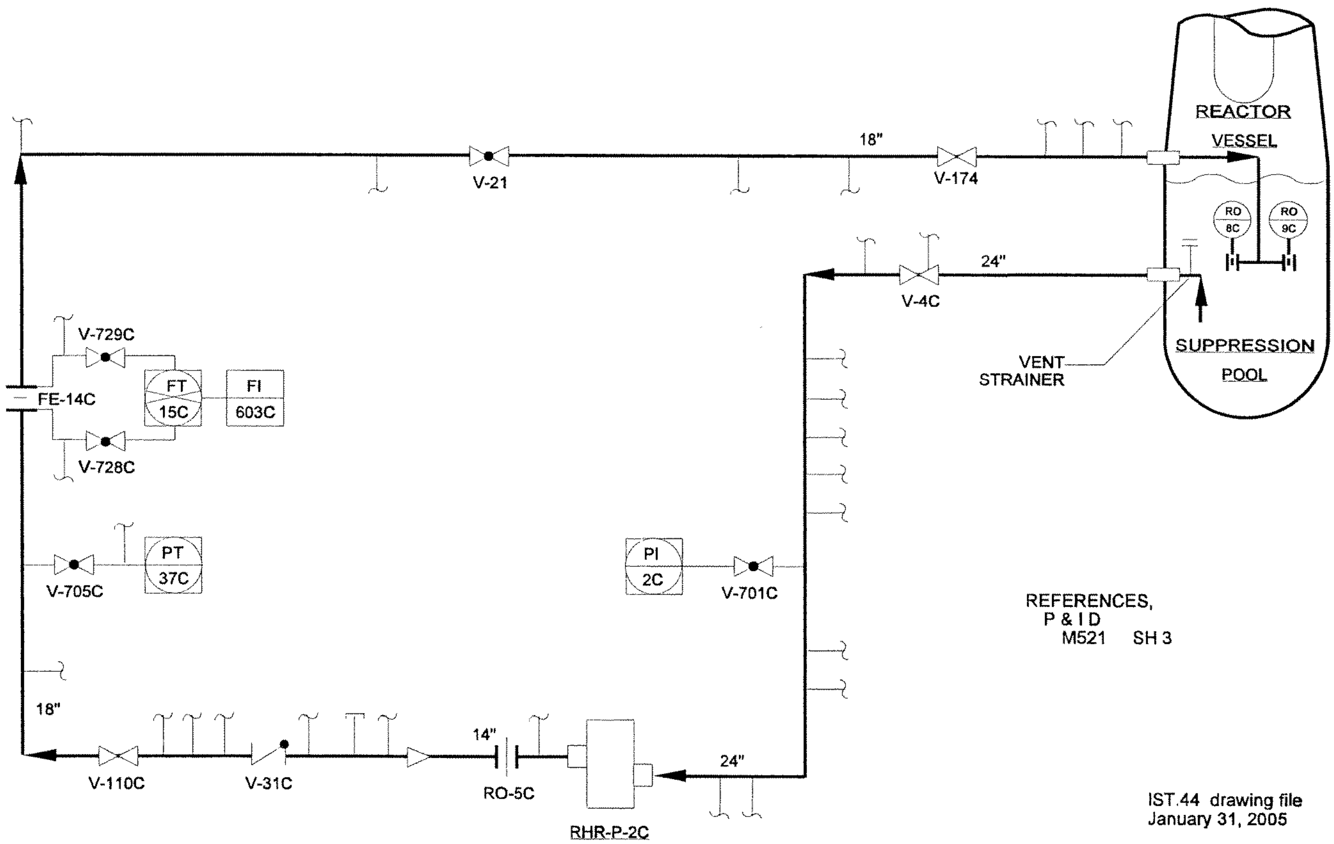
RESIDUAL HEAT REMOVAL

RHR-P-2B PUMP TEST FLOW PATH



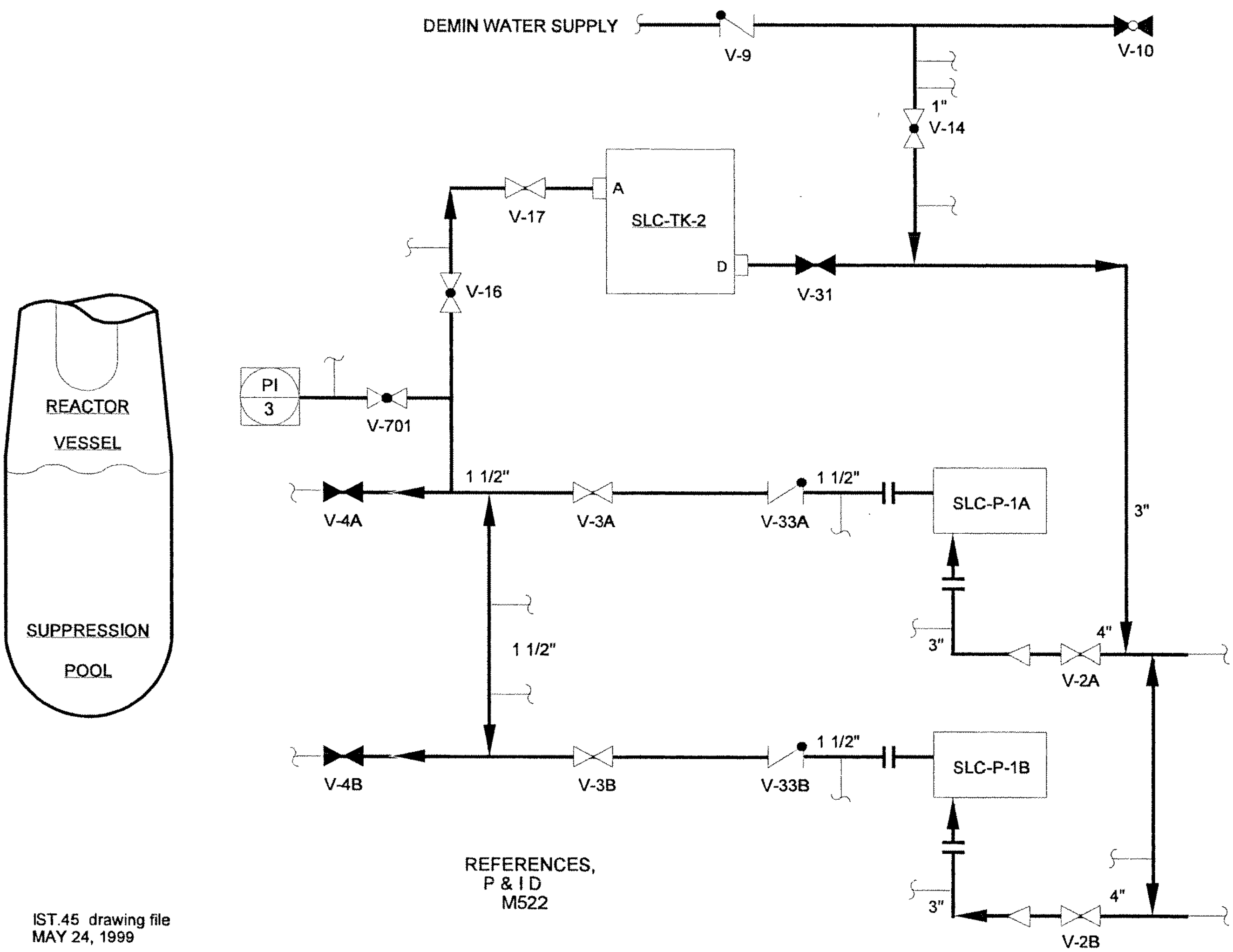
RESIDUAL HEAT REMOVAL

RHR-P-2C PUMP TEST FLOW PATH



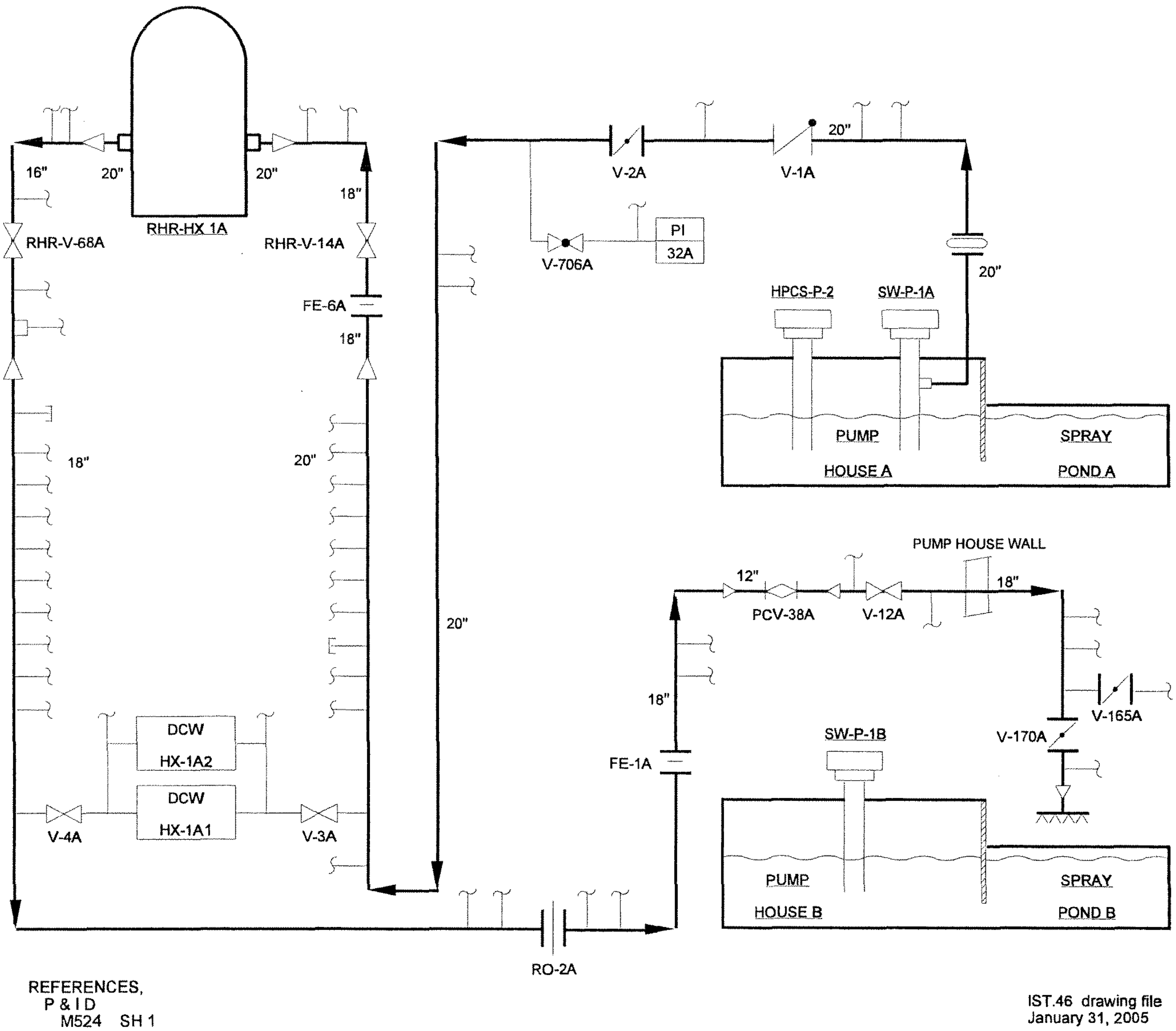
RESIDUAL HEAT REMOVAL

SLC-P-1A & SLC-P-1B
PUMP TEST FLOW PATH



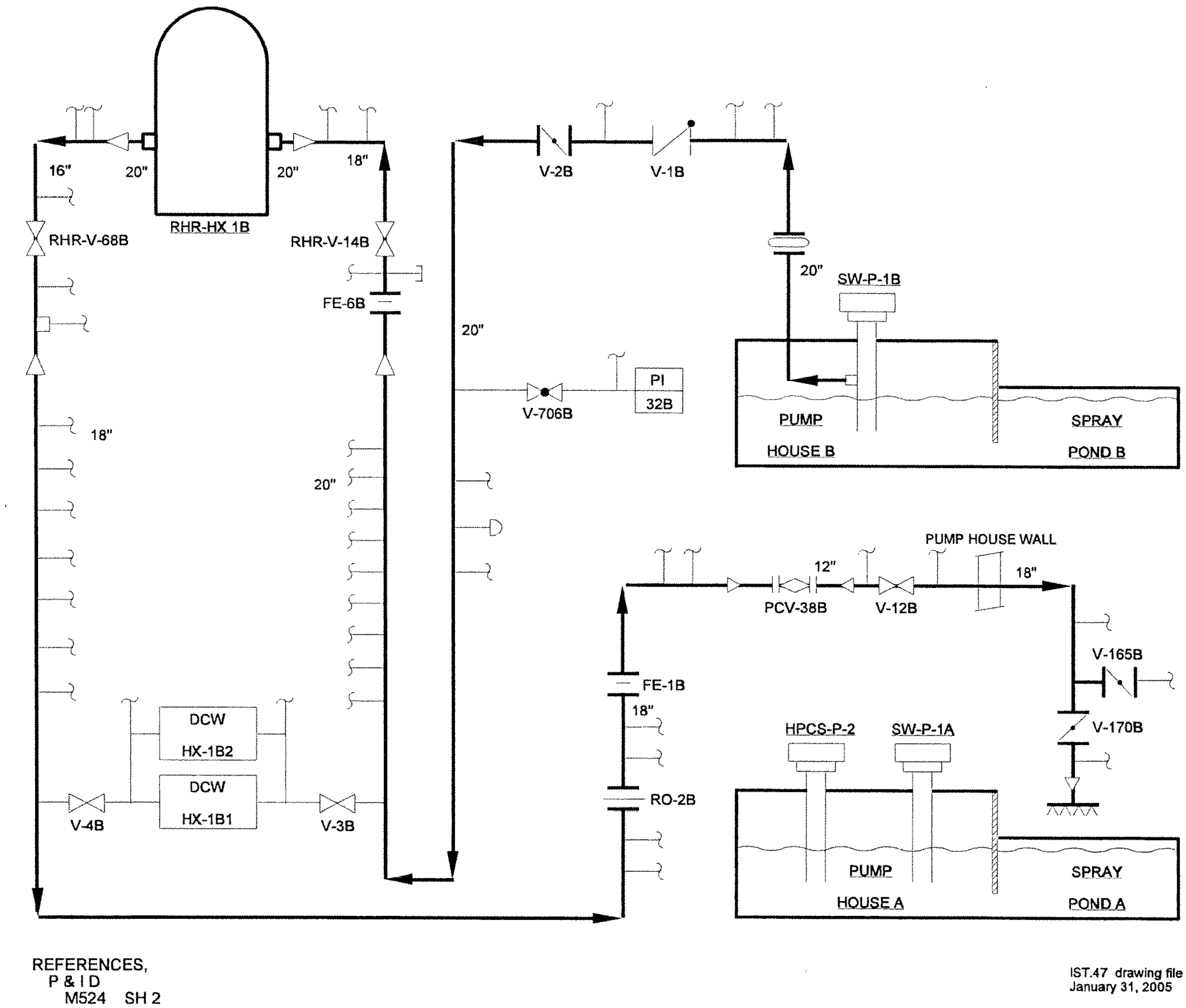
STANDBY LIQUID CONTROL

SW-P-1A PUMP TEST FLOW PATH



SERVICE WATER

SW-P-1B PUMP TEST FLOW PATH



4.6 Records and Reports of Pumps

Records and reports of pumps in the Program will be maintained in accordance with OM Code Subsection ISTB, Paragraph ISTB-9000. The files will contain the following:

4.6.1 Pump records will be maintained in accordance with Paragraph ISTB-9100.

4.6.2 Inservice test plans include pump surveillance test procedures. The inservice testing records for pumps in the Program will be maintained in accordance with Paragraph ISTB-9200.

4.6.3 Records of tests for pumps in the Program will be maintained in accordance with Paragraph ISTB-9300. Completed surveillance test procedures are retained per Plant Administrative Procedures.

4.6.4 Records of corrective actions for pumps in the Program will be maintained in accordance with Paragraph ISTB-9400. Corrective actions are documented on Work Orders (WO) and/or Condition Reports (CRs).

The Pump Inservice Test Program, associated surveillance test procedures and results, and corrective actions are retained per Plant Administrative Procedures. For informational purposes, a sample pump test data sheet is provided.

SAMPLE DATA SHEET - Group A Test
PUMP OPERABILITY DATA SHEET FOR RHR-P-2A

Test Parameters	Units	Refer Value	Action Lo (+1)	Alert Lo (+1)	Measured Value	Action Hi (+1)
Driver Lubrication	N/A	SAT	N/A	N/A		UNSAT
Upper Thrust Bearing Temperature per W139	°F	152	N/A	N/A		N/A
Lower Guide Bearing Temperature per W140	°F	109	N/A	N/A		N/A
Pump Lubrication	N/A	SAT	N/A	N/A		UNSAT
SW Flow per SW-FI-17A2	GPM	7	N/A	N/A		N/A
Suction Pressure at Test Flow per Test Gauge	PSIG	16	9.2	N/A		N/A
Discharge Pressure per TDAS X155	PSIG	135.87	(+5)	N/A		N/A
Diff. Press (Disch. Press. - Suction Press. per Test Gauge)	PSID	120.57	(+2)	(+3)		(+2)
Indicated Flowrate per TDAS X163	GPM (+4)	7500	#7493	N/A		N/A
Fluid Temperature per CMS-TR-5 or TR-6, PT220	°F	70	N/A	N/A		N/A
Motor Voltage per SM7 Volts	VAC	4140	N/A	N/A		N/A
Motor Current per RHR-P-2A Meter	AMP	89	N/A	N/A		N/A

(+1) For measured values beyond the Alert Value or Action Value refer to Precaution and Limitations 4.5 or 4.6, respectively.

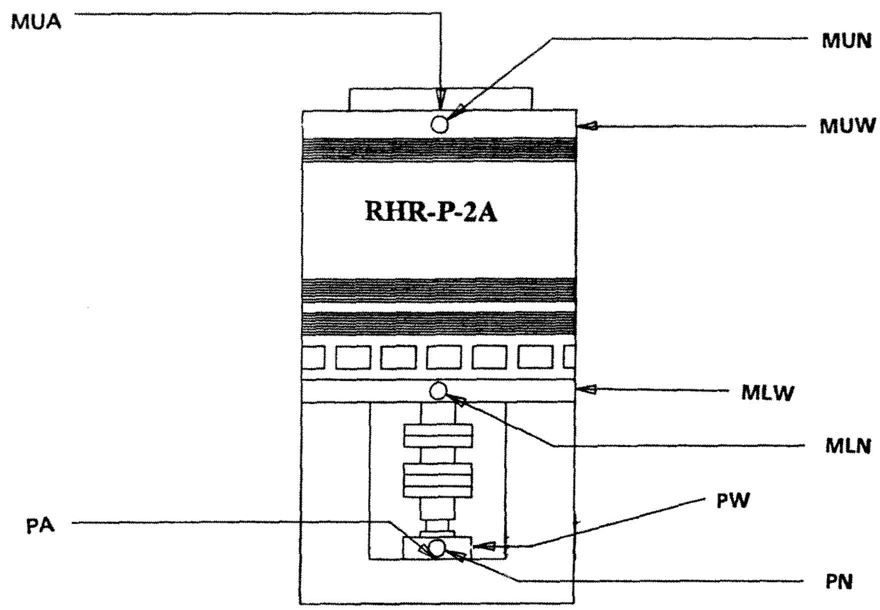
(+2) The ACTION RANGE is defined as outside the area described by points 1, 2, 3 and 4 on Attachment 9.4.

(+3) The ALERT RANGE is defined as inside the area described by points 3, 4, 5 and 6 on Attachment 9.4.

(+4) Indicated flow GE 7493 gpm provides actual flow GT 7450 gpm (Tech. Spec. Limit) for fluid temperature GE 40°F. {P-91709}

(+5) Discharge pressure is required to be GE the corrected discharge pressure for the flow listed in Attachment 9.6.

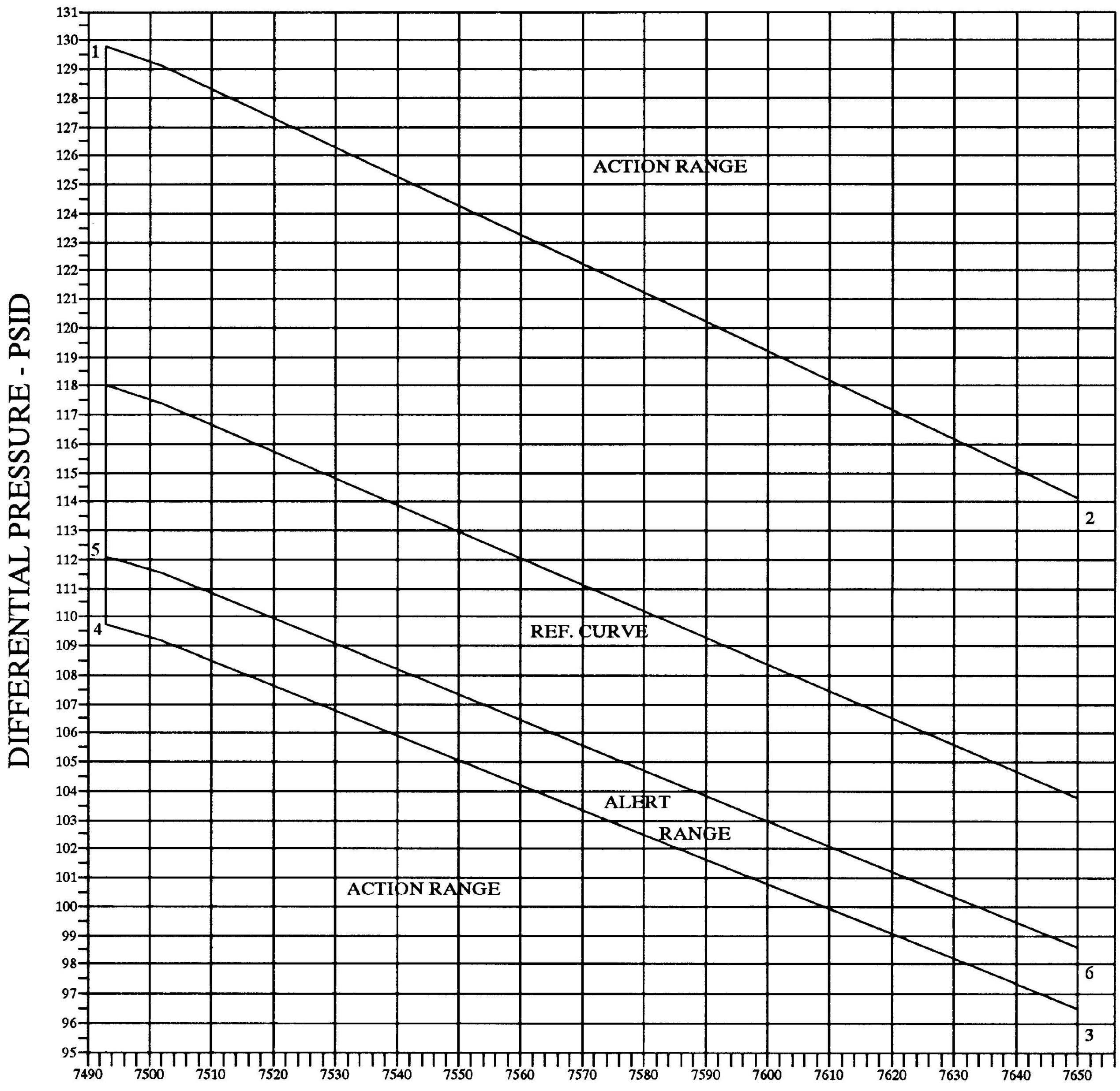
SAMPLE DATA SHEET
VIBRATION DATA SHEET FOR RHR-P-2A



	PROBE LOCATION	VIBRATION VELOCITY (IN/SEC) REFER VALUE	MEASURED VALUE	ALERT HI (+1)	ACTION HI (+1)
ASME	MUA	0.071		0.178	0.426
	MUN	0.152		0.325	0.700
	MUW	0.082		0.205	0.492
NON-ASME	MLN	0.048		N/A	N/A
	MLW	0.042		N/A	N/A
	PA	0.155		N/A	N/A
	PN	0.082		N/A	N/A
	PW	0.037		N/A	N/A

\# (+1) For measured values beyond the Alert Value or Action Value refer to Precaution and Limitations 4.5 or 4.6, respectively.

SAMPLE DATA SHEET - Group A Test
RHR-P-2A ACCEPTANCE CRITERIA



ALERT RANGE = Area Inside 3-4-5-6 ACTION RANGE = Area Outside 1-2-3-4

4.7 Technical Positions

Technical Position – **TP01**

Pump	Code Class	P&ID Dwg. Number	System(s)
HPCS-P-1	2	M520	High Pressure Core Spray
HPCS-P-2	3	M524, SH 1	Standby Service Water HPCS
LPCS-P-1	2	M520	Low Pressure Core Spray
RHR-P-2A	2	M521 SH 1	Residual Heat Removal
RHR-P-2B	2	M521 SH 2	Residual Heat Removal
RHR-P-2C	2	M521 SH 3	Residual Heat Removal
SW-P-1A	3	M524 SH 1	Standby Service Water
SW-P-1B	3	M524 SH 2	Standby Service Water

<u>Title</u>

Vertical Line Shaft Pumps (Listed Above).

<u>Issue Discussion</u>

ISTB-2000, Supplemental Definitions. Defines a vertical line shaft pump as a vertically suspended pump where the pump driver and pump element are connected by a line shaft within an enclosed column.

<u>Position</u>

Traditionally a vertical line shaft (VLS) pump as defined by the OM Code, Subsection ISTB-2000, is a vertically suspended pump where the pump driver and pump element are connected by a line shaft within an enclosed column. The primary concern associated with a VLS pump in regards to inservice testing is the inability to perform vibration measurements near the pump end of the component. Typically, many VLS pumps have 20 or 30 foot shafts connecting the driver to the pump and therefore vibration measurements and, in many cases, hydraulic measurements are difficult and not representative of the condition of the machine. As a means to "compensate" for this weakness in IST, the OM Code has developed guidance along with more conservative measurement criteria and parameters to provide additional methods in ascertaining the operational readiness of VLS pumps. The acceptance criteria for VLS pumps is also more restrictive to allow for action to be taken conservatively regarding the degradation or potential degradation of the VLS pumps.

At the Columbia Generating Station, there are several pumps designated as VLS (as shown above), which may not satisfy, in the traditional sense, the definition of a VLS pump. However, upon review and evaluation of the design of the pumps with regards to the "IST concern" associated with Code defined VLS pumps, it has been determined at the Columbia Generating Station, to consider all of the pumps listed above as VLS pumps. All of the above listed pumps have a discharge head which supports the pumping element that is inaccessible to vibration measurements. As such, the above listed pumps meet the VLS testing methodology and acceptance criteria as stated in the OM Code. The Pump Inservice Test Table provides a complete listing of the pumps and their designations.

Technical Position – **TP02**

Pump	Code Class	P&ID Dwg. Number	System(s)
DO-P-1A	3	M512, SH 4	Diesel Fuel Oil Transfer
DO-P-1B	3	M512, SH 4	
DO-P-2	3	M512, SH 4	

Title

Classification of diesel fuel oil transfer pumps as skid mounted components.

Issue Discussion

ASME OM Code 2004 Edition through 2006 addenda, Section ISTA-2000, defines skid mounted pumps and valves as follows:

"Pumps and valves integral to or that support operation of major components, even though these pumps and valves may not be located directly on the skid. In general, these pumps and valves are supplied by the manufacturer of the major component. Examples include:

(a) diesel fuel oil pumps and valves;
(b) steam admission and trip throttle valves for high-pressure coolant injection turbine-driven pumps;
(c) steam admission and trip throttle valves for auxiliary feedwater turbine-driven pumps;
(d) solenoid-operated valves provided to control an air-operated valve."

Per ISTB-1200(c), skid mounted pumps that are tested as part of the major component and are justified by the Owner to be adequately tested, can be excluded from the testing requirements of subsection ISTB.

NUREG-1482, Revision 2 Section 3.4 states that the NRC staff has determined that the testing of the major component is an acceptable means to verify the operational readiness of the skid-mounted components and component subassemblies if the licensee documents this approach in the IST Program. This is acceptable for both Code class components and non-Code class components that are tested and tracked by the IST Program.

Position

These pumps are classified as skid mounted pumps and are adequately tested as a part of the diesel generator system and are exempt from the testing requirements of subsection ISTB.

These pumps support operation of the Emergency Diesel Generators 1, 2 and HPCS by maintaining adequate fuel oil levels in each day tank.

These pumps are adequately tested per the following requirements:

Technical Specification surveillance SR 3.8.1.6 demonstrates that each required fuel oil transfer pump operates and automatically transfers fuel oil from its associated storage tank to its associated day tank each quarter. This surveillance provides assurance that the fuel oil transfer pump is operable, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control system for automatic fuel transfer systems are operable. The monthly Technical Specification surveillance SR

3.8.1.4 verifies that each day tank contains GE 1400 gallons of fuel oil. This SR provides verification that the level of fuel oil in the day tank is at or above the level at which the low level alarm is annunciated. During the 24-hour DG run surveillance (SR 3.8.1.14) the fuel oil transfer pump cycles between the low and high day tank levels to keep up with the fuel consumption. These tests provide reasonable assurance that any mechanical or electrical deficiency will be detected and corrected before it can result in failure of an emergency power supply to respond when called upon to function.

The actual flow rate for the diesel fuel oil transfer pumps is several times the maximum engine consumption rate (of 110% load) and is automatically controlled by level switches activated by the day tank fuel level. The maximum fuel oil consumption rate for diesel generator 1 and 2 is 340 gallons per hour and for the HPCS diesel generator is 200 gallons per hour. Even a large reduction in a pump flow rate will not affect system operability.

Additional testing for pump degradation will be performed annually at the Owner’s discretion. This test will include flow rate, differential pressure and vibration measurments. Any anomalies will be captured under the corrective action program.

References

1. FSAR 9.5.4, Diesel Generator Fuel Oil Storage and Transfer System
2. OSP-DO/IST-Q701, Q702, Q703.
3. OSP-ELEC-M701, 702, 703.
4. TSP-DG1-B502, TSP-DG2-B502, TSP-DG3-B502.

4.8 Relief Requests from Certain General and Subsection ISTB Requirements

Relief Requests either provide alternative to Code requirements in accordance with 10 CFR 50.55a(a)(3)(i) and/or 10 CFR 50.55a(a)(3)(ii) or relief from impractical Code requirements in accordance with 10 CFR 50.55a(f)(5)(iii). They provide technical justification and propose alternate testing to be performed in lieu of the Code required testing.

Relief Request – **RG01**

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(ii)

– Hardship or Unusual Difficulty Without Compensating increase in Level of Quality and Safety –

ASME Code Components Affected

All Pumps and Valves contained within the Inservice Testing Program scope.

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

This request applies to the frequency specifications of the ASME OM Code. The frequencies for tests given in the ASME OM Code do not include a tolerance band.

ISTA-3120(a)	Inservice Testing Interval. The frequency for the inservice testing shall be in accordance with the requirements of Section IST.
ISTB-3400	Frequency of Inservice Tests. An inservice test shall be run on each pump as specified in Table ISTB-3400-1.
ISTC-3510	Exercising Test Frequency. Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222. Power-operated relief valves shall be exercise tested once per fuel cycle.
ISTC-3540	Manual Valves. Manual valves shall be full-stroke exercised at least once every 2 years, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness. Any increased testing frequency shall be specified by the Owner. The valve shall exhibit the required change of obturator position.
ISTC-3630 (a)	Leakage Rate for Other Than Containment Isolation Valves. Frequency. Tests shall be conducted at least once every 2 years.
ISTC-3700	Position Verification Testing. Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated.
ISTC-5221(c)(3)	Valve Obturator Movement. At least one valve from each group shall be disassembled and examined at each refueling outage; all valves in a group shall be disassembled and examined at least once every 8 years.

Relief Request – **RG01** (Contdd.)

ISTC-5260	Explosively Actuated Valves. (b) Concurrent with the first test and at least once every 2 years, the service life records of each valve shall be reviewed to verify that the service life of the charges have not been exceeded and will not be exceeded before the next refueling. (c) At least 20% of the charges in explosively actuated valves shall be fired and replaced at least once every 2 years.
Appendix I, I-1320(a)	Test Frequencies, Class 1 Pressure Relief Valves. 5-Year Test Interval. Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24 month interval.
Appendix I, I-1330	Test Frequency, Class 1 Nonreclosing Pressure Relief Devices. Class 1 nonreclosing pressure relief devices shall be replaced every 5 years unless historical data indicates a requirement for more frequent replacement.
Appendix I, I-1340	Test Frequency, Class 1 Pressure Relief Valves that are used for Thermal Relief Application. Tests shall be performed in accordance with I-1320, Test Frequencies, Class 1 Pressure Relief Valves.
Appendix I, I-1350 (a)	Test Frequency, Class 2 and 3 Pressure Relief Valves. 10-Year Test Interval. Classes 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every 10 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested during any single plant operating cycle; however, a minimum of 20% of the valves from each valve group shall be tested within any 48 month interval.
Appendix I, I-1360	Test Frequency, Class 2 and 3 Nonreclosing Pressure Relief Devices. Classes 2 and 3 nonreclosing pressure relief devices shall be replaced every 5 years, unless historical data indicates a requirement for more frequent replacement.
Appendix I, I-1370	Test Frequency, Class 2 and 3 Primary Containment Vacuum Relief Valves. (a) Tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at each refueling outage or every 2 years, whichever is sooner, unless historical data requires more frequent testing. (b) Leak tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at a frequency designated by the Owner in accordance with Table ISTC-3500-1.

Relief Request – **RG01** (Contdd.)

Appendix I, I-1380	Test Frequency, Classes 2 and 3 Vacuum Relief Valves, Except for Primary Containment Vacuum Relief Valves. All Classes 2 and 3 vacuum relief valves shall be tested every 2 yr, unless performance data suggest the need for a more appropriate test interval.
Appendix I, I-1390	Test Frequency, Classes 2 and 3 Pressure Relief Devices That Are Used for Thermal Relief Application. Tests shall be performed on all Classes 2 and 3 relief devices used in thermal relief application every 10 yr, unless performance data indicate more frequent testing is necessary. In lieu of tests the Owner may replace the relief devices at a frequency of every 10 yr, unless performance data indicate more frequent replacements are necessary.
Appendix II, II-4000	Performance Improvement Activities. (a)(1) If sufficient information is not currently available to complete the analysis required in II-3000, or if this analysis is inconclusive, then the following activities shall be performed at sufficient intervals over an interim period of the next 5 years or two refueling outages, whichever is less, to determine the cause of the failure or the maintenance patterns. (e) Identify the interval of each activity.
Appendix II, II-4000	Optimization of Condition Monitoring Activities. (b)(1)(e) Identify the interval of each activity. Interval extensions shall be limited to one fuel cycle per extension. Intervals shall not exceed the maximum intervals shown in Table II-4000-1. All valves in a group sampling plan must be tested or examined again, before the interval can be extended again, or until the maximum interval would be exceeded. The requirements of ISTA-3120, Inservice Test Interval, do not apply.
MOV Diagnostic Tests	GL 96-05 required periodic static and dynamic diagnostic test intervals. A MOV Program is required by condition 10CFR 50.55a(b)(3)(ii).

Reason for Request

Pursuant to 10 CFR 50.55a, “Codes and standards,” paragraph (a)(3)(ii), relief is requested from the frequency specifications of the ASME OM Code. The basis of the relief request is that the Code requirement presents an undue hardship without a compensating increase in the level of quality of safety.

Relief Request – **RG01** (Contd.)

ASME OM Code Section IST establishes the IST frequency for all components within the scope of the Code. The frequencies (e.g., quarterly) have always been interpreted as “nominal” frequencies (generally as defined in the Table 3.2 of NUREG-1482, Revision 2) and Owners routinely applied the surveillance extension time period (i.e., grace period) contained in the plant Technical Specifications (TS) Surveillance Requirements (SRs). The TSs typically allow for a less than or equal to 25% extension of the surveillance test interval to accommodate plant conditions that may not be suitable for conducting the surveillance (SR 3.0.2).

However, regulatory issues have been raised concerning the applicability of the Technical Specification (TS) “grace period” to ASME OM Code required IST frequencies irrespective of allowances provided under TS Administrative Controls (i.e., TS 5.5.6, “Inservice Testing Program,” invokes Surveillance Requirements (SR) 3.0.2 for various OM Code frequencies).

The lack of a tolerance band on the ASME OM Code IST frequency restricts operational flexibility. There may be a conflict where IST could be required (i.e., its frequency could expire), but where it is not possible or not desired that it be performed until after a plant condition or associated Limiting Condition for Operation (LCO) is within its applicability. Therefore, to avoid this conflict, the IST should be performed when it can and should be performed.

The NRC recognized this potential issue in the TS by allowing a frequency tolerance as described in TS SR 3.0.2. The lack of a similar tolerance applied to the ASME OM Code testing places an unusual hardship on the plant to adequately schedule work tasks without operational flexibility.

Thus, just as with TS required surveillance testing, some tolerance is needed to allow adjusting ASME OM Code testing intervals to suit the plant conditions and other maintenance and testing activities. This assures operational flexibility when scheduling IST that minimizes the conflicts between the need to complete the testing and plant conditions.

Proposed Alternative and Basis for Use

Columbia Generating Station proposes to use the ASME OM Code Case OMN-20 as published in ASME OM-2012 edition for the fourth ten year interval of IST Program. The 2012 edition of Operation and Maintenance of Nuclear Power Plants, was approved by the ASME Board on Nuclear Codes and Standards on December 21, 2012. Code case OMN-20 will be used for determining acceptable tolerances for pump and valve testing frequencies. The code case as published in ASME OM-2012 edition is repeated below.

Published OMN-20 Code Case

1 TEST FREQUENCY GRACE

ASME OM, Division1, Section IST and all earlier editions and addenda specify component test frequencies based either on elapsed time periods (e.g., quarterly, 2 years, etc.) or the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.).

Relief Request – **RG01** (Contd.)

(a) Components whose test frequencies are based on elapsed time periods shall be tested at the frequencies specified in Section IST with a specified time period between tests as shown in Table 1. The specified time period between tests may be reduced or extended as follows:

1) For periods specified as fewer than 2 yr, the period may be extended by up to 25% for any given test.

2) For periods specified as greater than or equal to 2 yr, the period may be extended by up to 6 mo for any given test.

3) All periods specified may be reduced at the discretion of the owner (i.e., there is no minimum period requirement).

Period extension is to facilitate test scheduling and considers plant operating conditions that may not be suitable for performance of the required testing (e.g., performance of the test would cause an unacceptable increase in the plant risk profile due to transient conditions or other ongoing surveillance, test, or maintenance activities). Period extensions are not intended to be used repeatedly merely as an operational convenience to extend test intervals beyond those specified.

Period extensions may also be applied to accelerated test frequencies (e.g., pumps in alert range) and other less than 2 yr test frequencies not specified in Table 1.

Period extensions may not be applied to the test frequency requirements specified in Subsection ISTD, Preservice and Inservice Examination and Testing of Dynamic Restraints (Snubbers) in Light-water Reactor Nuclear Power Plants, as Subsection ISTD contains its own rules for period extensions.

(b) Components whose test frequencies are based on the occurrence of plant conditions or events may not have their period between tests extended excepts as allowed by ASME OM, Division 1, Section IST, 2009 Edition through OMa-2011 Addenda and all earlier editions and addenda.

Table 1 Specified Test Frequencies

Frequency	Specified Time Period Between Tests
Quarterly (or every 3 months)	92 days
Semiannually (or every 6 months)	184 days
Annually (or every year)	366 days
X Years	X calendar years Where X is a whole number of years $\geq$ 2

Relief Request – **RG01** (Contdd.)

Quality/Safety Impact

Allowing use of the code case OMN-20 will provide reasonable assurance of operational readiness of pumps and valves subject to ASME OM code 2004 edition through OMb-2006 addenda testing requirements.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

The following similar relief requests for Quad Cities Unit 1 and 2, and Three Mile Island Unit 1 were approved by the NRC.

Request Number RV-01 for Quad Cities Units 1 and 2 was approved by the NRC by letter dated February 14, 2013 (ADAMS Accession Number ML13042A348).

Request Number VR-02 for Three Mile Island Unit 1 was approved by the NRC by letter dated August 15, 2013 (ADAMS Accession number ML13227A024).

References

1. Code Case OMN-20, Inservice Test Frequency, published in ASME OM-2012 Edition.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP01**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

– Alternative Provides Acceptable Level of Quality and Safety –

ASME Code Components Affected

Pump	Code Class	Pump Group	P & ID Dwg. No.	System(s)
SW-P-1A	3	A	M524, SH 1	Standby Service Water
SW-P-1B	3	A	M524, SH 2	Standby Service Water
HPCS-P-2	3	A	M524, SH 1	Standby Service Water, HPCS

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

Measure pump differential pressure, ΔP. Vertical line shaft centrifugal pumps preservice and inservice testing (ISTB-5210, ISTB-5220, and Table ISTB-3000-1). Relief is required for Group A and comprehensive and preservice tests.

Reason for Request

There are no inlet pressure gauges installed in the inlet of these vertical line shaft centrifugal pumps, making it impractical to directly measure inlet pressure for use in determining differential pressure for the pump.

Proposed Alternative and Basis for Use

Pump discharge pressure will be recorded during the testing of these pumps. Code Acceptance Criteria will be based on discharge pressure instead of differential pressure as specified in the Code Table ISTB-5221-1. The effect of setting the Code Acceptance Criteria on discharge pressure instead of differential pressure as specified in the Code will have no negative impact on detecting pump degradation.

1. SW-P-1A, 1B, and HPCS-P-2 are vertical line shaft centrifugal pumps which are immersed in their water source. They have no suction line which can be instrumented.

2. Technical Specification SR 3.7.1.1 specifies the minimum allowable spray pond level to assure adequate NPSH and ultimate heat sink capability.

3. The difference between allowable minimum and overflow pond level is only 21 inches of water or 0.8 pounds per square inch (psi). This small difference will not be significant to the Test Program and suction pressure will be considered constant. Administratively, the pond level is controlled within a nine (9) inch band.

Relief Request – **RP01** (Contd.)

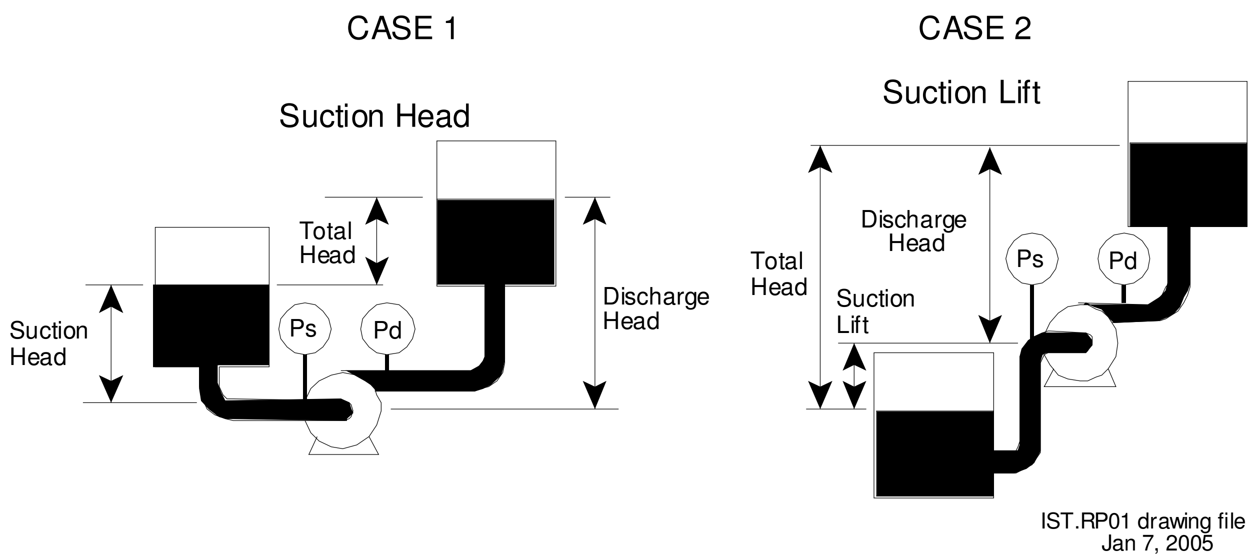
4. Acceptable flow rate and discharge pressure will suffice as proof of adequate suction pressure.

5. These pumps operate with a suction lift. Maximum elevation of spray pond level is 434 feet 6 inches and minimum elevation of discharge piping for these pumps is 442 feet 5/8 inches. Thus discharge pressure for these pumps will always be lower than the calculated differential pressure for the entire range of suction pressures. Thus acceptance criteria based on discharge pressure is conservative. This is further illustrated below.

   Differential pressure is defined as discharge pressure minus suction pressure. In the case of a pump with suction lift the suction pressure is negative, thus:

$$\Delta P = P_d - (- P_s)$$
$$\Delta P = P_d + Ps$$

   This concept is more easily understood when head is used instead of pressure.



Relief Request – **RP01** (Contd.)

The ASME Code uses the term differential pressure instead of total head since differential pressure is required to be measured. However, most literature on pumps deals with hydraulic parameters in terms of head and flow. In case 1:

Total Head = Discharge Head - Suction Head

But in Case 2 (Service Water Pumps)

Total Head = Discharge Head + Suction Lift

When one converts head to pressure, the equivalent formula for differential pressure would be:

$\triangle P(psi) = P_d(psi) + 0.431(psi/ft)x(EL_{pump}\ (ft) - EL_{water\ level}(ft))$

Since pump discharge pipe elevation for these pumps is always more than spray pond water level, discharge pressure is always less than the calculated differential pressure.

Quality/Safety Impact

The effect of setting the Code Acceptance Criteria on discharge pressure instead of differential pressure as specified in the Code provides a more conservative test methodology.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

This relief was granted for the third 10 year interval. NRC approval was documented in a letter dated May 15, 2007 (ADAMS Accession Number ML 071010344, TAC No. MD3536) for Relief Request No. RP01.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP02**

Relief Request
in Accordance with 10 CFR 50.55a(f)(5)(iii)

– Inservice Testing Impracticality –

ASME Code Components Affected

Pump	Code Class	Pump Group	P&ID Dwg. Number	System(s)
SW-P-1A	3	A	M524, SH 1	Standby Service Water
SW-P-1B	3	A	M524, SH 2	Standby Service Water
HPCS-P-2	3	A	M524, SH 1	Standby Service Water, HPCS

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

Subsection ISTB-5221(b) and ISTB-5223(b). The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to the reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value.

Relief is required for Group A and Comprehensive Pump Tests.

Impracticality of Compliance

The establishment of specific reference values is impractical for these vertical line shaft centrifugal pumps.

Burden Caused by Compliance

1. Service Water systems are designed such that the total pump flow cannot be adjusted to one finite value for the purpose of testing without adversely affecting the system flow balance and Technical Specification operability requirements. Thus, these pumps must be tested in a manner that the Service Water loop remains properly flow balanced during and after the testing and each supplied load remains fully operable to maintain the required level of plant safety.

Relief Request – **RP02** (Contd.)

2. The Service Water system loops are not designed with a full flow test line with a single throttle valve. Thus the flow cannot be throttled to a fixed reference value. Total pump flow rate can only be measured using the total system flow indication installed on the common return header. Although there are valves in the common return line that are used for throttling total system flow during pre-service testing, use of these valves is impractical for regular testing due to the potential effect on the flow balance for the safety related loads. Each main loop of service water supplies 17-18 safety related loads, all piped in parallel with each other. The HPCS-P-2 pump loop supplies four loads, each in parallel. Each pump is independent from the others (i.e., no loads are common between the pumps). Each load is throttled to a calculation and surveillance required flow range which must be satisfied for the loads to be operable. All loads are aligned in parallel, and all receive service water flow when the associated service water pump is running, regardless of whether the served component itself is in service. During power operation, all loops (subsystems) of service water are required to be operable per Technical Specifications. A loop of service water cannot be taken out of service for testing without entering an Action Statement for a Limiting Condition for Operation (LCO) per Technical Specification 3.7.1.

3. Each loop of Service Water is flow balanced annually to ensure that all loads are adequately supplied. A flow range is specified for each load. Once properly flow balanced, very little flow adjustment can be made for any one particular load without adversely impacting the operability of the remaining loads (increasing flow for one load reduces flow for all the others). Each time the system is flow balanced, proper individual component flows are produced, but this in turn does not necessarily result in one specific value for total flow. Because each load has an acceptable flow range, overall system full flow (the sum of the individual loads) also has a range. Total system flow can conceivably be in the ranges of approximately 9,200 - 10,200 gallons per minute (gpm) for SW-P-1A and SW-P-1B pumps and approximately 961 - 1,203 gpm for HPCS-P-2 pump. Consequently, the requirement to quarterly adjust service water loop flow to one specific flow value for the performance of inservice testing conflicts with system design and component operability requirements (i.e., flow balance) as required by Technical Specification.

Proposed Alternative and Basis for Use

As discussed above, it is impractical to return to a specific value of flow rate or discharge pressure for testing of these pumps. As stated in NUREG-1482, Rev 2 Section 5.2, some system designs do not allow for testing at a single reference point or a set of reference points. In such cases, it may be necessary to plot pump curves to use as the basis for variable reference points. Code Case OMN-16,"Use of a Pump Curves for Testing," is included in draft Revision 1 of Regulatory Guide (RG) 1.192,"Operations and Maintenance Code Case Acceptability, ASME OM Code." Flow rate and discharge pressure are measured during inservice testing and compared to an established reference curve. Discharge pressure instead of differential pressure is used to determine pump operational readiness as described in Relief Request RP01. All requirements specified in Code Case OMN-16 will be followed in developing and implementing the reference pump curves. The following information is provided for existing pump curves developed during the third ten year test interval.

1. SW-P-1A and SW-P-1B were replaced with new pumps in 2005 and HPCS-P-2 was replaced in 2008. A preservice test as required by the ASME OM Code was performed and a reference pump curve (flow rate vs. discharge pressure) was established for all three pumps using the preservice test data.

Relief Request – **RP02** (Contd.)

2. Pump curves are based on five or more test points beyond the flat portion of the curve (between 6000 gpm and 10200 gpm for SW-P-1A and 1B pumps and between 650 and 1200 gpm for HPCS-P-2 pump). The pumps are being tested near full design flow rate.

3. Temporary test gauges (± 0.5% full scale accuracy) were installed to take discharge pressure test data in addition to plant installed gauges and Transient Data Acquisition System (TDAS). TDAS data averages 100 readings with a reading taken each second. All instruments used either met or exceeded the Code required accuracy for Group A and comprehensive pump test.

4. The reference pump curves are based on flow rate vs. discharge pressure. Acceptance criteria curves are based on differential pressure limits given in Table ISTB-5121-1 for applicable test type. Setting the Code Acceptance Criteria on discharge pressure using differential limits is slightly more conservative for these pump installations with suction lift (Relief Request RP01). See the attached sample SW-P-1A pump Acceptance Criteria sheet for Group A test. Area 1-2-5-6 is the acceptable range for pump performance. Area 3-4-5-6 defines the Alert Range, and the area outside 1-2-3-4 defines the required Action Range.

5. Similar reference curves are used for comprehensive pump tests using the applicable acceptance criteria and instrument accuracy and range requirements.

6. Only a small portion of the established reference curve is being used to bind the flow rate variance due to flow balancing of various system loads. See the attached sample SW-P-1A pump Acceptance Criteria sheet for Group A test.

7. A single reference value shall be assigned for each vibration measurement location. The selected reference value shall be at the minimum data over the narrow range of pump curves being used as required by Code Case OMN-16.

8. When the repair, replacement, or routine servicing of a pump may have affected a reference curve, a new reference curve shall be determined, or the existing reference curve reconfirmed, in accordance with para. 16-3310 of Code Case OMN-16.

9. If it is necessary or desirable, for some reason other than that stated in para. 16-3310 of Code Case OMN-16, to extend the current pump curve or establish an additional reference curve, the new curve(s) must be determined in accordance with para. 16-3320 of Code Case OMN-16.

Quality/Safety Impact

The design of the Columbia Generating Station Service Water system and the Technical Specification requirements make it impractical to adjust system flow to a fixed reference value for inservice testing without adversely affecting the system flow balance and Technical Specification operability requirements. The proposed alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and shall adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

Relief Request – **RP02** (Contd.)

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

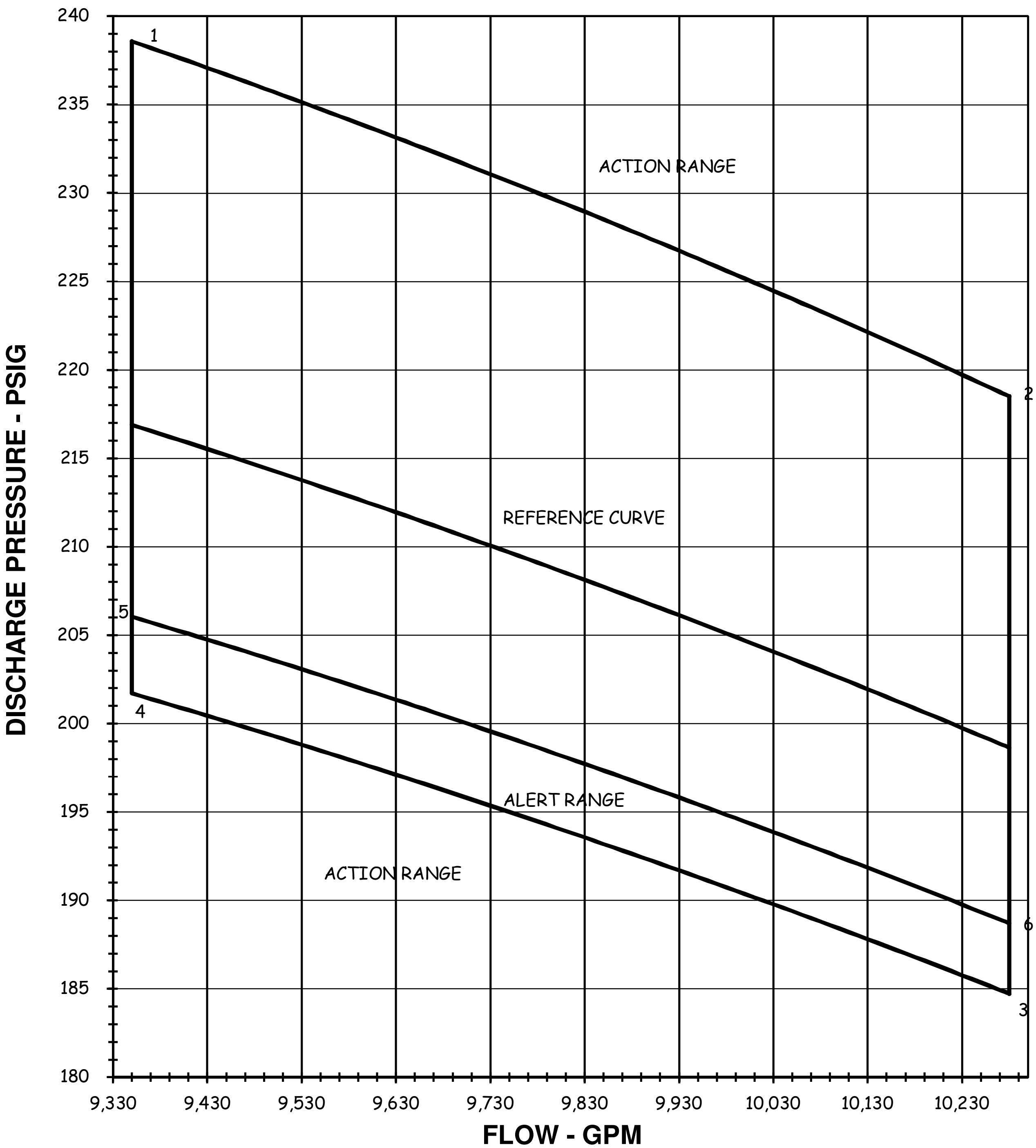
Similar relief was granted for the third 10 year interval. NRC approval was documented in a letter dated May 15, 2007 (ADAMS Accession Number ML 071010344, TAC No. MD3540) for Relief Request No. RP03.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP02** (Contd.)

SAMPLE DATA SHEET - Group A Test
SW-P-1A ACCEPTANCE CRITERIA



ALERT RANGE = Area Inside 3-4-5-6

ACTION RANGE = Area Outside 1-2-3-4

Relief Request – **RP03**

Relief Request
in Accordance with 10 CFR 50.55a(f)(5)(iii)

– Inservice Testing Impracticality –

ASME Code Components Affected

Pump	Code Class	Pump Group	P&ID Dwg. Number	System(s)
LPCS-P-1	2	B	M520	Low Pressure Core Spray
RHR-P-2A	2	A	M521, SH 1	Residual Heat Removal
RHR-P-2B	2	A	M521, SH 2	
RHR-P-2C	2	A	M521, SH 3	
HPCS-P-1	2	B	M520	High Pressure Core Spray
RCIC-P-1	2	B	M519	Reactor Core Isolation Cooling

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

RCIC-P-1 (Centrifugal Pump):

Group B Test: Subsection ISTB-5122(a), ISTB-5122(b) and ISTB-5122(c). The pump shall be operated at a speed adjusted to the reference point (+/- 1%) for variable speed drives. The differential pressure or flow rate shall be determined and compared to its reference value. System resistance may be varied as necessary to achieve the reference point.

Comprehensive Test: Subsection ISTB-5123(a) and ISTB-5123(b). The pump shall be operated at a speed adjusted to the reference point (+/- 1%) for variable speed drives. The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value.

Other Pumps (Vertical line Shaft Centrifugal Pumps):

Group B Test for LPCS-P-1 and HPCS-P-1: Subsection ISTB-5222(b) and ISTB-5222(c). The differential pressure or flow rate shall be determined and compared to its reference value. System resistance may be varied as necessary to achieve the reference point.

Group A Test for RHR-P 2A, 2B AND 2C and Comprehensive Test for all pumps except RCIC-P-1: Subsection ISTB-5221(b) and ISTB-5223(b). The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value.

Relief Request – **RP03** (Contd.)

Impracticality of Compliance

The establishment of specific reference values is impractical for these pumps.

Burden Caused by Compliance

Reference values are defined as one or more fixed sets of values of quantities as measured or observed when the equipment is known to be operating acceptably. All subsequent test results are to be compared to these reference values. Based on operating experience, flow rate (independent variable during inservice testing) for these pumps cannot be readily duplicated with the existing flow control systems. Flow control for these systems can only be accomplished through the operation of relatively large motor operated globe valves as throttling valves. The operator must repeatedly jog the motor operator to try to make even minor adjustments in flow rate. These efforts, to exactly duplicate the reference value, would require excessive valve manipulation which could ultimately result in damage to valves or motor operators.

Proposed Alternative and Basis for Use

As discussed above, it is impractical to return to a specific value of flow rate, or differential pressure for testing of these pumps. As stated in NUREG-1482, Rev 2 Section 5.2, some system designs do not allow for testing at a single reference point or a set of reference points. In such cases, it may be necessary to plot pump curves to use as the basis for variable reference points. Code Case OMN-16,"Use of a Pump Curves for Testing," is included in draft Revision 1 of RG 1.192,"Operations and Maintenance Code Case Acceptability, ASME OM Code."

Since the independent reference variable (flow rate) for these pumps is impractical to adjust to a fixed reference value and requires excessive valve manipulation, the maximum variance shall be limited to ± 2% of the reference value. Thus, flow rate shall be adjusted to be within ± 2% of the reference flow rate and the corresponding differential pressure shall be measured and compared to the reference differential pressure value determined from the pump reference curve established for this narrow range of flow rate. Slope of the pump reference curve is not flat even over this narrow range of flow rate. Assuming the flow rate to be fixed over this narrow range can result in additional error in calculating the deviation between the measured and reference differential pressure and at times this deviation can be non-conservative. Since the dependent variable (differential pressure) can be assumed to vary linearly with flow rate in this narrow range, establishing multiple reference points in this narrow range is similar to establishing a reference pump curve representing multiple reference points. This assumption of linearity between differential pressure and flow rate is supported by the manufacturer pump curves in the stable design flow rate region.

The following elements are used in developing and implementing the reference pump curves. These elements follow all the requirements of Code Case OMN-16.

1. RHR-P-2B was replaced with a new pump in 2013. A preservice test as required by the ASME OM Code was performed and a reference pump curve (flow rate vs. differential pressure) was established for this pump using the preservice test data. A similar reference pump curve (flow rate vs differential pressure) has been established for RHR-P-2A and RHR-P-2C pumps from data taken on these pumps when they were known to be operating acceptably. These pump curves represent pump performance almost identical to manufacturer's test data.

Relief Request – **RP03** (Contd.)

2. For RCIC-P-1, a variable speed drive pump, flow rate is set within ± 2% of the reference flow rate and the reference curve is based on speed with acceptance criteria based on differential pressure. This is done because of the impracticality of setting speed to a specific reference value to achieve the desired flow rate and pump discharge pressure. See the attached sample RCIC-P-1 pump Acceptance Criteria sheet for Group B test. Additionally, evaluation of the manufacturer pump data, preoperational and special test data used to establish the pump reference curve indicates insignificant change in differential pressure with small variation in flow rate.

3. HPCS-P-1 was replaced with a new pump in 2007. A preservice test as required by the ASME OM Code was performed and a reference pump curve (flow rate vs. differential pressure) was established for this pump using the preservice test data.

4. For LPCS-P-1 pump, the reference pump curve is based on the manufacturer pump curve that was validated during preoperational testing using 5 or more test points beyond the flat portion of the curve.

5. Residual Heat Removal (RHR), High Pressure Core Spray (HPCS) and Reactor Core Isolation Cooling (RCIC) pump curves are based on five or more test points beyond the flat portion of the curve. These ECCS pumps have minimum flow rate requirements specified in Technical Specifications and are being tested near these flow rates.

6. Temporary test gauges (± 0.5% full scale accuracy) were installed to take suction and discharge pressure test data in addition to plant installed gauges and Transient Data Acquisition System (TDAS). TDAS data averages 100 readings with a reading taken each second. All instruments used either met or exceeded the Code required accuracy for applicable Group A, Group B and comprehensive pump test.

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

8. Acceptance criteria curves are based on differential pressure limits given in applicable Table ISTB-5121-1 or Table ISTB-5221-1. See the attached sample RHR-P-2A pump Acceptance Criteria sheet for Group A test. Area 1-2-5-6 is the acceptable range for pump performance. Area 3-4-5-6 defines the Alert Range and the area outside 1-2-3-4 defines the required Action Range. A similar sample RCIC-P-1 pump Acceptance Criteria sheet for Group B test is also attached.

9. Similar reference curves will be used for comprehensive pump tests using the applicable acceptance criteria and instrument accuracy and range requirements.

10. Only a small portion of the established reference curve is being used to accommodate flow rate variance. See the attached sample pump Acceptance Criteria sheets.

11. A single reference value shall be assigned for each vibration measurement location. The selected reference value shall be at the minimum data over the narrow range of pump curves being used as required by Code Case OMN-16.

Relief Request – **RP03** (Contd.)

12. When the repair, replacement, or routine servicing of a pump may have affected a reference curve, a new reference curve shall be determined, or the existing reference curve reconfirmed, in accordance with para. 16-3310 of Code Case OMN-16.

13. If it is necessary or desirable, for some reason other than that stated in para. 16-3310 of Code Case OMN-16, to extend the current pump curve or establish an additional reference curve, the new curve(s) must be determined in accordance with para. 16-3320 of Code Case OMN-16.

Quality/Safety Impact

Due to impracticality of adjusting independent variables (flow rate, and speed for variable drive RCIC pump) to a fixed reference value for inservice testing without system modifications, alternate testing to vary the variables over a very narrow range (up to ± 2% of reference values) and using pump reference curves for this narrow range is proposed. Alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and will adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

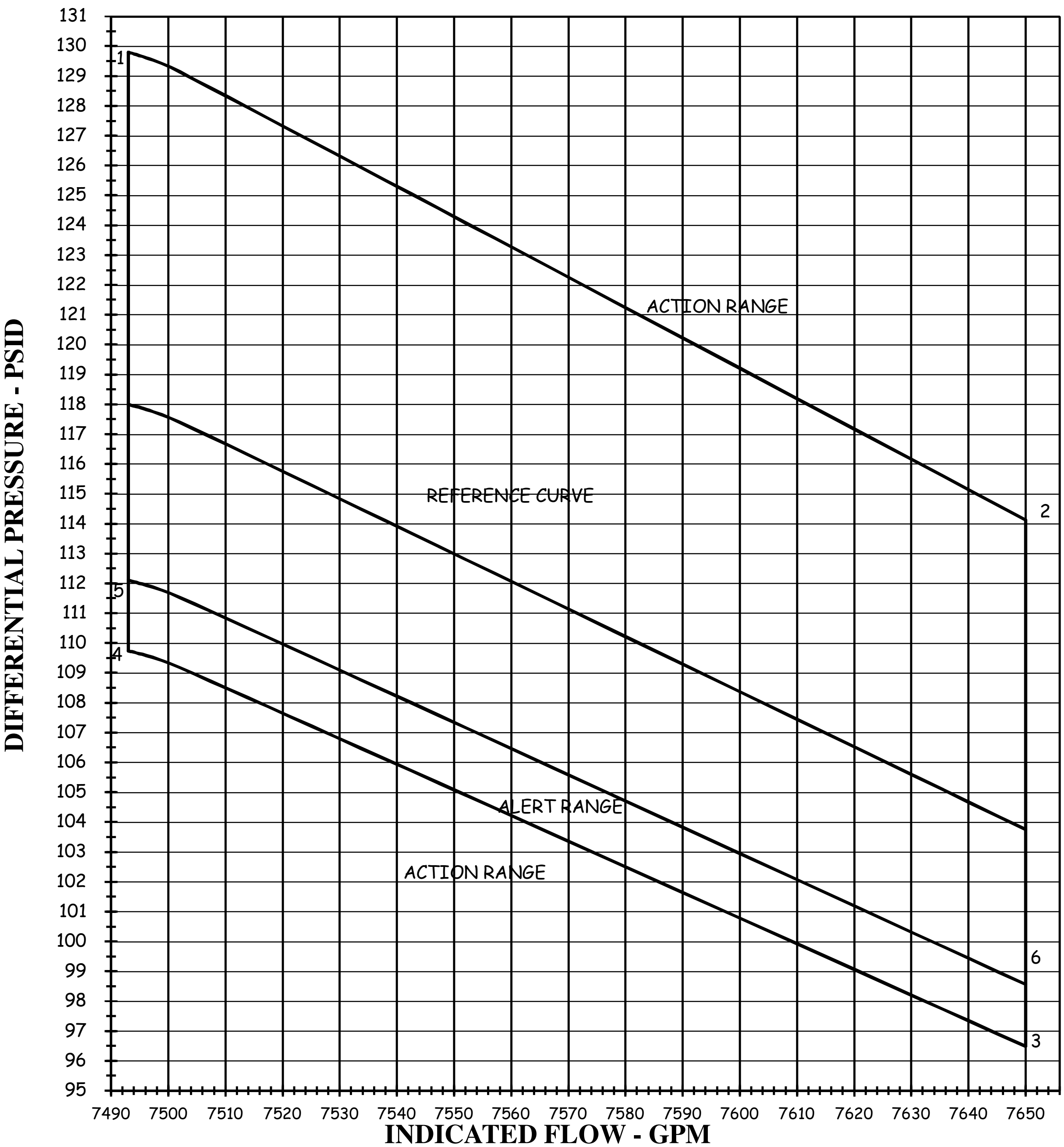
Similar relief was granted for the third 10 year interval. NRC approval was documented in a letter dated March 23, 2007 (ADAMS Accession Number ML 070600111, TAC No. MD3537) for Relief Request No. RP04.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP03** (Contd.)

SAMPLE DATA SHEET - Group A Test
RHR-P-2A ACCEPTANCE CRITERIA

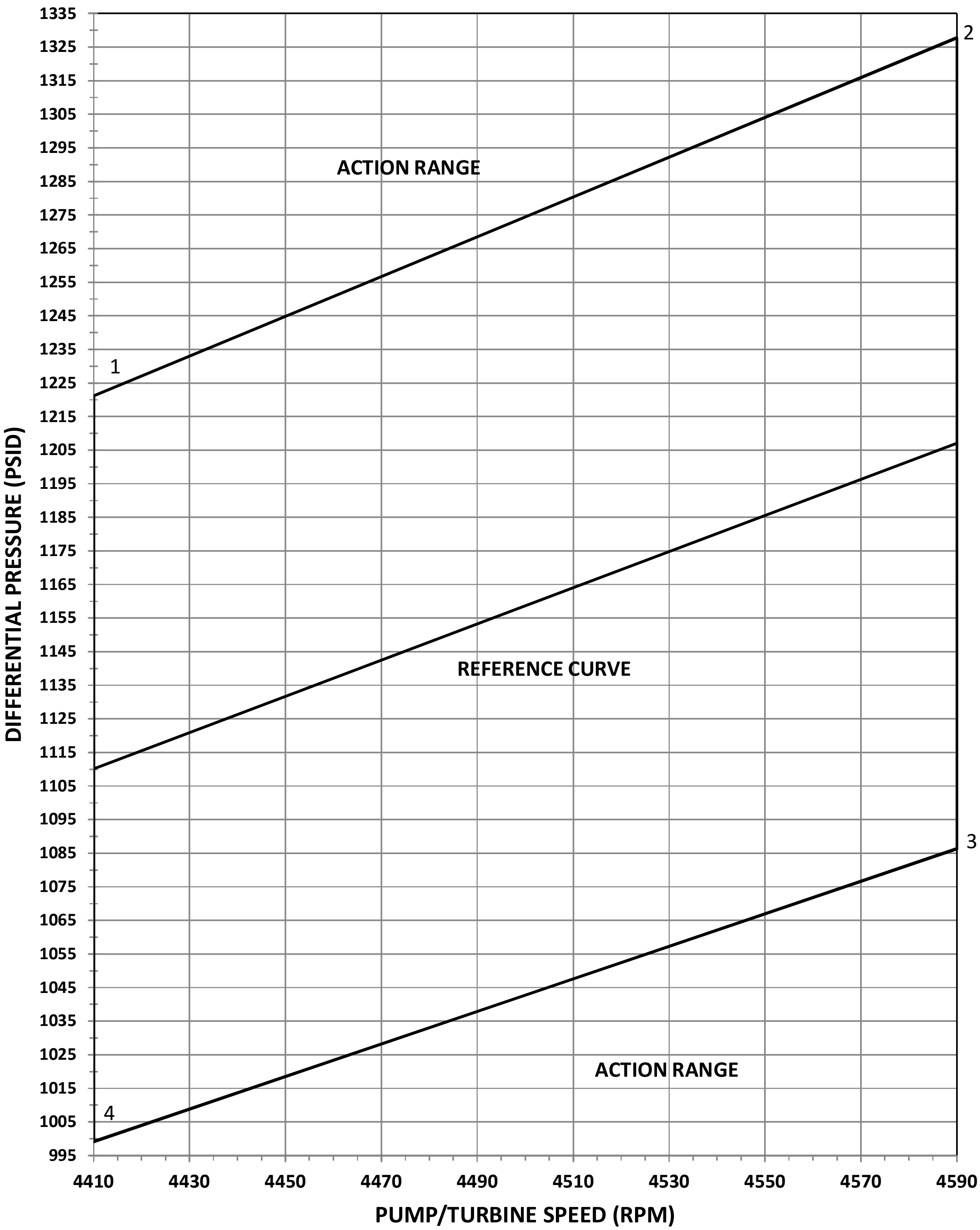


ALERT RANGE = Area Inside 3-4-5-6

ACTION RANGE = Area Outside 1-2-3-4

Relief Request – **RP03** (Contd.)

SAMPLE DATA SHEET - Group B Test
RCIC-P-1 ACCEPTANCE CRITERIA



ACTION RANGE = Area Outside 1-2-3-4

Relief Request – **RP04**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

ASME Code Components Affected

Pump	Code Class	Pump Group	P&ID Dwg. Number	System(s)
RHR-P-2A	2	A	M521, SH 1	Residual Heat Removal
RHR-P-2B	2	A	M521, SH 2	
RHR-P-2C	2	A	M521, SH 3	
HPCS-P-1	2	B	M520	High Pressure Core Spray

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

ISTB-3510(b)(1). Range. The full- scale range of each analog instrument shall be not greater than three times the reference value.

Reason for Request

Installed test gauges used to measure the pump discharge pressure, which is used to determine differential pressure, do not meet the Code range requirements. Residual Heat Removal (RHR) and High Pressure Core Spray (HPCS) Pumps discharge pressure instruments (RHR-PT-37A, RHR-PT-37B, RHR-PT-37C, and HPCS-PT-4), exceed or may exceed (dependent upon measured parameters), the Code allowable range limit of three times the reference value. Relief is required for Group A, and Group B inservice test only. Temporary test gauges meeting the Code requirements shall be used for comprehensive and preservice test.

Proposed Alternative and Basis for Use

During Group A or Group B pump inservice testing, pump discharge pressure which is used to determine differential pressure shall be measured by respective Transient Data Acquisition Data (TDAS) points listed below for each pump. TDAS data averages 100 readings with a reading taken each second.

1. ISTB-3510(a) and ISTB-3510(b)(1) specify both accuracy and range requirements for each instrument used in measuring pump performance parameters. The purpose of instrument requirements is to ensure that pump test measurements are sufficiently accurate and repeatable to permit evaluation of pump condition and detection of degradation. Instrument accuracy limits the inaccuracy associated with the measured test data. Thus, higher instrument accuracy lowers the uncertainty associated with the measured data. The purpose of the Code range requirement is to ensure reading accuracy and repeatability of test data.

Relief Request – **RP04** (Contd.)

2. Since the TDAS data is being obtained to an accuracy of ± 1% of full scale, it consistently yields measurements more accurate than would be provided by instruments meeting the Code instrument accuracy requirement of ± 2% of full scale and range requirement of three times the reference value. Equivalent Code accuracy being obtained by TDAS measurements is calculated in the table below.

Pump	Test Parameter	Instrument I.D.	Range (PSIG)	*Ref. Value (PSIG)	Instrument Loop Accuracy	Equivalent Code Accuracy
RHR-P-2A	Discharge Pressure	RHR-PT-37A TDAS PT 155	0-600	136	± 1%, ± 6 psig	[6/(3x136)]x100 =1.47%
RHR-P-2B	Discharge Pressure	RHR-PT-37B TDAS PT 076	0-600	148	± 1%, ± 6 psig	[6/(3x148)]x100 =1.35%
RHR-P-2C	Discharge Pressure	RHR-PT-37C TDAS PT 091	0-600	143	± 1%, ± 6 psig	[6/(3x143)]x100 =1.40%
HPCS-P-1	Discharge Pressure	HPCS-PT-4 TDAS PT 107	0-1500	465	± 1%, ± 15 psig	[15/(3x465)]x100 =1.08%

* The above table reflects latest reference values as specified in the implementing procedures. This table will not be updated to reflect small changes in future reference values.

Thus, the range and accuracy of TDAS instruments being used to measure pump discharge pressure result in data measurements of higher accuracy than that required by the Code and thus will provide reasonable assurance of pump operational readiness. It should also be noted that the TDAS system averages many readings, therefore giving a significantly more accurate reading than would be obtained by using the averaging technique as allowed by ISTB-3510(d) on visual observation of a fluctuating test gauge.

3. The range of the pressure transmitters (PTs) used for these applications were selected to bound the expected pump discharge pressure range during all normal and emergency operating conditions (the maximum expected discharge pressure for the RHR and HPCS pumps is approximately 450 psig and 1400 psig respectively). However, during inservice testing the pumps are tested at full flow, resulting in lower discharge pressures than the elevated discharge pressure that can occur during some operating conditions. For this reason the pump reference value is significantly below the maximum expected operational discharge pressure. A reduction of the range of the PTs to three times the reference value would, in these cases, no longer bound the expected discharge pressure range for these pumps, and therefore is not practicable. If a PT were to fail, a like replacement would have to be used due to the above identified reasons of replacing a PT with one not suited for all pump flow conditions. However, this is not a concern because the existing instrumentation provides pump discharge pressure indication of higher accuracy and better resolution than that required by the Code for evaluating pump condition and detecting degradation.

4. NUREG-1482, Revision 2 Section 5.5.1 states that when the range of a permanently installed analog instrument is greater than three times the reference value, but the accuracy of the instrument is more conservative than that required by the Code, the [NRC] staff may grant relief when the combination of the range and accuracy yields a reading that is at least equivalent to that achieved using instruments that meet the Code requirements (i.e. up to ±6 percent for Group A and B tests, and ±1.5 percent for pressure and differential pressure instruments for Preservice and Comprehensive tests).

Relief Request – **RP04** (Contd.)

Quality/Safety Impact

TDAS data will consistently provide acceptable accuracy to ensure that the pumps are performing at the flow and pressure conditions to fulfill their design function. TDAS data is sufficiently accurate for evaluating pump condition and in detecting pump degradation. The effect of granting this relief request will have no adverse impact on plant and public safety. Test quality will be enhanced by obtaining slightly better, more repeatable data.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

This relief was granted for the third 10 year interval. NRC approval was documented in a letter dated March 23. 2007 (ADAMS Accession Number ML 070600111, TAC No. MD3538) for Relief Request No. RP05.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP05**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(ii)

– Hardship or Unusual Difficulty
Without Compensating Increase in Level of Quality or Safety –

ASME Code Components Affected

Pump	Code Class	Pump Group	P&ID Dwg. No.	System(s)
SLC-P-1A	2	B	M522	Standby Liquid Control
SLC-P-1B	2	B	M522	

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code

Applicable Code Requirement

Subsection ISTB-3550. When measuring flow rate, a rate or quantity meter shall be installed in the pump test circuit. If a meter does not indicate the flow rate directly, the record shall include the method used to reduce the data.

Subsection ISTB-5300(a). (1) For the Group A test and the comprehensive test, after pump conditions are as stable as the system permits, each pump shall be run at least 2 min. At the end of this time at least one measurement or determination of each of the quantities required by Table ISTB-3000-1 shall be made and recorded. (2) For the Group B test, after the pump conditions are stable, at least one measurement or determination of the quantity required by Table ISTB-3000-1 shall be made and recorded.

Relief is required for Group B and comprehensive and preservice tests.

Reason for Request

A rate or quantity meter is not installed in the test circuit. To have one installed would be costly and time consuming with few compensating benefits.

As a result of a rate or quantity meter not being installed in the test circuit, it is impractical to directly measure the flow rate for the Standby Liquid Control pumps. Therefore, the requirement for allowing a 2 minute “hold” time for Pump tests is an unnecessary burden which would provide no additional assurance of determining pump operational readiness.

Relief Request – **RP05** (Contd.)

Proposed Alternative and Basis for Use

NUREG-1482, Revision 2 Section 5.5.2 states, "requiring licensees to install a flow meter to measure the flow rate and to guarantee the test tank size, such that the pump flow rate will stabilize in 2 minutes before recording the data would be a burden because of the design and installation changes to be made to the existing system. Therefore, compliance with the Code requirements would be a hardship".

Pump flow rate will be determined by measuring the volume of fluid pumped and dividing corresponding pump run time. The volume of fluid pumped will be determined by the difference in fluid level in the test tank at the beginning and end of the pump run (test tank fluid level corresponds to volume of fluid in the tank). The pump flow rate calculation methodology meets the accuracy requirements of OM Code, Table ISTB-3510-1. The pump flow rate calculation is identified on the record of test and ensures that the method for the flow rate calculation yields an acceptable means for the detection and monitoring of potential degradation of the Standby Liquid Control Pumps and therefore, satisfies the intent of the OM Code Subsection ISTB.

In this type of testing, the requirement to maintain a 2 minute hold time after stabilization of the system is unnecessary and provides no additional increase of the ability of determining pump condition.

Quality/Safety Impact

The test tank fluid volume is approximately 236 gallons. The measured flow rate is approximately 43 gpm. The accuracy of the level reading is ± 1/8 inch. The accuracy of volume or level change is ± 1/4 inch (1/8 inch at initial level and 1/8 inch at final level). The pump is required to be run for a minimum time to ensure that an 18 inch change of test tank level has occurred. This is to ensure that the Code required accuracy for flow rate measurement of ±2% is satisfied. A 2% error over 18 inches corresponds to 0.36 inches that is greater than 0.25 inches. The test methodology used to calculate pump flow rate will provide results consistent with Code requirements. This will provide adequate assurance of acceptable pump performance.

Calculation methods are specified in the surveillance procedures for the Standby Liquid Control Pumps, and meet the quality assurance requirements for the Columbia Generating Station.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

Similar relief was granted for the third 10 year interval. NRC approval was documented in a letter dated May 15, 2007 (ADAMS Accession Number ML 071010344, TAC No. MD3548) for Relief Request No. RP06.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RP06**

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

– Alternative Provides Acceptable Level of Quality and Safety –

ASME Code Components Affected

Pump	Code Class	Pump Group	Design Basis Accident Flow rate (GPM)	Test Flow Rate (GPM)
FPC-P-1A	3	A	*575	595 to 605
FPC-P-1B	3	A	*575	595 t0 605
HPCS-P-1	2	B	6250 @ 0 psid	6500 to 6690
HPCS-P-2	3	A	*1022	1030 to 1180
LPCS-P-1	2	B	5625 @ 0 psid	6435 to 6630
RCIC-P-1	2	B	600	610 to 628
RHR-P-2A	2	A	7034 @ 0 psid	7493 to 7650
RHR-P-2B	2	A	7034 @ 0 psid	7493 to 7650
RHR-P-2C	2	A	7034 @ 0 psid	7493 to 7650
SLC-P-1A	2	B	41.2	GT 41.49
SLC-P-1B	2	B	41.2	GT 41.49
SW-P-1A	3	A	*8928	9350 to 10270
SW-P-1B	3	A	*8880	9350 to 10270

* These values are design flow rates rather than design basis accident flow rates.

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code.

Applicable Code Requirement

ISTB-5123(e), Comprehensive Test Procedure refers to Table ISTB-5121-1 "Centrifugal Pump Test Acceptance Criteria" that requires "Required Action Range" High limit of 3% above the established reference value for the measured hydraulic value of differential pressure or flow rate for the Comprehensive Test.

ISTB-5223(e), Comprehensive Test Procedure refers to Table ISTB-5221-1 Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria that requires "Required Action Range" High limit of 3% above the established reference value for the measured hydraulic value of differential pressure or flow rate for the Comprehensive Test.

ISTB-5323(e), Comprehensive Test Procedure refers to Table ISTB-5321-2 Reciprocating Positive Displacement Pump Test Acceptance Criteria that requires "Required Action Range" High limit of 3% above the established reference value for the measured hydraulic value of discharge pressure or flow rate for the Comprehensive Test.

Relief Request – **RP06** (Contd.)

Reason for Request

For some comprehensive pump tests, Energy Northwest had difficulty in implementing the high required action range limit of 1.03% above the established hydraulic parameter reference value due to normal data scatter. Energy Northwest had to develop contingency plans in the pump operability surveillance procedures in the event the pump enters the action high range and is declared inoperable and applicable Technical Specification LCO entered for reasons other than a pump degradation issue.

Based on the similar difficulties experienced by other Owners, ASME OM Code Case OMN-19 was developed and has been published in the ASME OM-2012 edition. The white paper for this code case Standards Committee Ballot 09-610, record 09-657, discussed the impact of instrument inaccuracies, human factors involved with setting and measuring test parameters, readability of gauges and other miscellaneous factors on the ability to meet the 1.03% acceptance criteria. Industry operating experience is also discussed in the white paper.

Code Case OMN-19 has not been approved for use in RG 1.192, “Operations and Maintenance Code Case Acceptability, ASME OM Code.”

Proposed Alternative and Basis for Use

Columbia Generating Station proposes to use the ASME OM Code Case OMN-19 as published in ASME OM-2012 edition for the fourth ten year interval of IST Program. The 2012 edition of Operation and Maintenance of Nuclear Power Plants, was approved by the ASME Board on Nuclear Codes and Standards on December 21, 2012. ASME OMN-19 code case allows the use of a multiplier of 1.06 times the reference value in lieu of the 1.03 multiplier for the comprehensive pump test’s upper “Acceptable Range” criteria and “Required Action Range, High” criteria referenced in the applicable ISTB test acceptance criteria tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2.

As stated in the Standards Committee Ballot white paper this issue was also discussed at the ASME/NRC special meeting on June 4th, 2007. The NRC questioned the basis for the upper required action limits. The inaccuracies that are the basis for the change as discussed in the white paper are summarized below.

1. Instrument inaccuracies of measured hydraulic value.
2. Instrument inaccuracies of set value and its effect on measured value.
3. Instrument inaccuracies and allowed tolerance for speed.
4. Human factors involved with setting and measuring flow, D/P, and speed.
5. Readability of Gauges based on the smallest gauge increment.
6. Miscellaneous Factors.

The above discussed inaccuracies associated with obtaining the comprehensive pump test hydraulic data may easily cause the measured value to exceed the existing code allowed upper required action limit of 3%. The new upper limit of 6% as approved in the code case OMN-19 will eliminate declaring the pump inoperable and entering unplanned Technical Specification LCO.

Relief Request – **RP06** (Contd.)

The mandatory Appendix V pump periodic verification test program has been published in ASME OM-2012 edition. This mandatory appendix contains requirements to augment the rules of subsection ISTB for inservice testing of pumps. It also states that the Owner is not required to perform a pump periodic verification test if the design basis accident flow rate in the Owner's safety analysis is bounded by the comprehensive pump test or Group A test. As specified in the pump table above the quarterly Group A or B and biennial comprehensive tests bound the verification of pump design basis flow rate and associated differential pressure or discharge pressure for positive displacement pumps.

Quality/Safety Impact

Using the upper limit of 1.06 times the reference value in lieu of the 1.03 multiplier for the comprehensive pump test's upper "Acceptable Range" criteria and "Required Action Range, High" criteria referenced in the applicable ISTB test acceptance criteria tables will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety. Each pump performance is also monitored by subsection ISTB required quarterly applicable Group A or Group B test that verifies operational readiness of the pump. The quarterly Group A or B pump test and biennial comprehensive pump tests bounds the verification of pump design basis flow rate and associated differential or discharge pressure as applicable.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

None

References

1. Code Case OMN-19, Alternative Upper Limit for the Comprehensive Pump Test. Published In ASME OM-2012 Edition.

2. Division 1, Mandatory Appendix V Pump Periodic Verification Test Program. Published In ASME OM-2012 Edition.

3. White Paper for ISTB Code Change, December / 2007, [Standards Committee Ballot 09-610, Record 09-657] Change C, A relaxation of the required high action range for the Comprehensive Pump Test Hydraulic parameters (1.03 to 1.06).

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

5.0 VALVE INSERVICE TESTING PROGRAM

5.1 Introduction

ASME OM Code requires periodic testing of certain safety related valves in order to verify their operational readiness and leak tight integrity. The Columbia Generating Station Valve Inservice Testing Program satisfies these requirements and conforms to FSAR commitments and Technical Specifications for ASME valve testing. The program establishes the requirements for preservice and inservice testing to assess the operational readiness of safety related valves. The Program is based on the requirements of the ASME OM Code-2004 edition and 2005 and 2006 addenda Subsection ISTC, “Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants”. The program complies with the specifications of the approved Codes and Regulations. This program includes those ASME valves which are required in shutting down the reactor to the cold shutdown condition, maintaining the cold shutdown condition, or mitigating the consequences of an accident.

The Program Plan establishes tests and test intervals, acceptance criteria, corrective actions, and records requirements. Where conformance with certain Code requirements is impractical, relief requests are included in Section 5.9 with supporting information and proposed alternatives.

5.2 Program Implementation

5.2.1 Exemptions (ISTC-1200)

The following are excluded from this Subsection, provided that the valves are not required to perform a specific function as described in ISTA-1100:

a. valves used only for operating convenience such as vent, drain, instrument, and test valves.
b. valves used only for system control, such as pressure regulating valves; and
c. valves used only for system or component maintenance.

Skid-mounted valves are excluded from this Subsection, provided they are tested as part of the major component and are justified by the Owner to be adequately tested.

External control and protection systems responsible for sensing plant conditions and providing signals for valve operation are excluded from the requirements of this Subsection.

Category A and Category B safety and relief valves are excluded from the requirements of ISTC-3700, Valve Position Verification and ISTC-3500, Valve Testing Requirements.

Nonreclosing pressure relief devices (rupture disks) used in BWR Scram Accumulators are excluded from the requirements of this Subsection.

5.2.2 Valve Categories (ISTC-1300)

Valves within the scope of this Subsection shall be placed in one or more of the following categories. When more than one distinguishing category characteristic is applicable, all requirements of each of the individual categories are applicable, although duplication or repetition of common testing requirements is not necessary.

a. Category A: valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function(s), as specified in ISTA-1100.
b. Category B: valves for which seat leakage in the closed position is inconsequential for fulfillment of the required function(s), as specified in ISTA-1100.
c. Category C: valves that are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of the required function(s), as specified in ISTA-1100.
d. Category D: valves that are actuated by an energy source capable of only one operation, such as rupture disks or explosively actuated valves.

5.2.3 Owner’s Responsibility (ISTC-1400)

It is the Owner's responsibility to

a. Include in the plant design all necessary instrumentation, test connections, flow instruments, or any other provisions that are required to fully comply with the requirements of this Subsection.
b. Categorize (see ISTC-1300), and list in the plant records (see ISTC-9000) each valve to be tested in accordance with the rules of this Subsection, including Owner-specified acceptance criteria. The Owner shall specify test condition.
c. Ensure that the application, method and capability of each nonintrusive technique is qualified.

5.2.4 Preservice Testing (ISTC-3100)

Each valve shall be tested during the preservice test period. These tests shall be conducted under conditions as near as practicable to those expected during subsequent inservice testing. Only one preservice test of each valve is required with these exceptions.

a. Any valve that has undergone maintenance that could affect its performance after the preservice test shall be tested in accordance with ISTC-3310.
b. Safety and relief valves and nonreclosing pressure relief devices shall meet the preservice requirements of Mandatory Appendix I.

5.2.5 Inservice Testing (ISTC-3200)

Inservice testing shall commence when the valves are required to be operable to fulfill their required function(s). Surveillance testing is performed for each valve listed in the program, nominally every 3 months. For valves in systems out of service (declared inoperable or not required to be operable), the test is performed prior to placing the system in an operable status and the test schedule resumed. The Columbia

Generating Station Valve Inservice Testing Program is implemented as part of the technical surveillance testing program.

5.2.6 Reference Values (ISTC-3300)

Reference values shall be determined from the results of preservice testing or from the results of inservice testing. These tests shall be performed under conditions as near as practicable to those expected during subsequent inservice testing. Reference values are established only when the valve is known to be operating acceptably. Baseline data for stroke times has been obtained from initial Valve Operability Tests. The limiting value(s) of full-stroke time of each power-operated valve is listed in the test procedures. Some times the reference values are more accurately determined by an average of stroke times.

5.2.7 Valve Testing Requirements (ISTC-3500)

Active and passive valves in the categories defined in ISTC-1300 shall be tested in accordance with the paragraphs specified in Table ISTC-3500-1 and the applicable requirements of ISTC-5100 and ISTC-5200.

TABLE ISTC-3500-1 INSERVICE TEST REQUIREMENTS

Category (See ISTC-1300	Valve Function	Leakage Test Procedure & Frequency	Exercise Test Procedure & Frequency	Special Test Procedure [Note (1)]	Position Indication Verification & Frequency
A	Active	See ISTC-3600	See ISTC-3510	None	See ISTC-3700
A	Passive	See ISTC-3600	None	None	See ISTC-3700
B	Active	None	See ISTC-3510	None	See ISTC-3700
B	Passive	None	None	None	See ISTC-3700
C (Safety and relief) [Note(3)]	Active	None [Notes(2),(3)]	See ISTC-5230, ISTC-5240	None	See ISTC-3700
C (Check) [Note (4)]	Active	None [Note (3)]	See ISTC-3510	None	See ISTC-3700
D	Active	None [Note (3)]	None	See ISTC-5250,ISTC-5260	None

<u>NOTES</u>:
(1) Note additional requirements for fail-safe valves, ISTC-3560.
(2) Leak test as required for Mandatory Appendix I.
(3) When more than one distinguishing category characteristic is applicable, all requirements of each of the individual categories are applicable, although duplication or repetition of common testing requirements is not necessary.
(4) If a check valve used for a pressure relief device is capacity certified, then it shall be classified as a pressure or vacuum relief device. If a check valve used to limit pressure is not capacity certified, then it shall be classified as a check valve.

5.2.8 Exercising Test Frequency (ISTC-3510)

Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222.

5.2.9 Valve Obturator Movement (ISTC-3530)

The necessary valve obturator movement shall be determined by exercising the valve while observing an appropriate indicator, such as indicating lights that signal the required changes of obturator position, or by observing other evidence, such as changes in system pressure, flow rate, level, or temperature, that reflects change of obturator position.

5.2.10 Manual Valves (ISTC-3540)

Manual valves shall be full-stroke exercised at least once every 2 years, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness. Any increased testing frequency shall be specified by the Owner. The valve shall exhibit the required change of obturator position.

5.2.11 Fail Safe Valves (ISTC-3560)

Valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency of ISTC-3510. Fail-safe testing is required only for those valves for which a fail-safe feature is a required safety function of the valve. Fail safe valves, as identified by the valve test tables, are tested by observing the operation of the actuator upon loss of valve electrical, pneumatic or hydraulic actuating power. In most cases, loss of electrical power causes loss of actuating fluid, and can be accomplished using normal control circuits. MSIVs are fail-safe tested with the non-safety related instrument air supply isolated.

5.2.12 Valves in Systems Out of Service (ISTC-3570)

For a valve in a system declared inoperable or not required to be operable, the exercising test schedule need not be followed. Within 3 months before placing the system in an operable status, the valves shall be exercised and the schedule followed in accordance with requirements of this Subsection.

5.2.13 Valve Seat Leakage Rate Test (ISTC-3600)

The category A valves identified in this program are seat leakage tested in accordance with the requirements of ISTC-3600.

5.2.14 Position Verification Testing (ISTC-3700)

Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation.

5.2.15 Instrumentation (ISTC-3800)

Instrumentation accuracy shall be considered when establishing valve test acceptance criteria.

5.2.16 Specific Testing Requirements (ISTC-5000)

Following subsections provide specific valve testing requirements, acceptance criteria and corrective action for various types of valves in addition to valve testing requirements specified in subsection ISTC-3500.

a. Motor-Operated Valves (ISTC-5120)

   In addition to testing motor-operated valves in accordance with the requirements of ISTC-3500, 10 CFR 50.55a(b)(3)(ii) requires licensees to establish a program to ensure that motor-operated valves continue to be capable of performing their design basis safety functions. This is accomplished through implementation of the GL-96-05 MOV Periodic Verification Program.

b. Pneumatically Operated Valves (ISTC-5130)

c. Hydraulically Operated Valves (ISTC-5140)

d. Solenoid Operated Valves (ISTC-5150)

e. Manually Operated Valves (ISTC-5210)

f. Check Valves (ISTC-5220)

   For check valves the necessary valve obturator movement during exercise testing shall be demonstrated by performing both an open and a close test.

5.2.17 Check Valve Condition Monitoring Program (ISTC-5222)

As an alternative to the testing or examination requirements of ISTC-3510, ISTC-3520, ISTC-3530, ISTC-3550, and ISTC-5221, the Owner may establish a condition-monitoring program. The purpose of this program is both to improve check valve performance and to optimize testing, examination, and preventive maintenance activities in order to maintain the continued acceptable performance of a select group of check valves. Columbia may implement this program on a valve or a group of similar valves. The program shall be implemented in accordance with Mandatory Appendix II, Check Valve Condition Monitoring Program, of ASME OM Code-2004 edition and 2005 and 2006 addenda.

If the Appendix II condition monitoring program for a valve or valve group is discontinued, then the testing or examination requirements of ISTC-3510, ISTC-3520, ISTC-3530, ISTC-3550, and ISTC-5221 shall be implemented for the applicable check valves.

Examples of candidates for improved valve performance are check valves that

- have an unusually high failure rate during inservice testing or operations
- cannot be exercised under normal operating conditions or during shutdown
- exhibit unusual, abnormal, or unexpected behavior during exercising or operation, or
- the Owner elects to monitor for improved valve performance.

Examples of candidates for optimization of testing, examination, and preventive maintenance activities are check valves with documented acceptable performance that

- have had their performance improved under the Condition Monitoring Program
- cannot be exercised or are not readily exercised during normal operating conditions or during shutdown
- can only be disassembled and examined, or
- the Owner elects to optimize all the associated activities of the valve or valve group in a consolidated program.

5.2.18 Vacuum Breaker Valves (ISTC-5230)

Vacuum breakers shall meet the applicable inservice test requirements of ISTC-5220 and Mandatory Appendix I.

5.2.19 Safety and Relief Valve Tests (ISTC-5240)

Safety and relief valves shall meet the inservice test requirements of Mandatory Appendix I.

5.2.20 Rupture Disks (ISTC-5250)

Rupture disks shall meet the requirements for noreclosing pressure relief devices of Mandatory Appendix I.

5.2.21 Explosively Actuated Valves

Explosively actuated valves shall be tested in accordance with the requirements of ISTC-5260.

5.2.22 Test Procedure

Valves in the Valve Testing Program are tested according to detailed procedures. The procedures include, as a minimum:

a. Statement of Test Purpose. This section identifies test objectives, references applicable Technical Specifications and notes the operating modes for which the test is appropriate.

b. Prerequisites for Testing. System valve alignment and additional instrumentation (e.g., stop watch) is noted. Identification numbers, range and calibration verification of additional instrumentation is recorded.

c. Test Instructions. Directions are sufficiently detailed to assure completeness and uniformity of testing. Instructions include provisions for returning the system to its normal standby configuration following testing.

d. Acceptance Criteria. The ranges within which test data is considered acceptable are established per Code requirements for applicable valve type and included in the test procedure. In the event that the test data falls outside the acceptable ranges, corrective actions are taken in accordance with Code requirements.

e. Reference Values.

5.2.23 Trending

Stroke times of power-operated valves are trended.

Finally, it is recognized that the Valve Inservice Testing Program sets forth minimum testing requirements. Additional testing will be performed, as required, after valve maintenance, or as determined necessary by the Plant staff.

5.3 Valve Test Tables

The Valve Test Tables provide a concise description of the station's Valve Program for compliance with valve IST requirements. The tables include active valves which are required to operate in order to safely shutdown the reactor to the cold shutdown condition, maintain it in the cold shutdown condition, or mitigate the consequences of an accident. Additionally, passive valves which require leak rate testing or valve position verification are also included. The tables reflect the positions taken in support of the relief requests.

To aid in the interpretation of the tables, brief explanations of the table headings and abbreviations are provided.

(1) VALVE - Each valve in the Plant has a unique "tag" number. This is divided into three parts. The first identifies the system to which the valve belongs (i.e., RHR, HPCS ...), the second Part identifies type of valve (flow control valve = FCV, relief valve = RV, rupture disc = RD, etc.), and the third Part is serialized to insure each valve number is unique. A brief functional description of the valve is also provided.

CMP - Check Valves which are included in the Check Valve Condition Monitoring Program are designated as CMP. These valves will be tested and examined as required by the specified Condition Monitoring Plan.

(2) DWG & COORD - The flow diagram drawing is identified along with the coordinates indicating where on the drawing the valve is located.

(3a) CLASS - ASME Code Class per Section III of the ASME Boiler and Pressure Vessel Code.

1, 2 or 3	=	ASME Class 1, 2 or 3
D	=	Non-ASME

(3b) CAT - Valve categories A, B, C, and D are defined in accordance with subsection ISTC-1300 requirements. Each valve has specific testing requirements which are determined by the category to which it belongs.

(4a) ACTUATOR Type - The following abbreviations are used to describe actuator types. Valves may be actuated in more than one way.

AO	=	Air operated
HO	=	Hydraulic operated
MA	=	Manually operated
MO	=	Motor operated
SA	=	Self-actuated
SO	=	Solenoid operated

(4b) VALVE Type - The following abbreviations are used to describe valve type:

BA	=	Ball Valve	RD	=	Rupture Disc
BF	=	Butterfly Valve	RV	=	Relief Valve
CK	=	Check Valve	SC	=	Stopcheck Valve
DI	=	Diaphragm Valve	SR	=	Safety/Relief Valve
EX	=	Explosive Valve	SV	=	Solenoid Valve
GB	=	Globe Valve			
GT	=	Gate Valve			

(4c) SIZE - Nominal pipe diameter to which the valve connects is given in inches.

(5a) SAFETY Position - Safety position identifies the position(s) the valve must assume to fulfill its safety function(s).

C	=	Closed
NA	=	Not Applicable (i.e., overpressure protection devices, valves included at the Owner's discretion, or valves with no required safety position)
O	=	Open
O/C	=	Both Open and Closed

(5b) FAILED Position - Failed position identifies the position the valve assumes upon loss of actuating power.

FAI	=	Fail As Is
FC	=	Failed Close
FO	=	Failed Open
NA	=	Not Applicable

(5c) NORMAL Position - Normal position identifies the valve position during normal power operation.

LC	=	Locked Close
LO	=	Locked Open
NC	=	Normally Closed
NO	=	Normally Open
NT	=	Normally Throttled

(6a) TESTS - This column lists a code corresponding to the test requirements applicable to that valve.

Di Disassembly and Inspection

G ISTC-3700 -- Verify the accuracy of remote position indicators.

H ISTC-3520 -- Full stroke exercise the valve to its required position to fulfill its function.

Hx Stroke exercise to satisfy bidirectional functionality in accordance with Condition Monitoring Plan.

J ISTC-5121, ISTC-5131, ISTC-5141 and ISTC-5151-- Measure the stroke time of power operated valves.

K ISTC-3560 -- Testing valves with fail-safe actuators (fail-safe testing is required only for those valves for which the fail-safe feature is a required safety function of the valve).

L ISTC-3600 -- Valve seat leakage rate test.

Nit Non-intrusive Testing

P ISTC-5240 -- Safety and relief valve test per OM Code Mandatory Appendix I requirements.

S OM Code Mandatory Appendix I -- Vacuum Relief Setpoint Test

V ISTC-5260 -- Explosively actuated valve test.

W ISTC-5250 -- Rupture discs shall meet the requirements for nonreclosing pressure relief devices of OM Code Mandatory Appendix I.

(6b) FREQUENCY - This column identifies the required testing frequency.

Legend	Meaning
CMP	Test performed in accordance with Condition Monitoring Plan.
CS	Test performed during cold shutdowns but not more frequently than once every 92 days. Valve testing shall commence within 48 hours after cold shutdown is achieved and continue until complete or until the Plant is ready to return to power.
EX	Test explosive valve per ISTC-5260 schedule.
FS	Test performed per FSAR Commitment
J	Leakage Test per Primary Containment Leakage Rate Testing Program (10 CFR 50 Appendix J, Option B)
N	Not Applicable.
Q	Test performed once every 92 days.
RD	Test rupture disc per OM Code Mandatory Appendix I schedule.
RF	Test performed each refueling outage.
RV	Test relief valve per OM Code Mandatory Appendix I schedule.
TS	Test performed per Technical Specification or Licensee Controlled Specification.
2Y,4Y,6Y,etc	Test performed once during specified number of years e.g. 2, 4, 6 etc.
12M	Test performed annually

(6c) PPM - This identifies the implementing procedure. This field is for information only and may be changed without formal amendment to the valve tables.

(7) TESTING EXCEPTIONS - This field is used to identify any applicable Relief Requests (RVs), Refueling Outage Justifications (ROJs) or Cold Shutdown Justifications (CSJs).

(8) REMARK - This field is used to provide reference to explanatory notes or Technical Positions located at the end of the Valve Test Tables. Passive valves are annotated as passive, all other valves are active. Minor changes to the program via change notices may also be identified in this field.

Valve Test Tables

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CAS-V-29A THRU D	M510-2 J8	3 AC	SA CK 0.50	C NA NC	HL RF OSP-MSIV/IST-R701	ROJ02	
DESCRIPTION: CAS TO MS-V-28A,B,C,D (MSIV) OPERATOR CHK							
CAS-V-730	M510-2 H12	2 A	MA GB 1	C NA LC	L J TSP-CAS/X82e-C801		Passive
DESCRIPTION: AIR LINE ISO FOR TESTING WW-DW VACUUM BRKRS (CIV)							
CAS-VX-82E	M510-2 H12	2 A	MA GB 1	C NA LC	L J TSP-CAS/X82e-C801		Passive
DESCRIPTION: AIR LINE ISO FOR TESTING WW-DW VACUUM BRKRS (CIV)							
CEP-V-1A	M543-3 H8	2 A	AO BF 30	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X3-R801		TV01
DESCRIPTION: DRYWELL EXHAUST (CIV)							
CEP-V-1B	M543-3 H8	2 A	AO GB 2	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X3-R801		TV01
DESCRIPTION: CEP-V-1A BYPASS (CIV)							
CEP-V-2A	M543-3 H7	2 A	AO BF 30	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X3-R801		TV01
DESCRIPTION: DRYWELL EXHAUST (CIV)							
CEP-V-2B	M543-3 H7	2 A	AO GB 2	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X3-R801		TV01
DESCRIPTION: CEP-V-2A BYPASS (CIV)							
CEP-V-3A	M543-3 G9	2 A	AO BF 24	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X67-R802		TV01
DESCRIPTION: SUPPRESSION CHAMBER EXHAUST (CIV)							
CEP-V-3B	M543-3 G9	2 A	AO GB 2	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP- CEP/X67-R802		TV01
DESCRIPTION: CEP-V-3A BYPASS (CIV)							
CEP-V-4A	M543-3 E9	2 A	AO BF 24	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP- CEP/X67-R802		TV01
DESCRIPTION: SUPPRESSION CHAMBER EXHAUST (CIV)							
CEP-V-4B	M543-3 E9	2 A	AO GB 2	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CEP/X67-R802		TV01
DESCRIPTION: CEP-V-4A BYPASS (CIV)							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CIA-RV-5A	M556-1 H11	3 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: CIA TRAIN "A" NITROGEN HEADER RV						
CIA-RV-5B	M556-1 D11	3 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: CIA TRAIN "B" NITROGEN HEADER RV						
CIA-SPV-1A THRU 15A	M556-1 G12	3 B	SO SV 0.50	O FO NC	HJK RF OSP-CIA/IST-R702	ROJ15	N03 TV01
	DESCRIPTION: CIA NITROGEN BOTTLE AUTO ISO						
CIA-SPV-1B THRU 19B	M556-1 B12	3 B	SO SV 0.50	O FO NC	HJK RF OSP-CIA/IST-R702	ROJ15	N03 TV01
	DESCRIPTION: CIA NITROGEN BOTTLE AUTO ISO						
CIA-V-20	M556-1 K8	2 A	MO GB 0.75	C FAI NO	G 2Y OSP-CIA/IST-Q701 HJ CS OSP-CIA/IST-Q701 L J TSP-CIA/X56-C801	CSJ03	TV01
	DESCRIPTION: NORMAL CIA SUPPLY TO CONTAINMENT (OTBD CIV)						
CIA-V-21 CMP-01	M556-1 K6	2 AC	SA CK 0.75	O/C NA NO	Hx 8Y OSP-CIA/IST-R701 HxL J TSP- CIA/X56-C801	ROJ02	
	DESCRIPTION: NORMAL CIA SUPPLY TO CONTAINMENT CHK (INBD CIV)						
CIA-V-24A	M556-1 J5	2 AC	SA CK 0.50	C NA NC	HL RF OSP-MSIV/IST-R701	ROJ02	
	DESCRIPTION: CIA TO MS-V-22A (MSIV) OPERATOR CHK						
CIA-V-24B	M556-1 J4	2 AC	SA CK 0.50	C NA NC	HL RF OSP-MSIV/IST-R701	ROJ02	
	DESCRIPTION: CIA TO MS-V-22B (MSIV) OPERATOR CHK						
CIA-V-24C	M556-1 K5	2 AC	SA CK 0.50	C NA NC	HL RF OSP-MSIV/IST-R701	ROJ02	
	DESCRIPTION: CIA TO MS-V-22C (MSIV) OPERATOR CHK						
CIA-V-24D	M556-1 K4	2 AC	SA CK 0.50	C NA NC	HL RF OSP-MSIV/IST-R701	ROJ02	
	DESCRIPTION: CIA TO MS-V-22D (MSIV) OPERATOR CHK						
CIA-V-30A	M556-1 G9	2 A	MO GB 0.50	O/C FAI NO	G 2Y OSP-CIA/IST-Q701 HJ CS OSP-CIA/IST-Q701 L J TSP-CIA/X89B-C801	CSJ03	TV01
	DESCRIPTION: CIA SUPPLY TO 3 ADS ACCUMULATORS ISO (CIV)						
CIA-V-30B	M556-1 F9	2 A	MO GB 0.50	O/C FAI NO	G 2Y OSP-CIA/IST-Q701 HJ CS OSP-CIA/IST-Q701 L J TSP-CIA/X91-C801	CSJ03	TV01
	DESCRIPTION: CIA SUPPLY TO 4 ADS ACCUMULATORS ISO (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CIA-V-31A CMP-01	M556-1 G7	2 AC	SA CK 0.50	O/C NA NO	Hx 8Y OSP-CIA/IST-R701 HxL J TSP-CIA/X89B-C801	ROJ02	
	DESCRIPTION: CIA SUPPLY TO 3 ADS ACCUMULATORS CHK (INBD CIV)						
CIA-V-31B CMP-01	M556-1 F7	2 AC	SA CK 0.50	O/C NA NO	Hx 8Y OSP-CIA/IST-R701 HxL J TSP-CIA/X91-C801	ROJ02	
	DESCRIPTION: CIA SUPPLY TO 4 ADS ACCUMULATORS CHK (INBD CIV)						
CIA-V-39A	M556-1 J10	3 B	AO BA 0.50	C FC NO	G 2Y OSP-CIA/IST-Q702 HJK CS OSP-CIA/IST-Q702	CSJ04	TV01
	DESCRIPTION: CIA NORMAL SUPPLY TO BACKUP SUPPLY HEADER ISO						
CIA-V-39B	M556-1 E10	3 B	AO BA 0.50	C FC NO	G 2Y OSP-CIA/IST-Q702 HJK CS OSP-CIA/IST-Q702	CSJ04	TV01
	DESCRIPTION: CIA NORMAL SUPPLY TO BACKUP SUPPLY HEADER ISO						
CIA-V-40M (TYP 7)	M556-1 B5	2 AC	SA CK 0.50	O/C NA NO	HL RF OSP-CIA/IST-R701	ROJ02	
	DESCRIPTION: CIA TO ADS ACCUMULATOR CHK						
CIA-V-41A CMP-17	M556-1 J10	3 C	SA CK 0.50	C NA NO	Hx 4Y OSP-CIA/IST-R702 Di 8Y	CSJ04	
	DESCRIPTION: CIA NORMAL SUPPLY TO BACKUP SUPPLY HEADER CHK						
CIA-V-41B CMP-17	M556-1 D10	3 C	SA CK 0.50	C NA NO	Hx 4Y OSP-CIA/IST-R702 Di 8Y	CSJ04	
	DESCRIPTION: CIA NORMAL SUPPLY TO BACKUP SUPPLY HEADER CHK						
CIA-V-52A THRU 66A CMP-02	M556-1 G12	3 C	SA CK 0.50	O NA NC	Hx 4Y OSP-CIA/IST-R702	ROJ15	
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH CHK						
CIA-V-52B THRU 70B CMP-02	M556-1 C12	3 C	SA CK 0.50	O NA NC	Hx 4Y OSP-CIA/IST-R702	ROJ15	
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH CHK						
CIA-V-103A CMP-02	M556-1 H13	3 C	SA CK 0.50	O NA NC	Hx 4Y OSP-CIA/IST-R702	ROJ15	
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH CHK						
CIA-V-103B CMP-02	M556-1 D12	3 C	SA CK 0.50	O NA NC	Hx 4Y OSP-CIA/IST-R702	ROJ15	
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH CHK						
CIA-V-104A	M556-1 H13	3 B	MA GB 0.50	O NA NC	H 2Y OSP-CIA/IST-R702		
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH MAN ISO						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CIA-V-104B	M556-1 D12	3 B	MA GB 0.50	O NA NC	H 2Y OSP-CIA/IST-R702		
	DESCRIPTION: CIA NITROGEN BOTTLE DISCH MAN ISO						
CRD-V-10	M528-1 K6	2 B	AO GB 1	C FC NO	G 2Y OSP-CRD/IST-Q701 HJK Q OSP-CRD/IST-Q701		TV01
	DESCRIPTION: SCRAM DISCH VOLUME VENT						
CRD-V-11	M528-1 F7	2 B	AO GB 2	C FC NO	G 2Y OSP-CRD/IST-Q701 HJK Q OSP-CRD/IST-Q701		TV01
	DESCRIPTION: SCRAM DISCH VOLUME DRN						
CRD-V-114 (TYP 185)	M528-1 C4	D C	SA CK 0.75	O NA NC	H TS TSP-CRD-C101		N05
	DESCRIPTION: SCRAM DISCHARGE HEADER CHECK VALVE						
CRD-V-115 (TYP 185)	M528-1 B7	D C	SA CK 1	C NA NC	H RF OSP-CRD-R701		N05
	DESCRIPTION: CHARGING WATER CHECK VALVE						
CRD-V-126 (TYP 185)	M528-1 B6	D B	AO DI 1	O FO NC	H TS TSP-CRD-C101		N05
	DESCRIPTION: SCRAM INLET AOV						
CRD-V-127 (TYP 185)	M528-1 C4	D B	AO DI 0.75	O FO NC	H TS TSP-CRD-C101		N05
	DESCRIPTION: SCRAM OUTLET AOV						
CRD-V-138 (TYP 185)	M528-1 B6	D C	SA CK 0.75	C NA NO	H Q OSP-CRD-M701		N05
	DESCRIPTION: COOLING WATER CHECK VALVE						
CRD-V-180	M528-1 K6	2 B	AO GB 1	C FC NO	G 2Y OSP-CRD/IST-Q701 HJK Q OSP-CRD/IST-Q701		TV01
	DESCRIPTION: SCRAM DISCH VOLUME VENT						
CRD-V-181	M528-1 F6	2 B	AO GB 2	C FC NO	G 2Y OSP-CRD/IST-Q701 HJK Q OSP-CRD/IST-Q701		TV01
	DESCRIPTION: SCRAM DISCH VOLUME DRN						
CSP-RV-51	M619-161	2 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: BACKUP CONTROL AIR SUPPLY HEADER TO CSP-V-5,6,9 RV						
CSP-RV-52	M619-161	2 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: CSP-TK-51 RV (CONTROL AIR TO CSP-V-5,6,9)						
CSP-V-1	M543-3 G4	2 A	AO BF 30	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X53-R802		TV01
	DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CSP-V-2	M543-3 G5	2 A	AO BF 30	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X53-R802		TV01
DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)							
CSP-V-3	M543-3 F3	2 A	AO BF 24	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X66-R803		TV01
DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)							
CSP-V-4	M543-3 E3	2 A	AO BF 24	C FC NC	G 2Y OSP-CONT/IST-Q701 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X66-R803		TV01
DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)							
CSP-V-5	M543-3 C2	2 A	AO BF 24	O/C FO NC	GS 2Y ISP-CSP/IST-B101 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X66-R802		TV01
DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)							
CSP-V-6	M543-3 C9	2 A	AO BF 24	O/C FO NC	GS 2Y ISP-CSP/IST-B101 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X67-R801		TV01
DESCRIPTION: CSP TO CONTAINMENT ISO (CIV)							
CSP-V-7	M543-3 C2	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y ISP-CSP/IST-B101 H Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X66-R802		N02
DESCRIPTION: VACUUM RELIEF TO SUPPRESSION CHAMBER (CIV)							
CSP-V-8	M543-3 C10	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y ISP-CSP/IST-B101 H Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X67-R801		N02
DESCRIPTION: VACUUM RELIEF (CIV)							
CSP-V-9	M543-3 C5	2 A	AO BF 24	O/C FO NC	GS 2Y ISP-CSP/IST-B101 HJK Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X119-R801		TV01
DESCRIPTION: VACUUM RELIEF TO SUPPRESSION CHAMBER (CIV)							
CSP-V-10	M543-3 C4	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y ISP-CSP/IST-B101 H Q OSP-CONT/IST-Q701 L 2Y TSP-CSP/X119-R801		N02
DESCRIPTION: VACUUM RELIEF (CIV)							
CSP-V-65	M619-161	2 AC	SA CK 1.50	C NA NC	HL RF OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: CONTROL AIR CHK TO CIVs, ISOLATES SR FROM NSR AIR							
CSP-V-70 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-71 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-72 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CSP-V-73 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-74 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-75 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-76 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-77 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-78 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-79 CMP-03	M619-161	2 C	SA CK 1	O NA NC	Hx 4Y OSP-CSP/IST-R701	ROJ09	
DESCRIPTION: BACKUP CONTROL AIR SUPPLY CHK TO CIVs (CSP-V-5,6,9)							
CSP-V-93	M543-3 B5	2 A	SO SV 1	C FC NC	HJK Q OSP-CONT/IST-Q701 G 2Y TSP-CSP/X66-R801 L J TSP-CSP/X66-R801		TV01
DESCRIPTION: CONTAINMENT N2 SUPPLY (CIV)							
CSP-V-96	M543-3 F5	2 A	SO SV 1	C FC NC	HJK Q OSP-CONT/IST-Q701 G 2Y TSP-CSP/X53/R801 L J TSP-CSP/X53/R801		TV01
DESCRIPTION: CONTAINMENT N2 SUPPLY (CIV)							
CSP-V-97	M543-3 F4	2 A	SO SV 1	C FC NC	HJK Q OSP-CONT/IST-Q701 G 2Y TSP-CSP/X53/R801 L J TSP-CSP/X53/R801		TV01
DESCRIPTION: CONTAINMENT N2 SUPPLY (CIV)							
CSP-V-98	M543-3 B4	2 A	SO SV 1	C FC NC	HJK Q OSP-CONT/IST-Q701 G 2Y TSP-CSP/X66/R801 L J TSP-CSP/X66/R801		TV01
DESCRIPTION: CONTAINMENT N2 SUPPLY (CIV)							
CVB-V-1AB	M543-1 B13	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
DESCRIPTION: VACUUM RELIEF TO DRYWELL							
CVB-V-1CD	M543-1 B12	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
DESCRIPTION: VACUUM RELIEF TO DRYWELL							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
CVB-V-1EF	M543-1 B11	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1GH	M543-1 B11	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1JK	M543-1 B9	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1LM	M543-1 B9	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1NP	M543-1 B8	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1QR	M543-1 B7	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
CVB-V-1ST	M543-1 B7	2 AC	AO,SA CK 24	O/C NA NC	GS 2Y MSP-CVB/IST-B101 H Q OSP-CVB/IST-M701 L 2Y TSP-CONT-B801 TSP-CVB-R801	RV01	N02 TV03
	DESCRIPTION: VACUUM RELIEF TO DRYWELL						
DO-V-1A	M512-4 C11	3 C	SA CK 1.50	O NA NC	H N OSP-DO/IST-Q701		N15
	DESCRIPTION: DO-P-1A (TRANSFER PUMP) DISCH CHK						
DO-V-1B	M512-4 H11	3 C	SA CK 1.50	O NA NC	H N OSP-DO/IST-Q702		N15
	DESCRIPTION: DO-P-1B (TRANSFER PUMP) DISCH CHK						
DO-V-10	M512-4 D1	3 C	SA CK 1.50	O NA NC	H N OSP-DO/IST-Q703		N15
	DESCRIPTION: DO-P-2 (TRANSFER PUMP) DISCH CHK						
DSA-SPV-5A1/2	M512-2 F10	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B701		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5A1/4	M512-2 E10	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B701		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5A2/2	M512-2 F6	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B701		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
DSA-SPV-5A2/4	M512-2 E6	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B701		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5B1/2	M512-3 F10	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B702		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5B1/4	M512-3 E10	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B702		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5B2/2	M512-3 F6	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B702		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5B2/4	M512-3 E6	D B	SO SV 2	O/C FC NC	H N TSP-DSA-B702		N06
	DESCRIPTION: DSA TO EDG START MOTORS BYPASS/VENT VLV						
DSA-SPV-5C1/1	M512-1 F9	D B	SO SV 1.50	O FC NC	H N TSP-DSA-B703		N06
	DESCRIPTION: DSA TO EDG START MOTORS ISO						
DSA-SPV-5C1/2	M512-1 F9	D B	SO SV 1.50	O FC NC	H N TSP-DSA-B703		N06
	DESCRIPTION: DSA TO EDG START MOTORS ISO						
DW-V-156	M517 G8	2 A	MA GT 2	C NA LC	L J TSP-DW/X92-C801		Passive
	DESCRIPTION: DEMIN WATER TO CONTAINMENT ISO (OTBD CIV)						
DW-V-157	M517 G8	2 A	MA GT 2	C NA LC	L J TSP-DW/X92-C801		Passive
	DESCRIPTION: DEMIN WATER TO CONTAINMENT ISO (INBD CIV)						
EDR-V-19	M537 D9	2 A	AO GT 3	C FC NO	G 2Y OSP-EDR/IST-Q701 HJK Q OSP-EDR/IST-Q701 L J TSP-EDR/X23-C801		TV01
	DESCRIPTION: EDR ISO FROM DRYWELL SUMP (CIV)						
EDR-V-20	M537 D9	2 A	AO GT 3	C FC NO	G 2Y OSP-EDR/IST-Q701 HJK Q OSP-EDR/IST-Q701 L J TSP-EDR/X23-C801		TV01
	DESCRIPTION: EDR ISO FROM DRYWELL SUMP (CIV)						
EDR-V-394	M537 C15	3 B	AO GT 3	C FC NO	G 2Y OSP-EDR/IST-Q702 HJK Q OSP-EDR/IST-Q702		TV01
	DESCRIPTION: EDR INBD SECONDARY CTMT ISO						
EDR-V-395	M537 C15	3 B	AO GT 3	C FC NO	G 2Y OSP-EDR/IST-Q702 HJK Q OSP-EDR/IST-Q702		TV01
	DESCRIPTION: EDR INBD SECONDARY CTMT ISO						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
FDR-V-3	M539 D6	2 A	AO BF 3	C FC NO	G 2Y OSP-FDR/IST-Q701 HJK Q OSP-FDR/IST-Q701 L J TSP-FDR/X24-C801		TV01
DESCRIPTION: FDR ISO FROM DRYWELL FDR-SUMP-3 (CIV)							
FDR-V-4	M539 D6	2 A	AO BF 3	C FC NO	G 2Y OSP-FDR/IST-Q701 HJK Q OSP-FDR/IST-Q701 L J TSP-FDR/X24-C801		TV01
DESCRIPTION: FDR ISO FROM DRYWELL FDR-SUMP-3 (CIV)							
FDR-V-219	M539 D14	3 B	AO GT 3	C FC NO	G 2Y OSP-FDR/IST-Q702 HJK Q OSP-FDR/IST-Q702		TV01
DESCRIPTION: FDR INBD SECONDARY CTMT ISO							
FDR-V-220	M539 D15	3 B	AO GT 3	C FC NO	G 2Y OSP-FDR/IST-Q702 HJK Q OSP-FDR/IST-Q702		TV01
DESCRIPTION: FDR INBD SECONDARY CTMT ISO							
FDR-V-221	M539 D14	3 B	AO GT 3	C FC NO	G 2Y OSP-FDR/IST-Q702 HJK Q OSP-FDR/IST-Q702		TV01
DESCRIPTION: FDR INBD SECONDARY CTMT ISO							
FDR-V-222	M539 D15	3 B	AO GT 3	C FC NO	G 2Y OSP-FDR/IST-Q702 HJK Q OSP-FDR/IST-Q702		TV01
DESCRIPTION: FDR INBD SECONDARY CTMT ISO							
FPC-FCV-1	M526-1 B8	3 B	AO GB 4 X 6	O FO NC	G 2Y OSP-FPC/IST-Q701 HJK Q OSP-FPC/IST-Q701		TV01
DESCRIPTION: FPC DEMINERALIZER BYPASS FCV							
FPC-RV-117A	M526-1 D10	3 C	SA RV 0.75	NA NA NC	P RV TSP-RV/IST-R701		TV02
DESCRIPTION: FPC-HX-1A RV							
FPC-RV-117B	M526-1 C11	3 C	SA RV 0.75	NA NA NC	P RV TSP-RV/IST-R701		TV02
DESCRIPTION: FPC-HX-1B RV							
FPC-V-112A	M526-1 E12	3 C	SA CK 6	O/C NA NC	H Q OSP-FPC/IST-Q701		
DESCRIPTION: FPC-P-1A DISCH CHK							
FPC-V-112B	M526-1 C12	3 C	SA CK 6	O/C NA NC	H Q OSP-FPC/IST-Q701		
DESCRIPTION: FPC-P-1B DISCH CHK							
FPC-V-127 CMP-19	M526-1 E6	3 C	SA CK 2	O/C NA NC	Hx 4Y OSP-FPC/IST-Q701 Nit 4Y OSP-FPC/IST-Q701		
DESCRIPTION: SW TO FPC CHK							
FPC-V-140 CMP-20	M526-1 C6	3 C	SA CK 8	C NA NO	Hx 4Y OSP-FPC/IST-Q701 Di 10Y		
DESCRIPTION: FPC DEMIN EFF CHK							

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
FPC-V-146A CMP-20	M526-1 J10	3 C	SA CK 8	O NA NO	Hx 4Y OSP-FPC/IST-Q701 Nit 4Y OSP-FPC/IST-Q701 Di 10Y		
	DESCRIPTION: FPC TO FUEL POOL CHK						
FPC-V-146B CMP-20	M526-1 J10	3 C	SA CK 8	O NA NO	Hx 4Y OSP-FPC/IST-Q701 Nit 4Y OSP-FPC/IST-Q701 Di 10Y		
	DESCRIPTION: FPC TO FUEL POOL CHK						
FPC-V-149	M526-1 C7	2 A	MO GT 6	C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701 L J TSP-FPC/X101-C801		TV01
	DESCRIPTION: FPC TO SUPPRESSION POOL ISO (CIV)						
FPC-V-153	M526-1 A11	2 A	MO GT 6	C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701 L 2Y TSP-FPC/X100-B801		TV01
	DESCRIPTION: SUPPRESSION POOL TO FPC-P-3 SUCT (CIV)						
FPC-V-154	M526-1 A10	2 A	MO GT 6	C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701 L 2Y TSP-FPC/X100-B801		TV01
	DESCRIPTION: SUPPRESSION POOL TO FPC-P-3 SUCT (CIV)						
FPC-V-156	M526-1 B10	2 A	MO GT 6	C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701 L J TSP-FPC/X101-C801		TV01
	DESCRIPTION: FPC TO SUPPRESSION POOL ISO (CIV)						
FPC-V-157A CMP-14	M526-1 J10	3 C	SA CK 0.5	O NA NC	Hx Q OSP-FPC/IST-Q701 Di 6Y		N04
	DESCRIPTION: FPC TO FUEL POOL VACUUM BKR CHK						
FPC-V-157B CMP-14	M526-1 J10	3 C	SA CK 0.5	O NA NC	Hx Q OSP-FPC/IST-Q701 Di 6Y		N04
	DESCRIPTION: FPC TO FUEL POOL VACUUM BKR CHK						
FPC-V-172	M526-1 B5	3 B	MO GT 8	C FAI NO	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: FPC TO SUPPRESSION POOL ISO						
FPC-V-173	M526-1 B5	3 B	MO GT 8	C FAI NO	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: FPC INFLUENT TO DEMIN ISO						
FPC-V-175	M526-1 C9	3 B	MO GT 8	O FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: FPC FLTR DEMIN BYPASS						
FPC-V-181A	M526-1 E14	3 B	MO GT 8	NA FAI NO	G 2Y OSP-FPC/IST-Q701		Passive
	DESCRIPTION: FPC-P-1A SUCT						
FPC-V-181B	M526-1 C14	3 B	MO GT 8	NA FAI NO	G 2Y OSP-FPC/IST-Q701		Passive
	DESCRIPTION: FPC-P-1B SUCT						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
FPC-V-184	M526-1 C5	3 B	MO GT 8	C FAI NO	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: FPC FILTER DEMIN EFFLUENT ISO						
HPCS-RV-14	M520 C6	2 AC	SA RV 1 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: HPCS-P-3 SUCT THERMAL RELIEF (CIV)						
HPCS-RV-35	M520 C4	2 AC	SA RV 1.5 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: HPCS-P-3 DISCH THERMAL RELIEF (CIV)						
HPCS-V-1	M520 C7	2 B	MO GT 14	O/C FAI NO	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01
	DESCRIPTION: CST TO HPCS-P-1 SUCT						
HPCS-V-2	M520 C6	2 C	SA CK 20	O/C NA NC	H Q OSP-HPCS/IST-Q701		
	DESCRIPTION: CST TO HPCS-P-1 SUCT CHK						
HPCS-V-4	M520 G7	1 A	MO GT 12	O/C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701 L 2Y TSP-RCS-R803		TV01
	DESCRIPTION: HPCS TO RPV ISO (OTBD CIV)						
HPCS-V-5	M520 H8	1 AC	SA CK 12	O/C NA NC	H RF OSP-HPCS/IST-R701 HL RF TSP-RCS-R803	ROJ08	
	DESCRIPTION: HPCS TO RPV ISO (INBD CIV)						
HPCS-V-6 CMP-21	M520 C5	2 C	SA SC 1.50	C NA NO	Hx Q OSP-HPCS/IST-Q701 Hx 12M OSP-HPCS-A701		N01
	DESCRIPTION: HPCS-P-3 (WATER LEG) DISCH STOP CHK						
HPCS-V-7 CMP-21	M520 C5	2 C	SA CK 1.50	C NA NO	Hx Q OSP-HPCS/IST-Q701 Hx 12M OSP-HPCS-A701		N01
	DESCRIPTION: HPCS-P-3 (WATER LEG) DISCH CHK						
HPCS-V-10	M520 E3	2 B	MO GB 10	C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01
	DESCRIPTION: HPCS TO CST ISO						
HPCS-V-11	M520 E3	2 B	MO GB 10	C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01
	DESCRIPTION: HPCS TO CST ISO						
HPCS-V-12	M520 B5	2 B	MO GT 4	O/C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01, N16
	DESCRIPTION: HPCS-P-1 MINIMUM FLOW VLV (CIV)						
HPCS-V-15	M520 D7	2 B	MO GT 18	O/C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01, N16
	DESCRIPTION: SUPPRESSION POOL TO HPCS-P-1 SUCT (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
HPCS-V-16	M520 D6	2 C	SA CK 24	O NA NC	H Q OSP-HPCS/IST-Q701		
	DESCRIPTION: SUPPRESSION POOL TO HPCS-P-1 SUCT CHK						
HPCS-V-23	M520 E5	2 B	MO GB 12	C FAI NC	G 2Y OSP-HPCS/IST-Q701 HJ Q OSP-HPCS/IST-Q701		TV01, N16
	DESCRIPTION: HPCS TEST LINE TO SUPPRESSION POOL ISO (CIV)						
HPCS-V-24	M520 B4	2 C	SA CK 16	O/C NA NC	H Q OSP-HPCS/IST-Q701		
	DESCRIPTION: HPCS-P-1 DISCH CHK						
HPCS-V-28 CMP-23	M524-1 G6	3 C	SA CK 8	O NA NC	Hx Q OSP-SW/IST-Q703 Nit 4Y OSP-SW/IST-Q703 Di 10Y		
	DESCRIPTION: HPCS-P-2 (SERVICE WATER) DISCH CHK						
HPCS-V-65	M520 H7	2 A	MA GB 1	C NA LC	L J TSP-HPCS/X78E-C801		Passive
	DESCRIPTION: AIR TO HPCS-V-5 OPERATOR (INBD CIV)						
HPCS-V-68	M520 H7	2 A	MA GB 1	C NA LC	L J TSP-HPCS/X78E-C801		Passive
	DESCRIPTION: AIR TO HPCS-V-5 OPERATOR (OTBD CIV)						
LPCS-FCV-11	M520 B13	2 B	MO GB 3	O/C FAI NC	G 2Y OSP-LPCS/IST-Q702 HJ Q OSP-LPCS/IST-Q702		TV01, N16
	DESCRIPTION: LPCS-P-1 MINIMUM FCV (CIV)						
LPCS-RV-18	M520 G12	2 AC	SA RV 1.5 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: LPCS-P-1 THERMAL RELIEF (CIV)						
LPCS-RV-31	M520 D12	2 AC	SA RV 1 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: LPCS-P-2 SUCT THERMAL RELIEF (CIV)						
LPCS-V-1	M520 D11	2 B	MO GT 24	O/C FAI NO	G 2Y OSP-LPCS/IST-Q702 HJ Q OSP-LPCS/IST-Q702		TV01, N16
	DESCRIPTION: SUPPRESSION POOL TO LPCS-P-1 SUCT (CIV)						
LPCS-V-3	M520 B13	2 C	SA CK 16	O/C NA NC	H Q OSP-LPCS/IST-Q702		
	DESCRIPTION: LPCS-P-1 DISCH CHK						
LPCS-V-5	M520 G11	1 A	MO GT 12	O/C FAI NC	G 2Y OSP-LPCS/IST-Q701 HJ CS OSP-LPCS/IST-Q701 L 2Y TSP-RCS-R801	CSJ06	TV01
	DESCRIPTION: LPCS TO RPV ISO (OTBD CIV)						
LPCS-V-6	M520 H9	1 AC	SA CK 12	O/C NA NC	H RF OSP-LPCS/IST-R701 HL RF TSP-RCS-R801	ROJ08	
	DESCRIPTION: LPCS TO RPV ISO CHK (INBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
LPCS-V-12	M520 E14	2 B	MO GB 12	C FAI NC	G 2Y OSP-LPCS/IST-Q702 HJ Q OSP-LPCS/IST-Q702		TV01, N16
	DESCRIPTION: LPCS TEST LINE TO SUPPRESSION POOL ISO (CIV)						
LPCS-V-33 CMP-21	M520 C12	2 C	SA CK 1.50	C NA NO	Hx Q OSP-LPCS/IST-Q702 Hx 12M OSP-LPCS-A702		N01
	DESCRIPTION: LPCS-P-2 (WATER LEG) DISCH CHK						
LPCS-V-34 CMP-21	M520 C13	2 C	SA SC 1.50	C NA NO	Hx Q OSP-LPCS/IST-Q702 Hx 12M OSP-LPCS-A702		N01
	DESCRIPTION: LPCS-P-2 (WATER LEG) DISCH STOP CHK						
LPCS-V-66	M520 H10	2 A	MA GB 1	C NA LC	L J TSP-LPCS/X78D-C801		Passive
	DESCRIPTION: AIR TO LPCS-V-6 OPERATOR (INBD CIV)						
LPCS-V-67	M520 H10	2 A	MA GB 1	C NA LC	L J TSP-LPCS/X78D-C801		Passive
	DESCRIPTION: AIR TO LPCS-V-6 OPERATOR (OTBD CIV)						
MS-RV-1A	M529 F11	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						
MS-RV-1B	M529 D11	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						
MS-RV-1C	M529 F6	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						
MS-RV-1D	M529 E7	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						
MS-RV-2A	M529 F10	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						
MS-RV-2B	M529 D10	1 C	AO,SA SR 6 X 10	NA NA NC	G 2Y TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM			Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
MS-RV-2C	M529 F7	1 C	AO,SA SR 6 X 10	NA NA NC	G P	2Y RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV								
MS-RV-2D	M529 E7	1 C	AO,SA SR 6 X 10	NA NA NC	G P	2Y RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV								
MS-RV-3A	M529 F9	1 C	AO,SA SR 6 X 10	NA NA NC	G P	2Y RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV								
MS-RV-3B	M529 D10	1 C	AO,SA SR 6 X 10	NA NA NC	G P	2Y RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV								
MS-RV-3C	M529 E7	1 C	AO,SA SR 6 X 10	NA NA NC	G P	2Y RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	TV02
	DESCRIPTION: MAIN STEAM SAFETY RV								
MS-RV-3D	M529 E8	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								
MS-RV-4A	M529 F9	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								
MS-RV-4B	M529 D9	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								
MS-RV-4C	M529 F8	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								
MS-RV-4D	M529 E8	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								
MS-RV-5B	M529 E9	1 C	AO,SA SR 6 X 10	O NA NC	G P	RF RV	TSP-MSRV/IST-R701 ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV								

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
MS-RV-5C	M529 F8	1 C	AO,SA SR 6 X 10	O NA NC	G RF TSP-MSRV/IST-R701 P RV ISP-MS/IST-R101 MSP-MS/IST-R101 ISP-MS/IST-A101	RV03	N08 TV02
	DESCRIPTION: MAIN STEAM & ADS SAFETY RV						
MS-V-16	M529 B13	1 A	MO GT 3	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L J TSP-MS/X22-C801	CSJ12	TV01
	DESCRIPTION: MAIN STEAM DRN ISO (INBD CIV)						
MS-V-19	M529 B14	1 A	MO GT 3	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L J TSP-MS/X22-C801	CSJ12	TV01 DC MOV
	DESCRIPTION: MAIN STEAM DRN ISO (OTBD CIV)						
MS-V-20	M529 C15	2 B	MO GB 3	C FAI NC	G 2Y OSP-MS/IST-Q702		Passive
	DESCRIPTION: MS LINE DRN ISO (MUST CLOSE FOR MSLC OPERATION)						
MS-V-22A	M529 F12	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (INBD CIV)						
MS-V-22B	M529 E12	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (INBD CIV)						
MS-V-22C	M529 F5	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (INBD CIV)						
MS-V-22D	M529 E5	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (INBD CIV)						
MS-V-28A	M529 F13	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (OTBD CIV)						
MS-V-28B	M529 E13	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (OTBD CIV)						
MS-V-28C	M529 F4	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (OTBD CIV)						
MS-V-28D	M529 E4	1 A	AO GB 26	C FC NO	G 2Y OSP-MS/IST-Q701 HJK CS OSP-MS/IST-Q701 L 2Y TSP-MSIV-B801	CSJ08	TV01
	DESCRIPTION: MAIN STEAM ISO VLV (OTBD CIV)						
MS-V-37A (TYP 18)	M529 C11	3 C	SA CK 10	O NA NC	HS RF MSP-MS/IST-R701	ROJ07	
	DESCRIPTION: VACUUM BREAKER ON MSRV TAILPIPE						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
MS-V-38A (TYP 18)	M529 C11	3 C	SA CK 10	O NA NC	HS RF MSP-MS/IST-R701	ROJ07	
	DESCRIPTION: VACUUM BREAKER ON MSRV TAILPIPE						
MS-V-67A	M529 F13	1 A	MO GT 1.50	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L 2Y TSP-MSIV-B801	CSJ10	TV01
	DESCRIPTION: MS-V-28A BODY DRN (OTBD CIV)						
MS-V-67B	M529 D13	1 A	MO GT 1.50	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L 2Y TSP-MSIV-B801	CSJ10	TV01
	DESCRIPTION: MS-V-28B BODY DRN (OTBD CIV)						
MS-V-67C	M529 F4	1 A	MO GT 1.50	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L 2Y TSP-MSIV-B801	CSJ10	TV01
	DESCRIPTION: MS-V-28C BODY DRN (OTBD CIV)						
MS-V-67D	M529 D4	1 A	MO GT 1.50	C FAI NC	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702 L 2Y TSP-MSIV-B801	CSJ10	TV01
	DESCRIPTION: MS-V-28D BODY DRN (OTBD CIV)						
MS-V-146	M502-1 B7	2 B	MO GT 24	C FAI NO	G 2Y OSP-MS/IST-Q702 HJ CS OSP-MS/IST-Q702	CSJ09	TV01
	DESCRIPTION: MS SUPPLY TO AUXILIARIES						
MSLC-V-3A	M557 C9	1 A	MA GT 1.50	C NA LC	L 2Y TSP-MSIV-B801		N14 Passive
	DESCRIPTION: MS VENT TO SGT AND REACTOR BUILDING (OTBD CIV)						
MSLC-V-3B	M557 C8	1 A	MA GT 1.50	C NA LC	L 2Y TSP-MSIV-B801		N14 Passive
	DESCRIPTION: MS VENT TO SGT AND REACTOR BUILDING (OTBD CIV)						
MSLC-V-3C	M557 E9	1 A	MA GT 1.50	C NA LC	L 2Y TSP-MSIV-B801		N14 Passive
	DESCRIPTION: MS VENT TO SGT AND REACTOR BUILDING (OTBD CIV)						
MSLC-V-3D	M557 E8	1 A	MA GT 1.50	C NA LC	L 2Y TSP-MSIV-B801		N14 Passive
	DESCRIPTION: MS VENT TO SGT AND REACTOR BUILDING (OTBD CIV)						
PI-EFC-X29B	M543-1 H8	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: DRYWELL ATM TO CMS-PT-6 EFC (CIV)						
PI-EFC-X29F	M543-1 H7	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: DRYWELL ATM TO CMS-PT-2 EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X30A	M543-1 G13	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: DRYWELL ATM TO CMS-PT-5 EFC (CIV)						
PI-EFC-X30F	M543-1 F13	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: DRYWELL ATM TO CMS-PT-1 EFC (CIV)						
PI-EFC-X37E	M521-1 D6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
	DESCRIPTION: RHR SDC A SUPPLY TO DPIS EFC (CIV)						
PI-EFC-X37F	M521-1 D6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
	DESCRIPTION: RHR SDC A SUPPLY TO DPIS EFC (CIV)						
PI-EFC-X38A	M529 C13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE B TO DPIS HI SIDE EFC (CIV)						
PI-EFC-X38B	M529 D13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE B TO DPIS LO SIDE EFC (CIV)						
PI-EFC-X38C	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-7B EFC (CIV)						
PI-EFC-X38D	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-7B EFC (CIV)						
PI-EFC-X38E	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-13B EFC (CIV)						
PI-EFC-X38F	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-13B EFC (CIV)						
PI-EFC-X39A	M521-2 H13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE B TO DPIS HI SIDE EFC (CIV)						
PI-EFC-X39B	M529 D13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE B TO DPIS LO SIDE EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X39D	M521-2 H13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RHR LPCI B INJECTION TO DPIS-29B EFC (CIV)						
PI-EFC-X39E	M521-2 H13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RHR LPCI C INJECTION TO DPIS-29B EFC (CIV)						
PI-EFC-X40C	M530-1 F12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
	DESCRIPTION: RRC A TO FT-14A,14B,11A EFC (CIV)						
PI-EFC-X40D	M530-1 F12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
	DESCRIPTION: RRC A TO FT-14A,14B,11A EFC (CIV)						
PI-EFC-X40E	M530-1 C14	2 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC A (RRC-P-1A) TO PI-1A,602A EFC (CIV)						
PI-EFC-X40F	M530-1 C14	2 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC A (RRC-P-1A) TO PI-2A,603A EFC (CIV)						
PI-EFC-X41C	M530-1 B4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC B (RRC-P-1B) TO DPT-15B EFC (CIV)						
PI-EFC-X41D	M530-1 C4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC B (RRC-P-1B) TO DPT-15B EFC (CIV)						
PI-EFC-X41E	M530-1 B4	2 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC B (RRC-P-1B) TO PI-1B,602B EFC (CIV)						
PI-EFC-X41F	M530-1 C4	2 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC B (RRC-P-1B) TO PI-2B,603B EFC (CIV)						
PI-EFC-X42A	M529 C4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE D TO DPIS HI SIDE EFC (CIV)						
PI-EFC-X42B	M529 C4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE D TO DPIS LO SIDE EFC (CIV)						
PI-EFC-X42C	M543-2 E6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: H2-O2 MONITOR TO DRYWELL ATM SAMPLE EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X42F	M529 H5	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: DRYWELL ATM TO PRESS INST EFC (CIV)						
PI-EFC-X44AA	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 11 TO FLOW INST EFC (CIV)						
PI-EFC-X44AB	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 12 TO FLOW INST EFC (CIV)						
PI-EFC-X44AC	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 13 TO FLOW INST EFC (CIV)						
PI-EFC-X44AD	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 14 TO FLOW INST EFC (CIV)						
PI-EFC-X44AE	M530-1 J6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 15 TO FLOW INST EFC (CIV)						
PI-EFC-X44AF	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 16 TO FLOW INST EFC (CIV)						
PI-EFC-X44AG	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 17 TO FLOW INST EFC (CIV)						
PI-EFC-X44AH	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 19 TO FLOW INST EFC (CIV)						
PI-EFC-X44AJ	M530-1 E2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 18 TO FLOW INST EFC (CIV)						
PI-EFC-X44AK	M530-1 J6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 20 TO FLOW INST EFC (CIV)						
PI-EFC-X44AL	M530-1 H6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 15 TO FLOW INST EFC (CIV)						
PI-EFC-X44AM	M530-1 H6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 20 TO FLOW INST EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X44BA	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 1 TO FLOW INST EFC (CIV)						
PI-EFC-X44BB	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 2 TO FLOW INST EFC (CIV)						
PI-EFC-X44BC	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 3 TO FLOW INST EFC (CIV)						
PI-EFC-X44BD	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 4 TO FLOW INST EFC (CIV)						
PI-EFC-X44BE	M530-1 J11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 5 TO FLOW INST EFC (CIV)						
PI-EFC-X44BF	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 6 TO FLOW INST EFC (CIV)						
PI-EFC-X44BG	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 7 TO FLOW INST EFC (CIV)						
PI-EFC-X44BH	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 8 TO FLOW INST EFC (CIV)						
PI-EFC-X44BJ	M530-1 F2	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 9 TO FLOW INST EFC (CIV)						
PI-EFC-X44BK	M530-1 J11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 10 TO FLOW INST EFC (CIV)						
PI-EFC-X44BL	M530-1 H11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 5 TO FLOW INST EFC (CIV)						
PI-EFC-X44BM	M530-1 H11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: JET PUMP NO 10 TO FLOW INST EFC (CIV)						
PI-EFC-X61A	M530-1 F12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
	DESCRIPTION: RRC A TO FT-14C,14D EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X61B	M530-1 F12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
DESCRIPTION: RRC A TO FT-14C,14D EFC (CIV)							
PI-EFC-X61C	M529 G5	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: DRYWELL ATM TO PRESS INST EFC (CIV)							
PI-EFC-X62B	M529 H12	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: DRYWELL ATM TO PRESS INST EFC (CIV)							
PI-EFC-X62C	M530-1 F6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
DESCRIPTION: RRC B TO FT-24C,24D EFC (CIV)							
PI-EFC-X62D	M530-1 F6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
DESCRIPTION: RRC B TO FT-24C,24D EFC (CIV)							
PI-EFC-X66	M543-1 B6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL ATM TO CSP-DPT-5 EFC (CIV)							
PI-EFC-X67	M543-1 B13	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL ATM TO CSP-DPT-4 EFC (CIV)							
PI-EFC-X69A	M529 C4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE D TO DPIS HI SIDE EFC (CIV)							
PI-EFC-X69B	M529 C4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE D TO DPIS LO SIDE EFC (CIV)							
PI-EFC-X69E	M530 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
DESCRIPTION: RRC B TO PS-18B EFC (CIV)							
PI-EFC-X69F	M529 H12	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: DRYWELL ATM TO PS-48A,48C,2B EFC (CIV)							
PI-EFC-X70A	M529 E4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE C TO DPIS HI SIDE EFC (CIV)							
PI-EFC-X70B	M529 E4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE C TO DPIS LO SIDE EFC (CIV)							

Valve EPN	Dwg & Coord	Class & Cat	Type / Actuat, Valve & Size	Position / Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X70C	M529 E13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE A TO DPIS HI SIDE EFC (CIV)							
PI-EFC-X70D	M529 E13	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE A TO DPIS LO SIDE EFC (CIV)							
PI-EFC-X70E	M530-1 B14	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
DESCRIPTION: RRC A (RRC-P-1A) TO DPT-15A EFC (CIV)							
PI-EFC-X70F	M530-1 B14	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
DESCRIPTION: RRC A (RRC-P-1A) TO DPT-15A EFC (CIV)							
PI-EFC-X71A	M529 E4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE C TO DPIS HI SIDE EFC (CIV)							
PI-EFC-X71B	M529 E4	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
DESCRIPTION: MAIN STEAM LINE C TO DPIS LO SIDE EFC (CIV)							
PI-EFC-X71C	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-7A EFC (CIV)							
PI-EFC-X71D	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-7A EFC (CIV)							
PI-EFC-X71E	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-13A EFC (CIV)							
PI-EFC-X71F	M519 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
DESCRIPTION: RCIC STEAM SUPPLY TO DPIS-13A EFC (CIV)							
PI-EFC-X72A	M529 J6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV STEAM DOME TO PRESS INST EFC (CIV)							
PI-EFC-X73A	M520 J8	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
DESCRIPTION: HPCS TO RPV TO DPIS-9 EFC (CIV)							
PI-EFC-X74A	M530-1 G12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
DESCRIPTION: SLC INJ BELOW CORE PLATE TO FLOW INSTR EFC (CIV)							
PI-EFC-X74B	M521-1 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
DESCRIPTION: RHR LPCI A INJECTION TO DPIS-29A EFC (CIV)							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X74E	M530-1 H11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC A TO RHR PUMPS TO DPIS-12A EFC (CIV)						
PI-EFC-X74F	M530-1 H11	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC A TO RHR PUMPS TO DPIS-12A EFC (CIV)						
PI-EFC-X75A	M530-1 G6	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: SLC INJ BELOW CORE PLATE TO FLOW INSTR EFC (CIV)						
PI-EFC-X75B	M530-1 G12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: SLC INJ ABOVE CORE PLATE TO FLOW INSTR EFC (CIV)						
PI-EFC-X75C	M529 E12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE A TO DPIS EFC (CIV)						
PI-EFC-X75D	M529 E12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B101	RV04	
	DESCRIPTION: MAIN STEAM LINE A TO DPIS EFC (CIV)						
PI-EFC-X75E	M530-1 F5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
	DESCRIPTION: RRC B TO FT-24A,24B EFC (CIV)						
PI-EFC-X75F	M530-1 F5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B106	RV04	
	DESCRIPTION: RRC B TO FT-24A,24B EFC (CIV)						
PI-EFC-X78A	M543-2 E14	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: H2-O2 MONITOR TO DRYWELL ATM SAMPLE ISO (CIV)						
PI-EFC-X78B	M520 J10	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: LPCS TO RPV TO RHR-DPS-29A EFC (CIV)						
PI-EFC-X78C	M523 F12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B103	RV04	
	DESCRIPTION: RWCU TO RWCU-FT-37 EFC (CIV)						
PI-EFC-X78F	M530-1 H12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B104	RV04	
	DESCRIPTION: RRC A (RRC-P-1A SUCT) TO PS-18A EFC (CIV)						
PI-EFC-X79A	M523 F15	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RWCU TO RWCU-FT-36 EFC (CIV)						
PI-EFC-X79B	M523 F15	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B105	RV04	
	DESCRIPTION: RWCU TO RWCU-FT-36 EFC (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X82B	M543-1 B14	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL ATM TO PT-3 EFC (CIV)							
PI-EFC-X84A	M543-1 B6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL ATM TO PT-4 EFC (CIV)							
PI-EFC-X86A	M543-1 B14	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL TO LT-1 EFC (CIV)							
PI-EFC-X86B	M543-1 B14	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL TO LT-1 EFC (CIV)							
PI-EFC-X87A	M543-1 B6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL TO LT-2 EFC (CIV)							
PI-EFC-X87B	M543-1 B6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
DESCRIPTION: WETWELL TO LT-2 EFC (CIV)							
PI-EFC-X106	M529 H12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X107	M529 H12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X108	M529 G12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X109	M529 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X110	M529 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X111	M529 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							
PI-EFC-X112	M529 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
DESCRIPTION: RPV TO PRESS INST EFC (CIV)							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-EFC-X113	M529 H5	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
	DESCRIPTION: RPV TO PRESS INST EFC (CIV)						
PI-EFC-X114	M529 H12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
	DESCRIPTION: RPV TO PRESS INST EFC (CIV)						
PI-EFC-X115	M529 H12	1 C	SA CK 1 X .5	NA NA NO	GH TS ISP-EFC-B107	RV04	
	DESCRIPTION: RPV TO PRESS INST EFC (CIV)						
PI-EFC-X119	M543-1 B6	2 C	SA CK 1 X .5	NA NA NO	GH FS ISP-EFC-B108		N12 Passive
	DESCRIPTION: WETWELL ATM TO CSP-DPT-6 EFC (CIV)						
PI-V-X42D	M521-1 F5	2 A	MA GB 1	C NA LC	L J TSP-PI/X42D-C801		Passive
	DESCRIPTION: AIR TO RHR-V-50A OPERATOR (INBD CIV)						
PI-V-X54BF	M521-2 H13	2 A	MA GB 1	C NA LC	L J TSP-PI/X54BF-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41B OPERATOR (INBD CIV)						
PI-V-X61F	M521-1 G5	2 A	MA GB 1	C NA LC	L J TSP-PI/X61F-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41A OPERATOR (INBD CIV)						
PI-V-X62F	M521-3 D12	2 A	MA GB 1	C NA LC	L J TSP-PI/X62F-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41C OPERATOR (INBD CIV)						
PI-V-X69C	M521-2 F13	2 A	MA GB 1	C NA LC	L J TSP-PI/X69C-C801		Passive
	DESCRIPTION: AIR TO RHR-V-50B OPERATOR (INBD CIV)						
PI-V-X72F/1 CMP-13	M543-1 F13	2 AC	SA CK 1	C NA NO	HxL J TSP-PI/X72F-R801	ROJ04	
	DESCRIPTION: DRYWELL ATM TO RAD-RE-12A CHK (CIV)						
PI-V-X73E/1 CMP-13	M543-1 F7	2 AC	SA CK 1	C NA NO	HxL J TSP-PI/X73E-R801	ROJ04	
	DESCRIPTION: DRYWELL ATM TO RAD-RE-12B CHK (CIV)						
PI-VX-216	M521-1 G6	2 A	MA GB 1	C NA LC	L J TSP-PI/X42D-C801		Passive
	DESCRIPTION: AIR TO RHR-V-50A OPERATOR (OTBD CIV)						
PI-VX-218	M521-2 H13	2 A	MA GB 1	C NA LC	L J TSP-PI/X54BF-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41B OPERATOR (OTBD CIV)						
PI-VX-219	M521-1 H6	2 A	MA GB 1	C NA LC	L J TSP-PI/X61F-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41A OPERATOR (OTBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-VX-220	M521-3 D11	2 A	MA GB 1	C NA LC	L J TSP-PI/X62F-C801		Passive
	DESCRIPTION: AIR TO RHR-V-41C OPERATOR (OTBD CIV)						
PI-VX-221	M521-2 G12	2 A	MA GB 1	C NA LC	L J TSP-PI/X69C-C801		Passive
	DESCRIPTION: AIR TO RHR-V-50B OPERATOR (OTBD CIV)						
PI-VX-250	M543-1 F13	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X85A/C-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X85A/C-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-251	M543-1 F13	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X85A/C-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X85A/C-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-253	M543-1 F13	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X72F-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X72F-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-256	M543-1 F7	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X29A/C-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X29A/C-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-257	M543-1 F7	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X29A/C-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X29A/C-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-259	M543-1 F7	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-PI/X73E-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-PI/X73E-R801		TV01
	DESCRIPTION: DRYWELL TO RADIATION MONITOR ISO (CIV)						
PI-VX-262	M543-2 G13	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-13 INLET						
PI-VX-263	M543-2 F13	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-13 INLET						
PI-VX-264	M543-2 F13	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-13 INLET						
PI-VX-265	M543-2 B14	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-13 INLET						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PI-VX-266	M543-2 F7	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-14 INLET						
PI-VX-268	M543-2 F7	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-14 INLET						
PI-VX-269	M543-2 B6	2 B	SO SV 1	NA FC NO	G 2Y OSP-CONT/IST-Q703 HJK N OSP-CONT/IST-Q703		N11 Passive
	DESCRIPTION: DRYWELL TO CMS-SR-14 INLET						
PSR-V-003/A	M896 E12	2 B	SO SV 1	C FC NC	G 2Y CSP-PSR/IST-Q701 HJK Q CSP-PSR/IST-Q701		TV01
	DESCRIPTION: RHR LOOP A SAMPLE ISO						
PSR-V-003/B	M896 D12	2 B	SO SV 1	C FC NC	G 2Y CSP-PSR/IST-Q701 HJK Q CSP-PSR/IST-Q701		TV01
	DESCRIPTION: RHR LOOP B SAMPLE ISO						
PSR-V-X73/1	M896 J14	2 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801	RV02	TV01
	DESCRIPTION: DRYWELL ATM SAMPLE ISO (CIV)						
PSR-V-X73/2	M896 J12	2 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801		TV01
	DESCRIPTION: DRYWELL ATM SAMPLE ISO (CIV)						
PSR-V-X77A/1	M896 E14	1 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801	RV02	TV01
	DESCRIPTION: JET PUMP SAMPLE ISO (CIV)						
PSR-V-X77A/2	M896 E12	1 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801		TV01
	DESCRIPTION: JET PUMP SAMPLE ISO (CIV)						
PSR-V-X77A/3	M896 F14	1 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801	RV02	TV01
	DESCRIPTION: JET PUMP SAMPLE ISO (CIV)						
PSR-V-X77A/4	M896 F12	1 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801		TV01
	DESCRIPTION: JET PUMP SAMPLE ISO (CIV)						
PSR-V-X80/1	M896 K14	2 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801	RV02	TV01
	DESCRIPTION: DRYWELL ATM SAMPLE ISO (CIV)						
PSR-V-X80/2	M896 K12	2 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801		TV01
	DESCRIPTION: DRYWELL ATM SAMPLE ISO (CIV)						
PSR-V-X82/1	M896 B12	2 A	SO GB 1	C FC NC	G 2Y TSP-PSR-R801 HJK Q CSP-PSR/IST-Q701 L J TSP-PSR-R801	RV02	TV01
	DESCRIPTION: SAMPLE RETURN TO SUPP POOL ISO (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM			Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
PSR-V-X82/2	M896 B11	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801		TV01
	DESCRIPTION: SAMPLE RETURN TO SUPP POOL ISO (CIV)								
PSR-V-X82/7	M896 G12	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801	RV02	TV01
	DESCRIPTION: SAMPLE RETURN TO DRYWELL ISO (CIV)								
PSR-V-X82/8	M896 G11	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801		TV01
	DESCRIPTION: SAMPLE RETURN TO DRYWELL ISO (CIV)								
PSR-V-X83/1	M896 J13	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801	RV02	TV01
	DESCRIPTION: WETWELL ATM SAMPLE ISO (CIV)								
PSR-V-X83/2	M896 J12	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801		TV01
	DESCRIPTION: WETWELL ATM SAMPLE ISO (CIV)								
PSR-V-X84/1	M896 H12	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801	RV02	TV01
	DESCRIPTION: WETWELL ATM SAMPLE ISO (CIV)								
PSR-V-X84/2	M896 H11	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801		TV01
	DESCRIPTION: WETWELL ATM SAMPLE ISO (CIV)								
PSR-V-X88/1	M896 D13	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801	RV02	TV01
	DESCRIPTION: SUPP POOL SAMPLE ISO (CIV)								
PSR-V-X88/2	M896 D11	2 A	SO GB 1	C FC NC	G HJK L	2Y Q J	TSP-PSR-R801 CSP-PSR/IST-Q701 TSP-PSR-R801		TV01
	DESCRIPTION: SUPP POOL SAMPLE ISO (CIV)								
RCC-RV-34A	M525-2 J7	3 C	SA RV .75 X 1	NA NA NC	P	RV	TSP-RV/IST-R701		TV02
	DESCRIPTION: FPC-HX-1A SHELL SIDE RV								
RCC-RV-34B	M525-2 G7	3 C	SA RV .75 X 1	NA NA NC	P	RV	TSP-RV/IST-R701		TV02
	DESCRIPTION: FPC-HX-1B SHELL SIDE RV								
RCC-V-5	M525-1 E4	2 A	MO GB 10	C FAI NO	G HJ L	2Y RF J	OSP-RCC/IST-R701 OSP-RCC/IST-R701 TSP-RCC/X5-C801	ROJ13	TV01
	DESCRIPTION: RCC TO DRYWELL COOLING LOADS (1ST OTBD CIV)								
RCC-V-21	M525-1 D3	2 A	MO GT 10	C FAI NO	G HJ L	2Y RF J	OSP-RCC/IST-R701 OSP-RCC/IST-R701 TSP-RCC/X46/C801	ROJ13	TV01
	DESCRIPTION: RCC FROM DRYWELL COOLING LOADS (OTBD CIV)								

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RCC-V-40	M525-1 D4	2 A	MO GT 10	C FAI NO	G 2Y OSP-RCC/IST-R701 HJ RF OSP-RCC/IST-R701 L J TSP-RCC/X46/C801	ROJ13	TV01
DESCRIPTION: RCC FROM DRYWELL COOLING LOADS (INBD CIV)							
RCC-V-104	M525-1 E4	2 A	MO GT 10	C FAI NO	G 2Y OSP-RCC/IST-R701 HJ RF OSP-RCC/IST-R701 L J TSP-RCC/X5-C801	ROJ13	TV01
DESCRIPTION: RCC TO DRYWELL COOLING LOADS (2ND OTBD CIV)							
RCC-V-129	M525-2 E6	3 B	MO GT 8	C FAI NO	G 2Y OSP-RCC/IST-Q701 HJ Q OSP-RCC/IST-Q701		TV01
DESCRIPTION: RCC TO FPC-HX-1A & 1B ISO							
RCC-V-130	M525-2 E8	3 B	MO GT 8	C FAI NO	G 2Y OSP-RCC/IST-Q701 HJ Q OSP-RCC/IST-Q701		TV01
DESCRIPTION: RCC FROM FPC-HX-1A & 1B ISO							
RCC-V-131	M525-2 E8	3 B	MO GT 8	C FAI NO	G 2Y OSP-RCC/IST-Q701 HJ Q OSP-RCC/IST-Q701		TV01
DESCRIPTION: RCC FROM FPC-HX-1A & 1B ISO							
RCC-V-133A	M525-2 J6	3 C	SA CK 6	C NA NO	H Q OSP-FPC/IST-Q701		
DESCRIPTION: RCC TO FPC-HX-1A CHK							
RCC-V-133B	M525-2 G6	3 C	SA CK 6	C NA NO	H Q OSP-FPC/IST-Q701		
DESCRIPTION: RCC TO FPC-HX-1B CHK							
RCC-V-219 CMP-04	M525-1 C4	2 AC	SA CK ½	O/C NA NC	Hx 4Y OSP-RCC/IST-R701 HxL J TSP-RCC/X46-C801 Di 10Y	ROJ05	
DESCRIPTION: PRESSURE RELIEF AROUND RCC-V-40 CHK (INBD CIV)							
RCIC-RD-1	M519 D12	2 D	SA RD 10	NA NA NC	W RD MMP-RCIC/IST-F701		
DESCRIPTION: RCIC TURBINE EXHAUST LINE RUPTURE DISC							
RCIC-RD-2	M519 C12	2 D	SA RD 10	NA NA NC	W RD MMP-RCIC/IST-F701		
DESCRIPTION: RCIC TURBINE EXHAUST LINE RUPTURE DISC							
RCIC-RV-3	M519 D13	2 C	SA RV 3/4 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02 N09
DESCRIPTION: RCIC PUMP DISCHARGE THERMAL RELIEF							
RCIC-RV-17	M519 C13	2 C	SA RV 1 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02 N09
DESCRIPTION: RCIC PUMP SUCT THERMAL RELIEF							
RCIC-RV-19T	M519 D9	2 C	SA RV 2 X 3	NA NA NC	P RV TSP-RV/IST-R701		TV02
DESCRIPTION: RCIC-P-1 DISCH TO LO COOLER RV							

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RCIC-V-1	M519 E11	NA B	MO GB 3	C FAI NO	G 2Y OSP-RCIC/IST-Q701 HJ Q OSP-RCIC/IST-Q701		TV01
DESCRIPTION: RCIC TURBINE TRIP/THROTTLE VLV (SUPPLIED AS RCIC-DT-1 SKID)							
RCIC-V-2	M519 E11	NA B	HO GT 3	O FO NT	GH Q OSP-RCIC/IST-Q701		N10
DESCRIPTION: RCIC TURBINE GOVERNOR VLV (SUPPLIED AS RCIC-DT-1 SKID)							
RCIC-V-4	M519 B10	2 B	AO DI 1	C FC NO	HJK Q OSP-RCIC/IST-Q702 G 2Y OSP-RCIC/IST-Q702		N07 TV01
DESCRIPTION: RCIC-P-4 DISCH TO EDR ISO							
RCIC-V-5	M519 B10	2 B	AO DI 1	C FC NC	HJK Q OSP-RCIC/IST-Q702 G 2Y OSP-RCIC/IST-Q702		N07 TV01
DESCRIPTION: RCIC-P-4 DISCH TO EDR ISO							
RCIC-V-8	M519 F6	1 A	MO GT 4	C FAI NO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702 L J TSP-RCIC/X21-C801	CSJ13	TV01 DC MOV
DESCRIPTION: RCIC TURBINE STEAM SUPPLY (OTBD CIV)							
RCIC-V-10	M519 B14	2 B	MO GT 8	C FAI NO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01 DC MOV
DESCRIPTION: CST TO RCIC-P-1 SUCT							
RCIC-V-11	M519 B13	2 C	SA CK 8	O NA NC	H Q OSP-RCIC/IST-Q701		
DESCRIPTION: CST TO RCIC-P-1 SUCT CHK							
RCIC-V-13	M519 H6	1 A	MO GT 6	O/C FAI NC	G 2Y OSP-RCIC/IST-Q703 HJ CS OSP-RCIC/IST-Q703 L 2Y TSP-RCS-R802	CSJ05	TV01 DC MOV
DESCRIPTION: RCIC TO RPV HEAD SPRAY ISO (OTBD CIV)							
RCIC-V-19	M519 F7	2 B	MO GB 2	O/C FAI NC	G 2Y OSP-RCIC/IST-Q701 HJ Q OSP-RCIC/IST-Q701		TV01 N16 DC MOV
DESCRIPTION: RCIC-P-1 MINIMUM FLOW TO SUPP POOL (OTBD CIV)							
RCIC-V-21 CMP-05	M519 F8	2 C	SA CK 2	O NA NC	Hx Q OSP-RCIC/IST-Q701 Nit 8Y OSP-RCIC/IST-Q701		
DESCRIPTION: RCIC-P-1 MINIMUM FLOW TO SUPP POOL CHK							
RCIC-V-22	M519 J8	2 B	MO GB 6	C FAI NC	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01 DC MOV
DESCRIPTION: RCIC-P-1 DISCH TO CST ISO							
RCIC-V-25	M519 E9	2 B	AO DI 1	C FC NO	HJK Q OSP-RCIC/IST-Q702 G 2Y OSP-RCIC/IST-Q702		N07 TV01
DESCRIPTION: RCIC TURBINE STM SUPPLY STM TRAPS TO MAIN COND ISO							
RCIC-V-26	M519 D9	2 B	AO DI 1	C FC NO	HJK Q OSP-RCIC/IST-Q702 G 2Y OSP-RCIC/IST-Q702		N07 TV01
DESCRIPTION: RCIC TURBINE STM SUPPLY STM TRAPS TO MAIN COND ISO							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RCIC-V-28 CMP-06	M519 D8	2 BC	SA CK 1.50	O/C NA NC	Hx Q OSP-RCIC/IST-Q702 Nit 4Y OSP-RCIC/IST-Q702 Di 10Y		N16
	DESCRIPTION: AUX COOLING TO SUPP POOL CHK (CIV)						
RCIC-V-30 CMP-07	M519 C7	2 C	SA CK 8	O NA NC	Hx 2Y OSP-RCIC/IST-B501 Hx Q OSP-RCIC/IST-Q701 Di 8Y	ROJ12	
	DESCRIPTION: SUPP POOL TO RCIC-P-1 SUCT CHK						
RCIC-V-31	M519 C7	2 B	MO GT 8	O/C FAI NC	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702	CSJ14	TV01 N16 DC MOV
	DESCRIPTION: SUPPRESSION POOL TO RCIC-P-1 SUCT (OTBD CIV)						
RCIC-V-40 CMP-08	M519 E8	2 AC	SA CK 10	O/C NA NC	Hx Q OSP-RCIC/IST-Q701 HxL J TSP-RCIC/X4-C801 Nit 8Y OSP-RCIC/IST-Q701		
	DESCRIPTION: RCIC TURBINE EXHAUST TO SUPP POOL CHK (CIV)						
RCIC-V-45	M519 F11	2 B	MO GB 4	O/C FAI NC	G 2Y OSP-RCIC/IST-Q701 HJ Q OSP-RCIC/IST-Q701		TV01 DC MOV
	DESCRIPTION: RCIC TURB STM SUPPLY ISO (MAIN TURBINE TRIP I/L)						
RCIC-V-46	M519 F11	2 B	MO GB 2	O/C FAI NC	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01 DC MOV
	DESCRIPTION: RCIC AUXILIARY COOLING TO LO COOLER ISO						
RCIC-V-47 CMP-09	M519 B10	2 C	SA CK 2	O/C NA NC	Hx Q OSP-RCIC/IST-Q701 Hx 4Y OSP-RCIC/IST-Q702 Nit 4Y OSP-RCIC/IST-Q702		
	DESCRIPTION: RCIC-P-4 (CONDENSATE PUMP) DISCH CHK						
RCIC-V-50	M519 F10	2 B	MO GB 2	C FAI LO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01
	DESCRIPTION: RCIC-HX-2 CW SUPPLY ISO						
RCIC-V-59	M519 J8	2 B	MO GT 6	C FAI NC	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01 DC MOV
	DESCRIPTION: RCIC-P-1 TO CST ISO						
RCIC-V-63	M519 H3	1 A	MO GT 10	C FAI NO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702 L J TSP-RCIC/X21-C801	CSJ13	TV01
	DESCRIPTION: RCIC TURBINE STEAM SUPPLY TO RHR STM-COND (INBD CIV)						
RCIC-V-64	M519 G6	1 A	MO GT 10	C NA LC	L J TSP-RCIC/X21-C801		 Passive
	DESCRIPTION: RCIC TURBINE STEAM SUPPLY TO RHR STM-COND (CIV)						
RCIC-V-65	M519 H6	1 C	SA CK 6	O NA NC	G 2Y OSP-RCIC/IST-R701 H RF OSP-RCIC/IST-R701 Nit 2Y OSP-RCIC/IST-R701	ROJ08	
	DESCRIPTION: RCIC-P-1 DISCH TO RPV HEAD SPRAY CHK						
RCIC-V-66	M519 J4	1 AC	SA CK 6	O/C NA NC	H RF OSP-RCIC/IST-R701 HL RF TSP-RCS-R803	ROJ08	
	DESCRIPTION: RCIC TO RPV HEAD SPRAY CHK (INBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type / Actuat, Valve & Size	Position / Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RCIC-V-68	M519 E7	2 A	MO GT 10	C FAI NO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702 L J TSP-RCIC/X4-C801		TV01 DC MOV
DESCRIPTION: RCIC TURBINE EXHAUST TO SUPP POOL (OTBD CIV)							
RCIC-V-69	M519 D7	2 B	MO GT 1.50	C FAI NO	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702		TV01 N16 DC MOV
DESCRIPTION: RCIC VACUUM PUMP TO SUPP POOL (OTBD CIV)							
RCIC-V-76	M519 H3	1 A	MO GB 1	C FAI NC	G 2Y OSP-RCIC/IST-Q702 HJ Q OSP-RCIC/IST-Q702 L J TSP-RCIC/X21-C801	CSJ13	TV01
DESCRIPTION: RCIC-V-63 BYPASS (INBD CIV)							
RCIC-V-90	M519 H7	2 C	SA CK 6	O/C NA NC	H Q OSP-RCIC/IST-Q701		
DESCRIPTION: RCIC DISCHARGE HEADER CHK							
RCIC-V-110	M519 E7	2 B	MO GT 2	NA FAI NO	G 2Y OSP-RCIC/IST-Q702		Passive
DESCRIPTION: RCIC TURB EXH TO SUPP POOL VAC REL ISO							
RCIC-V-111 CMP-11	M519 E7	2 C	SA CK 2	O/C NA NC	Hx 4Y OSP-RCIC/IST-Q702 Di 10Y		N04
DESCRIPTION: RCIC TURBINE EXHAUST VACUUM BREAKER ISO							
RCIC-V-112 CMP-11	M519 E7	2 C	SA CK 2	O/C NA NC	Hx 4Y OSP-RCIC/IST-Q702 Di 10Y		N04
DESCRIPTION: RCIC TURBINE EXHAUST VACUUM BREAKER ISO							
RCIC-V-113	M519 E7	2 B	MO GT 2	NA FAI NO	G 2Y OSP-RCIC/IST-Q702		Passive
DESCRIPTION: RCIC TURB EXH TO SUPP POOL VAC REL ISO							
RCIC-V-204 CMP-12	M519 B14	2 C	SA CK 8	O/C NA NC	Hx Q OSP-RCIC/IST-Q701 Hx 4Y OSP-RCIC/IST-Q702 Di 8Y		
DESCRIPTION: RCIC PUMP SUCT FROM CST CHK							
RCIC-V-742	M519 J6	1 A	MA GB 0.75	C NA LC	L 2Y TSP-RCS-R802		 Passive
DESCRIPTION: SAMPLE PROBE 19B MAN ISO (CIV)							
REA-V-1	M545-3 H1	3 B	AO BF 72	C FC NO	G 2Y OSP-CONT/IST-Q702 HJK Q OSP-CONT/IST-Q702		TV01
DESCRIPTION: REACTOR BUILDING EXHAUST							
REA-V-2	M545-3 H1	3 B	AO BF 72	C FC NO	G 2Y OSP-CONT/IST-Q702 HJK Q OSP-CONT/IST-Q702		TV01
DESCRIPTION: REACTOR BUILDING EXHAUST							
RFW-V-10A	M529 G12	1 AC	SA CK 24	C NA NO	H RF OSP-RFW/IST-Q701 HL 2Y TSP-RFW/X17A-R801	ROJ06	
DESCRIPTION: RFW TO RPV CHK (INBD CIV)							

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RFW-V-10B	M529 G5	1 AC	SA CK 24	C NA NO	H RF OSP-RFW/IST-Q701 HL 2Y TSP-RFW/X17B-R801	ROJ06	
	DESCRIPTION: RFW TO RPV CHK (INBD CIV)						
RFW-V-32A	M529 G13	1 AC	SA CK 24	C NA NO	H RF OSP-RFW/IST-Q701 HL 2Y TSP-RFW/X17A-R801	ROJ06	
	DESCRIPTION: RFW TO RPV CHK (1ST OTBD CIV)						
RFW-V-32B	M529 G5	1 AC	SA CK 24	C NA NO	H RF OSP-RFW/IST-Q701 HL 2Y TSP-RFW/X17B-R801	ROJ06	
	DESCRIPTION: RFW TO RPV CHK (1ST OTBD CIV)						
RFW-V-65A	M529 G13	1 A	MO GT 24	C FAI NO	G 2Y OSP-RFW/IST-Q701 HJ CS OSP-RFW/IST-Q701 L 2Y TSP-RFW/X17A-R802	CSJ02	TV01
	DESCRIPTION: RFW TO RPV ISO (2ND OTBD CIV)						
RFW-V-65B	M529 G4	1 A	MO GT 24	C FAI NO	G 2Y OSP-RFW/IST-Q701 HJ CS OSP-RFW/IST-Q701 L 2Y TSP-RFW/X17A-R802	CSJ02	TV01
	DESCRIPTION: RFW TO RPV ISO (2ND OTBD CIV)						
RHR-FCV-64A	M521-1 B12	2 B	MO GB 3	O/C FAI NO	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01 N16
	DESCRIPTION: RHR-P-2A MINIMUM FCV (CIV)						
RHR-FCV-64B	M521-2 B5	2 B	MO GB 3	O/C FAI NO	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01 N16
	DESCRIPTION: RHR-P-2B MINIMUM FCV (CIV)						
RHR-FCV-64C	M521-3 E4	2 B	MO GB 3	O/C FAI NO	G 2Y OSP-RHR/IST-Q704 HJ Q OSP-RHR/IST-Q704		TV01 N16
	DESCRIPTION: RHR-P-2C MINIMUM FCV (CIV)						
RHR-RV-1A	M521-1 H13	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02
	DESCRIPTION: RHR-HX-1A SHELL SIDE RV (CIV)						
RHR-RV-1B	M521-2 H5	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02
	DESCRIPTION: RHR-HX-1B SHELL SIDE RV (CIV)						
RHR-RV-5	M521-1 C8	2 AC	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR SHUTDOWN COOLING SUCT THERMAL RELIEF (CIV)						
RHR-RV-25A	M521-1 D10	2 AC	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR LOOP A TEST LINE THERMAL RELIEF (CIV)						
RHR-RV-25B	M521-2 C10	2 AC	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR LOOP B TEST LINE THERMAL RELIEF (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RHR-RV-25C	M521-3 E8	2 AC	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR LOOP C TEST LINE THERMAL RELIEF (CIV)						
RHR-RV-30	M521-2 D8	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR FLUSH LINE THERMAL RELIEF (CIV)						
RHR-RV-88A	M521-1 C7	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR-P-2A SUCT THERMAL RELIEF (CIV)						
RHR-RV-88B	M521-2 B9	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR-P-2B SUCT THERMAL RELIEF (CIV)						
RHR-RV-88C	M521-3 D8	2 AC	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701 L J TSP-CONT-C801		TV02 N09
	DESCRIPTION: RHR-P-2C SUCT RV (CIV)						
RHR-V-3A	M521-1 H10	2 B	MO GT 18	O/C FAI NO	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01
	DESCRIPTION: RHR-HX-1A OUTLET ISO						
RHR-V-3B	M521-2 J9	2 B	MO GT 18	O/C FAI NO	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01
	DESCRIPTION: RHR-HX-1B OUTLET ISO						
RHR-V-4A	M521-1 C7	2 B	MO GT 24	O/C FAI NO	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01 N16
	DESCRIPTION: SUPPRESSION POOL TO RHR-P-2A SUCT (OTBD CIV)						
RHR-V-4B	M521-2 B11	2 B	MO GT 24	O/C FAI NO	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01 N16
	DESCRIPTION: SUPPRESSION POOL TO RHR-P-2B SUCT (OTBD CIV)						
RHR-V-4C	M521-3 B11	2 B	MO GT 24	O/C FAI NO	G 2Y OSP-RHR/IST-Q704 HJ Q OSP-RHR/IST-Q704		TV01 N16
	DESCRIPTION: SUPPRESSION POOL TO RHR-P-2C SUCT (OTBD CIV)						
RHR-V-6A	M521-1 B8	2 B	MO GT 18	O/C FAI NC	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01
	DESCRIPTION: RPV TO RHR-P-2A SUCT (SDC MODE)						
RHR-V-6B	M521-1 B7	2 B	MO GT 18	O/C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01
	DESCRIPTION: RPV TO RHR-P-2B SUCT (SDC MODE)						
RHR-V-8	M521-1 E6	1 A	MO GT 20	O/C FAI NC	G 2Y OSP-RHR/IST-R704 HJ RF OSP-RHR/IST-R704 L 2Y TSP-RCS-R802	ROJ10	TV01 DC MOV
	DESCRIPTION: RHR SDC MODE SUPPLY FOR A & B FROM RPV (OTBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RHR-V-9	M521-1 D5	1 A	MO GT 20	O/C FAI NC	G 2Y OSP-RHR/IST-R704 HJ RF OSP-RHR/IST-R704 L 2Y TSP-RCS-R802	ROJ10	TV01
	DESCRIPTION: RHR SDC MODE SUPPLY FOR A & B FROM RPV (INBD CIV)						
RHR-V-16A	M521-1 H7	2 A	MO GT 16	O/C FAI NC	G 2Y OSP-RHR/IST-Q705 HJ CS OSP-RHR/IST-Q705 L J TSP-RHR/X11A-C801	CSJ11	TV01
	DESCRIPTION: RHR TO DRYWELL SPRAY HEADER (2ND OTBD CIV)						
RHR-V-16B	M521-2 D11	2 A	MO GT 16	O/C FAI NC	G 2Y OSP-RHR/IST-Q706 HJ CS OSP-RHR/IST-Q706 L J TSP-RHR/X11B-C801	CSJ11	TV01
	DESCRIPTION: RHR TO DRYWELL SPRAY HEADER (2ND OTBD CIV)						
RHR-V-17A	M521-1 H6	2 A	MO GT 16	O/C FAI NC	G 2Y OSP-RHR/IST-Q705 HJ CS OSP-RHR/IST-Q705 L J TSP-RHR/X11A-C801	CSJ11	TV01
	DESCRIPTION: RHR TO DRYWELL SPRAY HEADER (1ST OTBD CIV)						
RHR-V-17B	M521-2 D11	2 A	MO GT 16	O/C FAI NC	G 2Y OSP-RHR/IST-Q706 HJ CS OSP-RHR/IST-Q706 L J TSP-RHR/X11B-C801	CSJ11	TV01
	DESCRIPTION: RHR TO DRYWELL SPRAY HEADER (1ST OTBD CIV)						
RHR-V-21	M521-3 E7	2 B	MO GB 18	C FAI NC	G 2Y OSP-RHR/IST-Q704 HJ Q OSP-RHR/IST-Q704		TV01 N16
	DESCRIPTION: RHR LOOP C TEST LINE TO SUPP POOL (OTBD CIV)						
RHR-V-23	M521-2 K13	1 A	MO GB 6	C FAI NC	G 2Y OSP-RHR/IST-Q706 HJ CS OSP-RHR/IST-Q706 L 2Y TSP-RCS-R802	CSJ01	TV01 DC MOV
	DESCRIPTION: RHR TO RCIC RPV HEAD SPRAY (OTBD CIV)						
RHR-V-24A	M521-1 E9	2 B	MO GB 18	O/C FAI NC	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01 N16
	DESCRIPTION: RHR LOOP A TEST LINE TO SUPP POOL (OTBD CIV)						
RHR-V-24B	M521-2 C11	2 B	MO GB 18	O/C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01 N16
	DESCRIPTION: RHR LOOP B TEST LINE TO SUPP POOL (OTBD CIV)						
RHR-V-27A	M521-1 D7	2 A	MO GT 6	O/C FAI NC	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702 L J TSP-RHR/X25A-C801		TV01
	DESCRIPTION: RHR TO SUPPRESSION CHAMBER SPRAY HEADER (OTBD CIV)						
RHR-V-27B	M521-2 C10	2 A	MO GT 6	O/C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703 L J TSP-RHR/X25B-C801		TV01
	DESCRIPTION: RHR TO SUPPRESSION CHAMBER SPRAY HEADER (OTBD CIV)						
RHR-V-31A	M521-1 C14	2 C	SA CK 18	O/C NA NC	H Q OSP-RHR/IST-Q702		
	DESCRIPTION: RHR-P-2A DISCH CHK						
RHR-V-31B	M521-2 C3	2 C	SA CK 18	O/C NA NC	H Q OSP-RHR/IST-Q703		
	DESCRIPTION: RHR-P-2B DISCH CHK						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RHR-V-31C	M521-3 C3	2 C	SA CK 18	O/C NA NC	H Q OSP-RHR/IST-Q704		
	DESCRIPTION: RHR-P-2C DISCH CHK						
RHR-V-40	M521-2 G4	2 B	MO GB 4	C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01 DC MOV
	DESCRIPTION: RHR LOOP B TO EDR (SDC WARMUP LINE) ISO						
RHR-V-41A	M521-1 G5	1 AC	SA CK 14	O/C NA NC	H RF OSP-RHR/IST-R701 HL RF TSP-RCS-R801	ROJ08	
	DESCRIPTION: RHR A LPCI TO RPV CHK (INBD CIV)						
RHR-V-41B	M521-2 G13	1 AC	SA CK 14	O/C NA NC	H RF OSP-RHR/IST-R702 HL RF TSP-RCS-R802	ROJ08	
	DESCRIPTION: RHR B LPCI TO RPV (INBD CIV)						
RHR-V-41C	M521-3 E13	1 AC	SA CK 14	O/C NA NC	H RF OSP-RHR/IST-R703 HL RF TSP-RCS-R802	ROJ08	
	DESCRIPTION: RHR C LPCI TO RPV (INBD CIV)						
RHR-V-42A	M521-1 G7	1 A	MO GT 14	O/C FAI NC	G 2Y OSP-RHR/IST-Q705 HJ CS OSP-RHR/IST-Q705 L 2Y TSP-RCS-R801	CSJ06	TV01
	DESCRIPTION: RHR A LPCI MODE TO RPV (OTBD CIV)						
RHR-V-42B	M521-2 G12	1 A	MO GT 14	O/C FAI NC	G 2Y OSP-RHR/IST-Q706 HJ CS OSP-RHR/IST-Q706 L 2Y TSP-RCS-R802	CSJ06	TV01
	DESCRIPTION: RHR B LPCI MODE TO RPV (OTBD CIV)						
RHR-V-42C	M521-3 E11	1 A	MO GT 14	O/C FAI NC	G 2Y OSP-RHR/IST-Q707 HJ CS OSP-RHR/IST-Q707 L 2Y TSP-RCS-R802	CSJ06	TV01
	DESCRIPTION: RHR B LPCI MODE TO RPV (OTBD CIV)						
RHR-V-48A	M521-1 J11	2 B	MO GB 18	O/C FAI NO	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01
	DESCRIPTION: RHR-HX-1A BYPASS						
RHR-V-48B	M521-2 K8	2 B	MO GB 18	O/C FAI NO	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01
	DESCRIPTION: RHR-HX-1B BYPASS						
RHR-V-49	M521-2 G4	2 B	MO GT 4	C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01
	DESCRIPTION: RHR LOOP B TO EDR (SDC WARMUP LINE) ISO						
RHR-V-50A	M521-1 E5	1 AC	SA CK 12	O/C NA NC	H RF OSP-RHR/IST-R701 HL RF TSP-RCS-R801	ROJ08	
	DESCRIPTION: RHR A SDC TO RPV CHK (INBD CIV)						
RHR-V-50B	M521-2 F13	1 AC	SA CK 12	O/C NA NC	H RF OSP-RHR/IST-R702 HL RF TSP-RCS-R802	ROJ08	
	DESCRIPTION: RHR B SDC TO RPV (INBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type: Actuat, Valve & Size	Position: Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RHR-V-53A	M521-1 E6	1 A	MO GT 12	O/C FAI NC	G 2Y OSP-RHR/IST-Q705 HJ CS OSP-RHR/IST-Q705 L 2Y TSP-RCS-R801	CSJ01	TV01
	DESCRIPTION: RHR A SDC MODE TO RPV (OTBD CIV)						
RHR-V-53B	M521-2 F11	1 A	MO GT 12	O/C FAI NC	G 2Y OSP-RHR/IST-Q706 HJ CS OSP-RHR/IST-Q706 L 2Y TSP-RCS-R802	CSJ01	TV01
	DESCRIPTION: RHR B SDC MODE TO RPV (OTBD CIV)						
RHR-V-68A	M524-1 E14	3 B	MO GT 16	O FAI NO	G 2Y OSP-SW/IST-Q701 HJ Q OSP-SW/IST-Q701		TV01
	DESCRIPTION: SW FROM RHR-HX-1A ISO						
RHR-V-68B	M524-2 G14	3 B	MO GT 16	O FAI NO	G 2Y OSP-SW/IST-Q702 HJ Q OSP-SW/IST-Q702		TV01
	DESCRIPTION: SW B FROM RHR-HX-1B ISO						
RHR-V-73A	M521-1 H14	2 B	MO GB 2	C FAI NC	G 2Y OSP-RHR/IST-Q702 HJ Q OSP-RHR/IST-Q702		TV01 N16
	DESCRIPTION: RHR-HX-1A SHELL SIDE VENT (OTBD CIV)						
RHR-V-73B	M521-2 H4	2 B	MO GB 2	C FAI NC	G 2Y OSP-RHR/IST-Q703 HJ Q OSP-RHR/IST-Q703		TV01 N16
	DESCRIPTION: RHR-HX-1B SHELL SIDE VENT (OTBD CIV)						
RHR-V-84A CMP-22	M521-1 D15	2 C	SA CK 1.50	C NA NC	Hx Q OSP-RHR/IST-Q702 Hx 12M OSP-RHR-A701		N01
	DESCRIPTION: LPCS-P-2 (WATER LEG) TO RHR A CHK						
RHR-V-84B CMP-22	M521-2 B4	2 C	SA CK 1.50	C NA NC	Hx Q OSP-RHR/IST-Q703 Hx 12M OSP-RHR-A702		N01
	DESCRIPTION: RHR-P-3 (WATER LEG) DISCH TO RHR B CHK						
RHR-V-84C CMP-22	M521-3 C5	2 C	SA CK 1.50	C NA NC	Hx Q OSP-RHR/IST-Q704 Hx 12M OSP-RHR-A704		N01
	DESCRIPTION: RHR-P-3 (WATER LEG) DISCH TO RHR C CHK						
RHR-V-85A CMP-22	M521-1 D14	2 C	SA SC 1.50	C NA NC	Hx Q OSP-RHR/IST-Q702 Hx 12M OSP-RHR-A701		N01
	DESCRIPTION: LPCS-P-2 (WATER LEG) TO RHR A STOP CHK						
RHR-V-85B CMP-22	M521-2 B3	2 C	SA SC 1.50	C NA NC	Hx Q OSP-RHR/IST-Q703 Hx 12M OSP-RHR-A702		N01
	DESCRIPTION: RHR-P-3 (WATER LEG) DISCH TO RHR B STOP CHK						
RHR-V-85C CMP-22	M521-3 C4	2 C	SA SC 1.50	C NA NC	Hx Q OSP-RHR/IST-Q704 Hx 12M OSP-RHR-A704		N01
	DESCRIPTION: RHR-P-3 (WATER LEG) DISCH TO RHR C STOP CHK						
RHR-V-123A	M521-1 E5	1 A	MO GT 1	C FAI NC	G 2Y OSP-RHR/IST-R704 HJ RF OSP-RHR/IST-R704 L 2Y TSP-RCS-R801	ROJ11	TV01
	DESCRIPTION: RHR-V-50A BYPASS (INBD CIV) (MOTOR DEENERGIZED)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RHR-V-123B	M521-2 E13	1 A	MO GT 1	C FAI NC	G 2Y OSP-RHR/IST-R704 HJ RF OSP-RHR/IST-R704 L 2Y TSP-RCS-R802	ROJ11	TV01
	DESCRIPTION: RHR-V-50B BYPASS (INBD CIV) (MOTOR DEENERGIZED)						
RHR-V-209	M521-1 D5	1 AC	SA CK 0.75	O/C NA NC	H RF OSP-RHR/IST-R701 HL 2Y TSP-RCS-R802	ROJ03	N04
	DESCRIPTION: THERMAL RELIEF CHK BETWEEN RHR-V-8 AND 9 (CIV)						
RHR-V-503 CMP-10	M521-1 A8	2 C	SA CK 0.50	C NA NC	Hx 4Y OSP-RHR/IST-Q702 Di 10Y		
	DESCRIPTION: RHR-V-6A LEAK BY-PASS CHK						
RHR-V-731	M521-1 H11	1 B	MA GB 0.75	C NA NC	H 2Y OSP-RHR/IST-Q702		
	DESCRIPTION: RHR A SAMPLE PROBE 22A ISO						
RHR-V-732	M521-1 H8	1 B	MA GB 0.75	C NA NC	H 2Y OSP-RHR/IST-Q703		
	DESCRIPTION: RHR B SAMPLE PROBE 22B ISO						
ROA-V-1	M545-3 D1	3 B	AO BF 84	C FC NO	G 2Y OSP-CONT/IST-Q702 HJK Q OSP-CONT/IST-Q702		TV01
	DESCRIPTION: REACTOR BUILDING ISO						
ROA-V-2	M545-3 D2	3 B	AO BF 84	C FC NO	G 2Y OSP-CONT/IST-Q702 HJK Q OSP-CONT/IST-Q702		TV01
	DESCRIPTION: REACTOR BUILDING ISO						
RRC-V-13A CMP-15	M530-1 C13	2 AC	SA CK 0.75	C NA NO	Hx 4Y OSP-RRC/IST-R701 HxL J TSP-RRC/X43A-C801 Nit 8Y OSP-RRC/IST-R701	ROJ14	
	DESCRIPTION: RRC PUMP SEAL PURGE INLET CHK (INBD CIV)						
RRC-V-13B CMP-15	M530-1 B13	2 AC	SA CK 0.75	C NA NO	Hx 4Y OSP-RRC/IST-R701 HxL J TSP-RRC/X43B-C801 Nit 8Y OSP-RRC/IST-R701	ROJ14	
	DESCRIPTION: RRC PUMP SEAL PURGE INLET CHK (INBD CIV)						
RRC-V-16A	M530-1 C14	2 A	MO GT 0.75	C FAI NO	G 2Y OSP-RRC/IST-R701 HJ RF OSP-RRC/IST-R701 L J TSP-RRC/X43A-C801	ROJ14	TV01
	DESCRIPTION: RRC PUMP SEAL PURGE INLET (OTBD CIV)						
RRC-V-16B	M530-1 B14	2 A	MO GT 0.75	C FAI NO	G 2Y OSP-RRC/IST-R701 HJ RF OSP-RRC/IST-R701 L J TSP-RRC/X43B-C801	ROJ14	TV01
	DESCRIPTION: RRC PUMP SEAL PURGE INLET (OTBD CIV)						
RRC-V-19	M530-1 F11	1 A	SO GB 1	C FC NO	G 2Y OSP-RRC/IST-Q701 HJK Q OSP-RRC/IST-Q701 L J TSP-RRC/X77AA-C801		TV01
	DESCRIPTION: RRC SAMPLE PROBE 1 ISO (CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
RRC-V-20	M530-1 F12	1 A	SO GB 1	C FC NO	G 2Y OSP-RRC/IST-Q701 HJK Q OSP-RRC/IST-Q701 L J TSP-RRC/X77AA-C801		TV01
	DESCRIPTION: RRC SAMPLE PROBE 1 ISO (CIV)						
RWCU-V-1	M523-1 F14	1 A	MO GT 6	C FAI NO	G 2Y OSP-RWCU/IST-Q701 HJ CS OSP-RWCU/IST-Q701 L J TSP-RWCU/X14-C801	CSJ07	TV01
	DESCRIPTION: RWCU FROM RPV ISO (INBD CIV)						
RWCU-V-4	M523-1 E15	1 A	MO GT 6	C FAI NO	G 2Y OSP-RWCU/IST-Q701 HJ CS OSP-RWCU/IST-Q701 L J TSP-RWCU/X14-C801	CSJ07	TV01 DC MOV
	DESCRIPTION: RWCU FROM RPV ISO (OTBD CIV)						
RWCU-V-40	M523-1 H10	1 A	MO GT 6	C FAI NO	G 2Y OSP-RWCU/IST-Q701 HJ CS OSP-RWCU/IST-Q701 L 2Y TSP-RFW/X17A-R802	CSJ07	TV01
	DESCRIPTION: RWCU TO RFW ISO (OTBD CIV)						
SA-V-109	M510-3 H8	2 A	MA GB 2	C NA LC	L J TSP-SA/X93-C801		Passive
	DESCRIPTION: AIR LINE ISO USED FOR MAINT (CAPPED IN DW) (CIV)						
SGT-V-1A	M544 G14	2 B	MO BF 18	C FAI NC	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT INLET						
SGT-V-1B	M544 E14	2 B	MO BF 18	C FAI NC	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT INLET						
SGT-V-2A	M544 H14	3 B	AO BF 18	O FO NO	G 2Y OSP-SGT/IST-Q701 HJK Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FU-1A INLET						
SGT-V-2B	M544 D14	3 B	AO BF 18	O FO NO	G 2Y OSP-SGT/IST-Q702 HJK Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FU-1B INLET						
SGT-V-3A1	M544 G7	2 B	MO BF 18	O FAI NO	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A2 INLET						
SGT-V-3A2	M544 J7	2 B	MO BF 18	O/C FAI NO	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A1 INLET						
SGT-V-3B1	M544 E7	2 B	MO BF 18	O/C FAI NO	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B2 INLET						
SGT-V-3B2	M544 C7	2 B	MO BF 18	O FAI NO	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B1 INLET						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
SGT-V-4A1	M544 J5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A1 EXHAUST TO RX BLDG						
SGT-V-4A2	M544 G5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A2 EXHAUST TO RX BLDG						
SGT-V-4B1	M544 C5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B1 EXHAUST TO RX BLDG						
SGT-V-4B2	M544 D5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B2 EXHAUST TO RX BLDG						
SGT-V-5A1	M544 J5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A1 EXHAUST TO STACK						
SGT-V-5A2	M544 G5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q701 HJ Q OSP-SGT/IST-Q701		TV01
	DESCRIPTION: SGT-FN-1A2 EXHAUST TO STACK						
SGT-V-5B1	M544 C5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B1 EXHAUST TO STACK						
SGT-V-5B2	M544 E5	2 B	MO BF 18	O/C FAI NC	G 2Y OSP-SGT/IST-Q702 HJ Q OSP-SGT/IST-Q702		TV01
	DESCRIPTION: SGT-FN-1B2 EXHAUST TO STACK						
SLC-RV-29A	M522 F6	2 C	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: SLC-P-1A DISCH RV						
SLC-RV-29B	M522 D6	2 C	SA RV 1 X 2	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: SLC-P-1B DISCH RV						
SLC-V-1A	M522 E4	2 B	MO GB 4	O FAI NC	G 2Y OSP-SLC/IST-Q701 HJ Q OSP-SLC/IST-Q701		TV01
	DESCRIPTION: SLC-TK-1A (STORAGE TANK) TO SLC-P-1A SUCT ISO						
SLC-V-1B	M522 D4	2 B	MO GB 4	O FAI NC	G 2Y OSP-SLC/IST-Q701 HJ Q OSP-SLC/IST-Q701		TV01
	DESCRIPTION: SLC-TK-1B (STORAGE TANK) TO SLC-P-1B SUCT ISO						
SLC-V-4A	M522 F8	1 AD	SO EX 1.50	O/C NA NC	L J TSP-SLC/X13-R801 V EX OSP-SLC-B701		
	DESCRIPTION: SLC-P-1A DISCH TO RPV ISO (EXPLOSIVE OTBD CIV)						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
SLC-V-4B	M522 D8	1 AD	SO EX 1.50	O/C NA NC	L J TSP-SLC/X13-R801 V EX OSP-SLC-B702		
	DESCRIPTION: SLC-P-1B DISCH TO RPV ISO (EXPLOSIVE OTBD CIV)						
SLC-V-6 CMP-25	M522 F11	1 C	SA CK 1.50	O/C NA NC	Hx RF OSP-SLC-B701, B702 Nit 4Y OSP-SLC-B701, B702	ROJ01	
	DESCRIPTION: SLC TO RPV CHK						
SLC-V-7 CMP-25	M522 H13	1 AC	SA CK 1.50	O/C NA NC	Hx RF OSP-SLC-B701, B702 HxL J TSP-SLC/X13-R801 Nit 4Y OSP-SLC-B701, B702	ROJ01	
	DESCRIPTION: SLC TO RPV CHK (INBD CIV)						
SLC-V-33A CMP-16	M522 F7	2 C	SA CK 1.50	O/C NA NC	Hx Q OSP-SLC/IST-Q701 Nit 4Y OSP-SLC/IST-Q701		
	DESCRIPTION: SLC-P-1A DISCH CHK						
SLC-V-33B CMP-16	M522 D7	2 C	SA CK 1.50	O/C NA NC	Hx Q OSP-SLC/IST-Q701 Nit 4Y OSP-SLC/IST-Q701		
	DESCRIPTION: SLC-P-1B DISCH CHK						
SW-RV-001A	M524-1 D14	3 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: RHR-HX-1A TUBE SIDE RV						
SW-RV-001B	M524-2 F14	3 C	SA RV .75 X 1	NA NA NC	P RV TSP-RV/IST-R701		TV02
	DESCRIPTION: RHR-HX-1B TUBE SIDE RV						
SW-TCV-11A	M775 G5	3 B	HO GB 2.50	O FO NT	HK Q ESP-SW/IST-Q701		N17
	DESCRIPTION: EMERGENCY CHILLED WATER FROM WMA-CC-51A-1 TCV						
SW-TCV-11B	M775 C5	3 B	HO GB 2.50	O FO NT	HK Q ESP-SW/IST-Q702		N17
	DESCRIPTION: EMERGENCY CHILLED WATER FROM WMA-CC-51B-1 TCV						
SW-V-1A CMP-24	M524-1 H5	3 C	SA CK 20	O NA NC	Hx Q OSP-SW/IST-Q701 Nit 4Y OSP-SW/IST-Q701 Di 10Y		
	DESCRIPTION: SW-P-1A DISCH CHK						
SW-V-1B CMP-24	M524-2 F5	3 C	SA CK 20	O NA NC	Hx Q OSP-SW/IST-Q702 Nit 4Y OSP-SW/IST-Q702 Di 10Y		
	DESCRIPTION: SW-P-1B DISCH CHK						
SW-V-2A	M524-1 H6	3 B	MO BF 20	O/C FAI NC	G 2Y OSP-SW/IST-Q701 HJ Q OSP-SW/IST-Q701		TV01
	DESCRIPTION: SW-P-1A DISCH ISO						
SW-V-2B	M524-2 F6	3 B	MO BF 20	O/C FAI NC	G 2Y OSP-SW/IST-Q702 HJ Q OSP-SW/IST-Q702		TV01
	DESCRIPTION: SW-P-1B DISCH ISO						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
SW-V-12A	M524-1 G3	3 B	MO GT 18	O/C FAI NC	G 2Y OSP-SW/IST-Q701 HJ Q OSP-SW/IST-Q701		TV01
	DESCRIPTION: SW A RETURN TO SPRAY POND B ISO						
SW-V-12B	M524-2 G3	3 B	MO GT 18	O/C FAI NC	G 2Y OSP-SW/IST-Q702 HJ Q OSP-SW/IST-Q702		TV01
	DESCRIPTION: SW B RETURN TO SPRAY POND A ISO						
SW-V-29	M524-1 G6	3 B	MO BF 8	O/C FAI NC	G 2Y OSP-SW/IST-Q703 HJ Q OSP-SW/IST-Q703		TV01
	DESCRIPTION: HPCS-P-2 DISCH ISO						
SW-V-69A	M524-1 G3	3 B	MA GT 18	O/C NA LC	H 2Y OSP-SW/IST-Q701		
	DESCRIPTION: SW TO COOLING TOWER CROSSTIE ISO (OPERATED VIA MOV HANDWHEEL)						
SW-V-69B	M524-2 F2	3 B	MA GT 18	O/C NA LC	H 2Y OSP-SW/IST-Q702		
	DESCRIPTION: SW TO COOLING TOWER CROSSTIE ISO (OPERATED VIA MOV HANDWHEEL)						
SW-V-70A	M524-1 G2	3 B	MA GT 18	O/C NA LC	H 2Y OSP-SW/IST-Q701		
	DESCRIPTION: SW TO COOLING TOWER CROSSTIE ISO (OPERATED VIA MOV HANDWHEEL)						
SW-V-70B	M524-2 F2	3 B	MA GT 18	O/C NA LC	H 2Y OSP-SW/IST-Q702		
	DESCRIPTION: SW TO COOLING TOWER CROSSTIE ISO (OPERATED VIA MOV HANDWHEEL)						
SW-V-75A	M524-1 B12	3 B	MO GB 2	O/C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW TIE TO FPC LOOP A						
SW-V-75AA	M524-1 B13	3 B	MA GB 2	O/C NA NC	H 2Y OSP-FPC/IST-Q701		
	DESCRIPTION: SW CROSSTIE TO FPC MAN ISO						
SW-V-75B	M524-2 A14	3 B	MO GB 2	O/C FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW TIE TO FPC LOOP B						
SW-V-75BB	M524-2 B14	3 B	MA GB 2	O/C NA NC	H 2Y OSP-FPC/IST-Q701		
	DESCRIPTION: SW CROSSTIE TO FPC MAN ISO						
SW-V-165A	M524-1 E3	3 B	MA BF 18	O/C NA NO	H 2Y OSP-SW/IST-Q701		
	DESCRIPTION: SW A RETURN TO SPRAY POND B SPRAY RING HDR BYPASS						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
SW-V-165B	M524-2 K3	3 B	MA BF 18	O/C NA NO	H 2Y OSP-SW/IST-Q702		
	DESCRIPTION: SW B RETURN TO SPRAY POND A SPRAY RING HDR BYPASS						
SW-V-170A	M524-1 E3	3 B	MA BF 18	O/C NA NC	H 2Y OSP-SW/IST-Q701		
	DESCRIPTION: SW A RETURN TO SPRAY POND B SPRAY RING HDR MAN ISO						
SW-V-170B	M524-2 K3	3 B	MA BF 18	O/C NA NC	H 2Y OSP-SW/IST-Q702		
	DESCRIPTION: SW B RETURN TO SPRAY POND A SPRAY RING HDR MAN ISO						
SW-V-187A	M524-1 H14	3 B	MO GT 6	O FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW TO FPC-HX-1A INLET						
SW-V-187B	M524-2 C13	3 B	MO GT 6	O FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW TO FPC-HX-1B INLET						
SW-V-188A	M524-1 J13	3 B	MO GT 6	O FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW FROM FPC-HX-1A OUTLET						
SW-V-188B	M524-2 D12	3 B	MO GT 6	O FAI NC	G 2Y OSP-FPC/IST-Q701 HJ Q OSP-FPC/IST-Q701		TV01
	DESCRIPTION: SW FROM FPC-HX-1B OUTLET						
SW-V-226A	M775 F7	3 C	SA CK 3	C NA NC	H Q OSP-CCH/IST-M701		
	DESCRIPTION: CCH-EV-1A (EVAPORATOR) OUTLET CHK						
SW-V-226B	M775 B6	3 C	SA CK 3	C NA NC	H Q OSP-CCH/IST-M702		
	DESCRIPTION: CCH-EV-1B (EVAPORATOR) OUTLET CHK						
SW-V-227A	M775 H7	3 B	MA GT 3	C NA NC	H 2Y OSP-CCH/IST-M701		
	DESCRIPTION: CCH-P-1A SUCT MAN ISO						
SW-V-227B	M775 C7	3 B	MA GT 3	C NA NO	H 2Y OSP-CCH/IST-M702		
	DESCRIPTION: CCH-P-1B SUCT MAN ISO						
SW-V-822A	M775 J5	3 B	MA GT 3	O NA NO	H 2Y OSP-CCH/IST-M701		
	DESCRIPTION: SW TO WMA-CC-51A-1 (CR CHILLER) MAN ISO						

Valve EPN	Dwg & Coord	Class & Cat	Type Actuat, Valve & Size	Position Safety, Failed, Normal	Tests, Frequency & PPM	Testing Exceptions (CSJ/ROJ/ Reliefs)	Remarks (Notes & Technical Position)
SW-V-822B	M775 E5	3 B	MA GT 3	O NA NC	H 2Y OSP-CCH/IST-M702		
DESCRIPTION: SW TO WMA-CC-51B-1 (CR CHILLER) MAN ISO							
SW-V-823A	M775 J5	3 B	MA GT 3	O NA NO	H 2Y OSP-CCH/IST-M701		
DESCRIPTION: SW FROM WMA-CC-51A-1 (CONTROL RM CHILLER) MAN ISO							
SW-V-823B	M775 E5	3 B	MA GT 3	O NA NC	H 2Y OSP-CCH/IST-M702		
DESCRIPTION: SW FROM WMA-CC-51B-1 (CONTROL RM CHILLER) MAN ISO							
TIP-V-1	M604 G13	2 A	SO BA 0.375	C FC NC	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27-R801		TV01
DESCRIPTION: TIP LINE BALL-TYPE ISO VLV (1ST OTBD CIV)							
TIP-V-2	M604 G13	2 A	SO BA 0.375	C FC NC	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27-R801		TV01
DESCRIPTION: TIP LINE BALL-TYPE ISO VLV (1ST OTBD CIV)							
TIP-V-3	M604 G12	2 A	SO BA 0.375	C FC NC	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27-R801		TV01
DESCRIPTION: TIP LINE BALL-TYPE ISO VLV (1ST OTBD CIV)							
TIP-V-4	M604 H12	2 A	SO BA 0.375	C FC NC	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27-R801		TV01
DESCRIPTION: TIP LINE BALL-TYPE ISO VLV (1ST OTBD CIV)							
TIP-V-5	M604 H12	2 A	SO BA 0.375	C FC NC	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27-R801		TV01
DESCRIPTION: TIP LINE BALL-TYPE ISO VLV (1ST OTBD CIV)							
TIP-V-6 CMP-26	M604 F12	2 AC	SA CK 0.375	C NA NO	Hx 4Y OSP-TIP/IST-R701 HxL J TSP-TIP/X27F-R801 Di 10Y	ROJ04	
DESCRIPTION: TIP PURGE LINE CHK (INBD CIV)							
TIP-V-15	M604 G13	2 A	SO SV 1	C FC NO	G 2Y OSP-CONT/IST-Q703 G 2Y TSP-TIP/X27F-R801 HJK Q OSP-CONT/IST-Q703 L J TSP-TIP/X27F-R801		TV01
DESCRIPTION: TIP PURGE LINE CHK (OTBD CIV)							

5.4 Inservice Testing Program Notes

The following additional information/methodologies are provided as NOTES to the Valve Inservice Testing Program. The NOTE numbers correspond to the notes listed throughout the valve test tables.

<u>NOTE N01</u>

Per Subsection **<u>ISTC-5223 Series Valves in Pairs</u>**, if two check valves are in series configuration without provisions to verify individual reverse flow closure (e.g., keepfill pressurization valves) and the plant safety analysis assumes closure of either valve (but not both), the valve pair may be operationally tested closed as a unit. If the plant safety analysis assumes that a specific valve or both valves of the pair close to perform the safety function(s), the required valve(s) shall be tested to demonstrate individual valve closure.

Per Subsection **<u>ISTC-5224 Corrective Action</u>**, Series valve pairs tested as a unit in accordance with ISTC-5223 that fail to prevent reverse flow shall be declared inoperable, and both valves shall be either repaired or replaced.

The following series check valve pairs are being tested in accordance with ISTC-5223 and ISTC-5224 requirements as stated above. A review of the License Basis Documents indicates that these valves are not credited individually for any safety related function. Therefore, one valve could be removed without requiring NRC approval. The safety related function for these check valves is to close, which prevents bypass flow from the applicable ECCS pump and maintains the ECCS injection flow path integrity. As long as one of the check valves in the series pair is capable of closure, then the intended design function for the check valves is met.

The operability of these valves in the open direction (non safety function) is demonstrated continuously during normal power operation. Failure to open would become apparent by the decay of system pressure to a point where a Control Room Annunciator would turn on, indicating low system pressure.

Each pair of series check valves is exercise tested during the quarterly surveillance by some positive means (measurement or observation of an operational parameter such as pressure or flow) to verify the closure capability of at least one of the valves to prevent reverse flow and open capability of both valves. Acceptance criteria to verify closure of each pair of check valves is provided in the implementing surveillance procedures. If closure capability of the pair of valves is questionable, both valves shall be declared inoperable and both valves shall be repaired or replaced as necessary before the return to service.

LPCS-V-33, 34
HPCS-V-6, 7
RHR-V-84A, 85A
RHR-V-84B, 85B
RHR-V-84C, 85C

NOTE N02

These valves are testable check valves and the valve actuator was designed to assist in exercising the valve. It is not intended for use in normal system operations and is therefore, exempt from ISTC-5131(a) (stroke-time measurement) and ISTC-3560 (operation of fail-safe actuators) requirements.

CSP-V-7, 8, 10
CVB-V-1AB, CD, EF, GH, JK, LM, NP, QR, ST

NOTE N03

These valves are operated by a programmer with an index wheel. The programmer is activated by logic which trips on low header pressure or on header isolation combined with low header pressure. The programmer rotates one position to de-energize a solenoid and open a nitrogen bottle isolation valve. If the low pressure condition persists, in 30 seconds, the programmer rotates and another solenoid is de-energized to open another nitrogen bottle isolation valve. The index wheel is equipped with a window through which a number 1 through 20 may be seen. Each number corresponds to the number of solenoids de-energized in its rotational sequence which corresponds directly with the number of valves that are open.

It is the Owner's position that this is not a "Valve Position Indicator" as used in ISTC-3700. At best it is an indicator of whether or not specific solenoids should be energized or not.

CIA-SPV-1A through 15A
CIA-SPV-1B through 19B

NOTE N04

The following check valves, used to limit pressure, are not capacity certified and are classified as check valves, tested per Subsection ISTC. Per Note 4 of Table ISTC-3500-1 they are outside the scope of OM Code Mandatory Appendix I test requirements.

FPC-V-157A and FPC-V-157B
RCIC-V-111 and RCIC-V-112
RHR-V-209

NOTE N05

The following CRD valves (typical of 185 valves) perform a function important to safety. These valves are non-ASME and as such are not required to be included in the IST program by 10 CFR 50.55a. These valves are being tested per Columbia Generating Station Technical Specifications or FSAR applicable to each valve. This alternate testing complies with the test guidance provided in NUREG 1482 Revision 2 Section 4.4.6. No relief request is required.

Valve	Category	Function	Tested Per Technical Specifications or FSAR
CRD-V-114	C	Scram Discharge Header Check Valve	SR 3.1.4.1 SR 3.1.4.2
CRD-V-115	C	Charging Water Check Valve	FSAR 4.6.1
CRD-V-126	B	Scram Inlet AOV	SR 3.1.4.1 SR 3.1.4.2
CRD-V-127	B	Scram Outlet AOV	SR 3.1.4.1 SR 3.1.4.2
CRD-V-138	C	Cooling Water Check Valve	SR 3.1.3.2

NOTE N06

The following emergency diesel generator air start system valves perform a function important to safety. These valves are non-ASME and as such are not required to meet the testing requirements of OM Code Subsection ISTC. These valves are tested during DG Air Starter Motor Testing as part of post maintenance testing and prior to return to service.

Valve

DSA-SPV-5A1/2

DSA-SPV-5A1/4

DSA-SPV-5A2/2

DSA-SPV-5A2/4

DSA-SPV-5B1/2

DSA-SPV-5B1/4

DSA-SPV-5B2/2

DSA-SPV-5B2/4

DSA-SPV-5C1/1

DSA-SPV-5C1/2

NOTE N07

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-4	2	B	RCIC-P-4 Discharge to EDR Isolation	Reactor Core Isolation Cooling
RCIC-V-5	2	B	RCIC-P-4 Discharge to EDR Isolation	Reactor Core Isolation Cooling
RCIC-V-25	2	B	RCIC Turbine Steam Supply Steam Traps to Main Condenser Isolation	Reactor Core Isolation Cooling
RCIC-V-26	2	B	RCIC Turbine Steam Supply Steam Traps to Main Condenser Isolation	Reactor Core Isolation Cooling

The close function to close off equipment drain path during RCIC system operation can be accomplished by either valve RCIC-V-4 or RCIC-V-5 (CCERs C97-0139, Rev 0 and CCER C97-0010, Rev 1). Similarly the close function to close off the steam drip pot drain path during RCIC system operation can be accomplished by either valve RCIC-V-25 or RCIC-V-26 (CCER C92-0128, Rev 3). However all four valves are being maintained with an active function of close to increase reliability of the RCIC system to meet its design requirements. Failure of one of the valves in each pair to meet its acceptance criteria specified in the surveillance procedure OSP-RCIC/IST-Q702 will not affect RCIC system operability.

NOTE N08

Per ISTC-1200, Category B safety and relief valves are excluded from the requirements of ISTC-3700, Valve Position Verification and ISTC-3500, Valve Testing Requirements.

NOTE N09

These relief valves have been installed for thermal relief application. Their only overpressure protection function is to protect the applicable ECCS system from fluid expansion caused by changes in fluid temperature. Per calculation 5.19.15, these valves are installed for thermal relief, i.e. requiring flows of 1 gpm or less.

HPCS-RV-14, HPCS-RV-35
LPCS-RV-18, LPCS-RV-31
RCIC-RV-3, RCIC-RV-17
RHR-RV-5, RHR-RV-25A/B/C, RHR-RV-30, RHR-RV-88A/B/C

NOTE N10

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-2	2	B	RCIC Turbine Governor Valve	Reactor Core Isolation Cooling

This valve is skid mounted and regulates steam flow to the RCIC Turbine. Proper operation of the valve is verified during quarterly pump test per surveillance procedure OSP-RCIC/IST-Q701.

NOTE N11

Per CCER C94-0242 these valves are normally open and receive no automatic signal. The valves can be closed in response to a Design Basis Instrument Line Break Accident, which is not considered to be a credible accident coincident with a LOCA, but the closure of these valves for an instrument line break is not a containment isolation function, but rather a system function. The hydrogen/oxygen monitoring system supported by these valves is designed as an extension of the primary containment boundary and these valves are not considered containment isolation valves. As these valves perform no active safety function they are classified as "B passive". Only test requirements for these valves per OM Code Subsection ISTC are 2 year VPI. Valves will be stroke timed at the Owner's discretion.

PI-VX-262, PI-VX-263, PI-VX-264, PI-VX-265, PI-VX-266, PI-VX-268 and PI-VX-269.

NOTE N12

These containment atmosphere and suppression pool instrument line EFCVs have been deleted from the Technical Specifications testing requirements and are now tested per FSAR Section 6.2.4.4 (Reference: Technical Specification SR 3.6.1.3.8 Amendment #170, GI2-01-017, February 20, 2001.) These valves have no active safety function and are included in the IST program at Owner's discretion and will be periodically tested per FSAR Section 6.2.4.4.

NOTE N13

CAC system has been permanently isolated and deactivated per PDC 4533 and PDC 3539.

NOTE N14

MSLC system has been deactivated per EC 97-0045-1C. The breakers have been opened and the control fuses removed. The containment isolation valves (3A thru 3D) have been chained and locked closed. Their safety function has been changed to passive to maintain primary containment integrity. Excess flow check valves, PI-EFC-X18A through PI-EFC-X18D has been deactivated per EC 97-0045-3E.

NOTE N15

Affected Valves	Class	Cat.	Function	System(s)
DO-V-1A	3	C	DO-P-1A Discharge Check	Diesel Fuel Oil Transfer
DO-V-1B	3	C	DO-P-1B Discharge Check	Diesel Fuel Oil Transfer
DO-V-10	3	C	DO-P-2 Discharge Check	Diesel Fuel Oil Transfer

These valves are classified as skid mounted valves per ASME OM Code 2004 Edition through 2006 addenda, Section ISTA-2000. They are adequately tested as a part of the diesel generator system and are exempt from the testing requirements of subsection ISTC per ISTC-1200(c). See Technical Position TP02 for additional information. These valves are also verified open and close every quarter to provide assurance of their continued operability as specified in NUREG-1482, Revision 2 section 4.1.10.

NOTE N16

Primary Containment Valve no longer requires leak rate testing per Appendix J program since it is not an airborne pathway and is in closed system outside of the Primary Containment. See LDCN LCS-08-027 and LDCN FSAR-08-028 for additional information.

NOTE N17

Affected Valves	Class	Cat.	Function	System(s)
SW-TCV-11A, B	3	B	Throttle flow to control temperature of the Control Room	Standby Service Water

These hydraulically actuated valves serve as regulating thermostatic control valves. The valves do not function to rapidly isolate or de-isolate the piping into which they are installed. Rather, their function is to slowly regulate throughout their entire stroke range to control the outlet temperatures of the components they serve. SW-TCV-11A & 11B are controlled by thermostats which regulate main control room air temperature. These valves are not provided with position indication. Manual control of these valves can only be obtained by lifting the 4-20 mA control leads to inject a test signal to the hydraulic actuator. This in turn requires that the Technical Specification 3.7.4 and Licensee Controlled Specification 1.7.2 required systems be taken out of service.

These power-operated control valves that only have a fail-safe function (fail open), were exempt from the code requirements for valve stroke-time measurement testing, the associated stroke-time acceptance criteria, and any corrective actions that will result from stroke-time testing need not be met per code case OMN-8. The use of this code case was approved per relief request RV02 for the third 10 year interval. ASME OMb 2006 addenda revised section ISTC-5100 to include the exemption of code case OMN-8 for power-operated control valves.

These valves shall be exercised quarterly in accordance with the other Subsection ISTC requirements and the fail-safe position on a loss of power (OPEN) shall be verified. Any abnormality or erratic action experienced during valve exercising shall be evaluated per the Corrective Action Program.

5.5 Records and Reports of Valves

Records and reports pertaining to valves in the Program will be maintained in accordance with OM Subsection ISTC-9000. The files will contain the following:

1. Valve records will be maintained in accordance with Paragraph ISTC-9100.

2. Inservice test plans include valve surveillance test procedures. The inservice testing records for valves in the Program will be maintained in accordance with Paragraph ISTC-9200.

3. Records of tests for valves in the Program will be maintained in accordance with Paragraph ISTC-9120. Completed surveillance test procedures are retained per Plant administrative procedures.

4. Records of corrective actions for valves in the Program will be maintained in accordance with Paragraph ISTC-9130. Corrective actions are documented on WOs and/or CRs.

Records and reports pertaining to pressure relief devices in the Program will also be maintained in accordance with OM Code Mandatory Appendix I, Paragraph I-5000 requirements.

The Valve Inservice Test Program, associated surveillance test procedures and results, and corrective actions are retained per Plant Administrative Procedures.

SAMPLE VALVE STROKE DATA SHEET

VALVE EPN	# OPENING TIME IN SECONDS					# CLOSING TIME IN SECONDS				
	Ref. Value	Alert Lo (+1)(+2)	Measured Value	Alert Hi (+1)(+2)	Action Hi (+1)(+2)	Ref. Value	Alert Lo (+1)(+2)	Measured Value	Alert Hi (+1)(+2)	Action Hi (+1)(+2)
RHR-V-4A †	111	94		128	144	109	93		125	142
RHR-V-6A †	102	87		117	133	100	85		115	130
RHR-V-3A †	106	90		122	138	105	89		121	137
RHR-V-48A †	86	73		99	112	85	72		98	111
RHR-FCV-64A †	13	11		15	17 (+5)	13	11		15	17 (+5)
RHR-V-27A †	29	25		33	38	29	25		33	36 $ (+3)
RHR-V-84A/85A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	Not Closed (+4)
RHR-V-31A	N/A	N/A		N/A	Not Open	N/A	N/A		N/A	Not Closed
RHR-V-24A †	88	75		101	114	86	73		99	112 (+6)
RHR-V-60A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	2
RHR-V-75A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	2
RHR-V-73A †	10 (+7)	N/A		N/A	N/A	10	8		13	15
RHR-V-503	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	Not Closed

\# (+1) For measured values beyond the Alert Value or Action Value refer to Precaution and Limitations 4.5 or 4.6, respectively.

(+2) When comparing measured values to Alert and Action limits round all measured Stroke Times to the nearest second. Use standard rounding techniques, e.g., 10.49 rounds to 10 and 10.5 rounds to 11 seconds.

(+3) Limiting stroke time per LCS.

\# (+4) If the valves are found not closed, repair or replace both valves RHR-V-84A and RHR-V-85A.

(+5) Use listed stroke time as limiting even though a higher limit is specified in RHR system design specification data sheet, CVI 02E12-03,6

(+6) Use listed stroke time as limiting even though a higher limit is specified in Licensee Control Specifications.

(+7) Measure until motion stops (GT 95%) as indicated on RHR-POI-608A.

† Motor operated valve

SAMPLE TWO YEAR VALVE POSITION INDICATION (VPI) VERIFICATION AND CHANNEL CALIBRATION DATA SHEET

		# Verified Open				# Verified Closed					
	Valve Condition Inspected	Local Indication		Remote Indication		Remote Indication		Local Indication		Valve Operation	
		Initial	As Found	Sat	Unsat	Sat	Unsat	Initial	As Found		
Valve No.	7.3.1	7.3.2	7.3.3	7.3.4	7.3.4	7.3.4	7.3.4	7.3.2	7.3.3	7.3.5	7.3.7
RHR-V-4A #(+1)											
RHR-V-6A											
RHR-V-3A											
RHR-V-48A											
RHR-FCV-64A #(+1)											
RHR-V-27A #(+1)											
RHR-V-24A #(+1)											
RHR-V-73A #(+1)											

(+1) These valves require channel calibration in addition to two year VPI. VPI verification satisfies both requirements.

5.6 Technical Positions

Technical Position – **TV01**

Title

Limiting Values of Full-stroke Times for Power Operated Valves

Issue Discussion

OM Code subsection ISTC requires that an initial reference value be established for each valve or group of valves. The acceptance criteria is a percentage ± of the reference value. Subsection ISTC recognizes that operating characteristics of electric motor operated valves are more consistent than those of other power operated valves.

Subsection ISTC specifies stroke time acceptance criteria in Paragraphs ISTC-5122, ISTC-5132, ISTC-5142 and ISTC-5152. The limiting values of stroke time testing are to be established by the Owner according to Paragraphs ISTC-5121, ISTC-5131, ISTC-5141 and ISTC-5151.

Position

The following criteria shall be used to establish Acceptance Criteria and Limiting Value ranges for power operated valves:

Type	Acceptance Criteria (Alert)	Limiting Value (Action)
MOVs ≤ 10 seconds	± .25 T_{ref}*	1.50 T_{ref}**
MOVs > 10 seconds	± .15 T_{ref}	1.30 T_{ref}
SOVs/AOVs/HOVs ≤ 10 seconds	± .50 T_{ref}	2.00 T_{ref}
SOVs/AOVs/HOVs > 10 seconds	± .25 T_{ref}	1.50 T_{ref}

* or ± a 1.0 second change in stroke time, whichever is greater when compared to the Reference value

** or ± a 1.0 second change in stroke time, whichever is greater when compared to the Alert Hi value

Technical Position – **TV01** (Contd.)

NOTES:

1. Tref is the reference or average stroke value in seconds for a valve.

2. Measured stroke times are rounded to the nearest second when comparing measured values to Acceptance Criteria and Limiting value. Standard rounding techniques are used when rounding measured stroke times during valve stroke timing (e.g., 10.49 rounds to 10 and 10.5 is rounded to 11 seconds).

3. When establishing new reference values by taking the average of previous values, use measured values without rounding off. The new reference values will then be rounded off to the nearest second.

4. The Acceptance Criteria and the Limiting Value will be rounded off to the nearest second.

5. When reference stroke values can be significantly influenced by other related conditions, then these conditions shall be analyzed.

6. If the above calculated values exceed a TS (Technical Specification), FSAR value or other design basis limit, then the TS, FSAR or design basis value must be used for the limiting value of full-stroke.

7. Valves with stroke times of less than 2 seconds are exempt from the above acceptance criteria, if the maximum limiting valve stroke time is set at 2 seconds (ISTC-5122(c), ISTC-5132(c), ISTC-5142(c) and ISTC-5152(c)).

8. Standard rounding techniques will be used when rounding off readings during stroke timing (e.g., 2.49 seconds rounds to 2 and 2.5 rounds to 3 seconds). Specific valves with normal stroke times less than 2 seconds will be identified as "Fast-Acting Valves" and will be considered acceptable if the measured stroke time (rounded to the nearest second) remains at 2 seconds or less. Corrective action will be required when a "Fast-Acting Valve" rounded stroke time is 3 seconds or greater.

9. Per OM Code (ISTC-5121(c), ISTC-5131(c), ISTC-5141(c) and ISTC-5151(c)), stroke times shall be measured to at least the nearest second. Thus rounding technique for measurements and reference values meets the Code requirements.

10. When valve stroke time measuring techniques other than stop watches provide more precise measurements, rounding technique will not be used.

Technical Position – **TV02**

Title

Inservice Performance Testing of Pressure Relief Devices

Issue Discussion

Subsection ISTC-5240 requires testing of safety and relief devices in accordance with Mandatory Appendix I. The devices subject to this testing and/or replacements are those included in the Valve Test Tables.

Position

The following clarifications will be used when implementing testing requirements for safety and relief devices.

1. Acceptance criteria (I-1310(e)) are specified in Relief Valve Set Point Data Sheets for each specific valve.

2. Replacement valves (I-2000): Valves meeting the required testing acceptance criteria of Mandatory Appendix I may be used as replacements.

3. Thermal relief replacement valves (I-1390): New valves not previously used at Columbia Generating Station or previously used valves which have been refurbished and satisfactorily tested.

4. Spare Class 1 Main Steam relief valves, which have been set-pressure tested after repair and refurbishment prior to new 10 year interval implementation dates, in accordance with the Code in effect for third 10-year interval, may not be retested prior to installation in the Plant provided they were tested LT 5 years before installation. These valves will be considered operable based on this previous test. Next test for these valves shall occur before 5 years from the previous test.

5. Testing of valve accessories is not dependent on operating conditions and will be performed at normal ambient condition (Paragraph I-1120(a)).

6. Each installed Class 1 pressure relief valve shall be as-found tested at least once every 5 years. The test interval for any installed valve shall not exceed 5 years. The test interval is defined from test to test date. When as-found test requirements have been satisfied for a given 24-month or 5-year test interval, additional valves removed for maintenance do not require as-found set-pressure testing prior to disassembly for maintenance. IST engineer should be consulted before deleting any as-found set-pressure testing. See relief request RG01 for applicable grace period for test frequency.

Technical Position – **TV02** (Contd.)

7. Each installed Class 2 or Class 3 pressure relief valve shall be as-found tested at least once every 10 years. The test interval for any installed valve shall not exceed 10 years. The test interval is defined from test to test date. When as-found test requirements have been satisfied for a given 48-month or 10-year test interval, additional valves removed for maintenance do not require as-found set-pressure testing prior to disassembly for maintenance. IST engineer should be consulted before deleting any as-foundd set-pressure testing. See relief request RG01 for applicable grace period for test frequency.

8. Pressure relief devices, meeting the requirements of Mandatory Appendix I by replacement, shall be replaced in the interval specified by Appendix I. The service period is from installation to removal from service. This clarification applies to Class 2 and Class 3 rupture discs (I-1360) and Class 2 and Class 3 thermal relief valves (I-1390).

9. Visual inspection prior to installation is met during the refurbishment process or by QC receipt inspection for new valves.

Technical Position – **TV03**

Title

Inservice Testing of Vacuum Relief Valves, suppression chamber-to-drywell vacuum breakers (CVB Valves)

Issue Discussion

Per OM Code Subsection ISTC-5230, vacuum breakers shall meet the applicable inservice test requirements of ISTC-5220 and Mandatory Appendix I.

OM Code, Mandatory Appendix I, Paragraph I-3370 specifies the following testing requirements for Class 2 and 3 vacuum relief valves:

(a) The valves shall be actuated to verify open and close capability, set pressure, and performance of any pressure and position sensing accessories.

(b) Compliance with the Owner's seat tightness criteria shall be determined.

Per Paragraph I-1380, all Class 2 and 3 vacuum relief valves shall be tested every 2 years, unless performance data suggests the need for a more appropriate test interval.

Position

At Columbia Generating Station these vacuum relief valves are operability tested in accordance with Technical Specification 3.6.1.7. Technical Specification testing detailed below meets or exceeds the testing requirements of ISTC-5220 and Mandatory Appendix I. As such these valves will continue to be tested in accordance with the Columbia Generating Station Technical Specifications. Leakage testing of these valves is performed in accordance with Technical Specifications SR 3.6.1.1.2, SR 3.6.1.1.3, and SR 3.6.1.1.4 (Relief Request RV01). These testing requirements will also apply to replacement and refurbished valves, as applicable.

SURVEILLANCE REQUIREMENTS:

1. SR 3.6.1.7.1, verify each vacuum breaker is closed every 14 days.

2. SR 3.6.1.7.2, perform a functional test of each required vacuum breaker every 31 days and within 12 hours after any discharge of steam to the suppression chamber from the safety/relief valves.

3. SR 3.6.1.7.3, verify the full open setpoint of each required vacuum breaker is less than or equal to 0.5 psid every 24 months.

Position indicators are verified operable during the performance of above surveillances.

Technical Position – **TV04**

Title: Preconditioning of Structures, Systems and Components

System: Various

Components: Pumps and Valves within the IST Program Plan

Code Class: Various

Background:

Primary goal of the IST Program is to monitor components for degradation so that timely action can be taken to correct deficiencies that may develop which could prevent the components from performing their safety function(s). IST Program test activities are intended to identify problems by collecting relevant data on a periodic basis, evaluating the component's performance based on test results, and trending performance over time. Ideally, IST tests are conducted in such a manner that a component's ability to perform is not altered by one or more preconditioning events (intentionally or unintentionally) which occur over a given time period before the test. In this way, the component's condition is somewhat "random" as it may be called upon to perform its function.

Some level of preconditioning is unavoidable (e.g. a normally closed valve must be first opened before it can be timed closed). Additionally, some level of random preconditioning is acceptable. IST data is not always so precise that it would be corrupted by an occasional, slightly biased data due to preconditioning.

There may be justification for not performing as-found IST prior to maintenance, such as, those instances where maintenance would result in a significant improvement in component performance. Results of tests run prior to performance of such maintenance will no longer present the operating characteristics of the repaired components, and pre-maintenance test data would be of limited value in predicting the future performance of the component. However, this position should only be taken if the component past results indicate that the component is not vulnerable to fail prior to the performance of the work.

The practicality of performing an as-found test should be assessed by comparing the benefit and burden involved. Where the burden of performing the as-found test clearly outweighs the benefit that me be gained, an as-found test may be eliminated upon evaluation. Benefits associated with the as-found tests vary with the vulnerability of the test to preconditioning activities, and the value of the test data in predicting future component performance.

ASME Code Guidance:

The ASME OM Code does not specifically require licensees to test components in the as-found condition (except for safety and relief valves and periodic diagnostic testing of motor-operated valves). However degradation mechanisms might not be identified unless as-found testing is performed. Where the ASME Code does not specify provisions for as-found testing of a pump or a valve, the licensee is responsible for determining whether an activity constitutes acceptable or unacceptable preconditioning of a pump or valve tested under the IST program.

Technical Position – **TV04** (Contd.)

Regulatory Guidance:

This technical position is based upon guidance contained in NUREG-1482, Revision 2, Section 3.5 "Pre-Conditioning of Pumps and Valves", NRC Inspection Manual Part 9900 Technical Guidance, "Maintenance – Preconditioning of Structures, Systems, and Components Before Determining Operability," Inservice Testing Owners Group "Position on IST Component Preconditioning, Revision 1, dated February 28, 2011".

Definitions:

Preconditioning of SSCs
The alteration, variation, manipulation, or adjustment of the physical condition of an SSC before Technical Specification surveillance or ASME Code testing.

Unacceptable Preconditioning
Any activity performed prior to or during an inservice test which alters one or more of the measured parameters such that it results in acceptable test results. This could include activities such as cycling, cleaning, lubricating, agitating, or other specific activities performed prior to or during an inservice test that could mask component degradation. The impact may depend on the design of the component. For example, stem lubrication has essentially no impact on an MOV; however, may influence the test result of an AOV.

Acceptable Preconditioning
Any activity which has the potential to affect the ability to detect a degrading performance trend but for which factors are involved that would justify the preconditioning; or, an activity performed prior to IST that has no potential to mask component degradation. This could include activities such as cycling, cleaning, lubricating, agitating, or other specific activities performed prior to or during an inservice test that would not mask component degradation. A documented evaluation of the non-adverse impact upon the component's as-found condition should be performed in advance of the preconditioning activity.

As Found Testing:
Testing performed on a component in their "as-found" state (e.g. the components have not undergone preconditioning of a nature deemed unacceptable).

Position:

Technical Specification Surveillances and/or ASME OM Code Inservice Testing (IST) will be performed in the as found condition to the extent practical and that only acceptable preconditioning will be performed. Technical decisions that result in or involve conditions of maintenance that prevent preconditioning, such as timing/sequence of activities, will be documented on the controlling work control document (i.e., WORK ORDER or procedure). The following guidance is provided for evaluating and documenting preconditioning activities.

Technical Position – **TV04** (Contd.)

Quarterly (or more frequent) IST

Care should be taken to ensure that procedures, surveillances, or tasks are not scheduled such that "unacceptable" preconditioning of a component prior to the IST occurs. Where unacceptable preconditioning would occur, the procedure/task should specify that an as-found test be performed. No as-found test is required prior to corrective maintenance for components which are tested quarterly as long as the test history trends indicate that the component is not vulnerable to failure prior to the performance of the work.

Infrequently Performed IST (cold shutdown or refueling frequency)

Cold Shutdown and Refueling outage surveillances, to the extent practical, should be performed prior to any event which may unacceptably precondition the SSC.

Timing of Maintenance and IST

As long as a routine maintenance activity is performed at an interval approximately four times longer than the applicable IST test the performance of that maintenance before the IST may be evaluated to determine that it is acceptable preconditioning. The principle underlying this guidance is that multiple as-found tests between routine maintenance activities provide satisfactory opportunity to identify any degradation. It is extremely improbable that a component may have suffered rapid degradation immediately prior to the maintenance activity and that such routine maintenance restores the performance to normal. In order for it to be acceptable preconditioning, it should be determined that there has been no evidence of a degrading trend with potential for exceeding acceptance criteria prior to that maintenance activity.

Where it can be shown that an activity to be performed either has no effect on the testing results, or can detect component degradation better than the IST (e.g., certain preventive and corrective maintenance activities), or where the maintenance is so extensive that it will result in an essentially new component (i.e., one having new operating characteristics), then an evaluation may be made that the timing of the IST is inconsequential.

Evaluation of Unacceptable Preconditioning

It is recognized that certain events (e.g., an emergency shutdown, errors in initial test performance, discovery of required maintenance in a mode where the as-found test cannot be performed, etc.) may result in preconditioning prior to IST. This would not represent a violation of IST Technical Specification requirements since preconditioning is not an explicit Code requirement, however it may be considered a violation under 10CFR50 Appendix B.

When preconditioning questions or concerns arise, such events should be evaluated to determine if unacceptable preconditioning has occurred by evaluating the following questions:

- Does the practice performed ensure that the pump or valve will meet its testing acceptance criteria?
- Would the pump or valve have failed the test without the preconditioning?
- Does the practice bypass or mask the as-found condition of the pump or valve?
- Is preventive maintenance routinely performed on the pump or valve just before testing?

Technical Position – **TV04** (Contd.)

- Is preventive maintenance on the pump or valve performed only for scheduling convenience?

If preventive maintenance (PM) is being performed at an interval much greater than the IST exam interval, it may be evaluated to be acceptable to perform the PM prior to the IST test as was previously discussed. The intent of preventive maintenance is not to restore a component to an

operable status and with multiple IST tests performed between the PM events any degradation will already have been identified and trended.

If unacceptable preconditioning has occurred and conditions no longer support conduct of an as-found test until the maintenance activity is completed, the event should be captured in the corrective action program to evaluate the impact and take any additional remedial actions that may be necessary; such as additional tests, results of the inspection, condition of replaced parts, etc..

Examples of Acceptable Preconditioning

Some of the following examples may not describe scenarios involving Inservice Testing. These examples are included with the intent to help in understanding the concepts of acceptable and unacceptable preconditioning.

1. The minimal manipulation of a system to allow for control or isolation of components for surveillance testing or maintenance such as:
   - Operating components for a normal system operation or test configuration
   - Cycling breakers to allow removal from service and restoration
   - Racking breakers in or out and installing on a test stand
   - Installing jumpers or hydraulic/pneumatic connections
2. Pressurizing/Depressurizing to setup for required tests and leak checking.
3. Recovery activities to regain operable status for an SSC in an LCO.
4. A preventive maintenance activity that instead of sending a component off-site for a regular calibration, replaces it with one that has already been tested and calibrated.
5. A surveillance test that follows preventive maintenance is acceptable preconditioning if the test is performed approximately 4 times more frequent than the PM, e.g., a quarterly test that follows an annual PM.
6. A surveillance test that follows corrective maintenance or preventive maintenance is acceptable preconditioning if the component's test results would indicate that it was not vulnerable to fail prior to the work.
7. Venting a system prior to running the system for a pump performance test provided that the venting operation has proper controls. Venting does not enhance pump performance but does prevent transients on the system. Abnormal gas quantity identified in such venting would need to be evaluated in the corrective action program and may have system operability impact.
8. Lubricating AC MOV valve stems prior to stroke time testing has been evaluated to be insignificant with regard to detecting degradation. AC MOV motors draw more or less current as running loads change but motor rotational speed remains essentially constant and therefore stroke time is unaffected. Technical basis document that supports this conclusion should be developed.
9. Wetting valve seat/disc prior to stroking to meet manufacturer's recommendations and to simulate accident conditions. (e.g. MSIVs tested with steam present)

Technical Position – **TV04** (Contd.)

10. Cycling breakers in consecutive sections of a procedure.
11. Manually cycling a new switch prior to installation to remove any possible "set" in the contacts or mechanism.
12. Multiple components being affected by data collection on other instruments.
13. A transmitter is removed from service, test equipment installed, and the transmitter and test equipment vented to remove air introduced during test equipment installation.
14. Instrument & Control PM's that check instrument loop control, alarm, or indication functions downstream of an isolator, prior to an upstream device calibration or tests.
15. Performance of operational procedures which produce full or partial flow through check valves prior to leak rate testing per ISTC-3600. This is acceptable preconditioning if it is part of normal, established system operational procedures, lineups, etc.
16. Stroking or stroke time testing of MOVs / AOVs prior to leak rate testing per ISTC-3600, as long as the final closure of the valve utilizes normal, remote actuation.
17. Venting of permanent plant indicators prior to use for IST data recording is acceptable if such venting is per established procedural guidance and the intent of the venting is solely to ensure accurate indications. Note that the ASME Code actually requires that an indicator be vented if the presence of air may influence the indication.
18. 18 Operational procedures to flush systems at the start of refueling outages to reduce dose levels prior to inservice testing.
19. Operational procedures that require periodic operation of components to ensure availability due to circumstances beyond the control of the facility; such as cold weather operations or hurricane preparations.
20. For AC MOVs:
    - It is acceptable to stroke the valve as many times as necessary for operational reasons prior to performing a timed stroke for IST.
    - It is acceptable to perform a packing torque adjustment up to the controlled torque value prior to any IST exam.
    - It is acceptable to lubricate the stem prior to stroke timing.
21. For power-operated valves with as found stroke times outside IST (acceptable range) limits but within the Limiting Value of Full Stroke Time (Owner Specified Limits), it is acceptable to immediately re-stroke and time the valve in accordance with the guidance in ASME OM Code Section ISTC-5115(b), 5123(b) or 5133(b). The purpose of the re-stroke is not to satisfy operability criteria and analysis of the as found stroke time measurement.

<u>Examples of Unacceptable Preconditioning</u>

1. Scheduling or performance of consecutive tests if one test preconditions the other. Such tests should be scheduled as far apart as the intervals allow.
2. The scheduling of maintenance work activities immediately prior to the performance of Technical Specification surveillances with the intent of ensuring favorable test results (i.e., activities are known to influence a test outcome).
3. Removing electrical loads prior to breaker load surveillance testing.
4. Manually cycling a breaker prior to testing when it is known that cycling results in influencing test outcome.

Technical Position – **TV04** (Contd.)

5. Exercising an Air Operated Valve (AOV) immediately prior to a surveillance test on the valve. For AOVs which stroke automatically as a result of system manipulations during the surveillance testing, the stroke time test should be performed during the first stroke of the valve. Normal system operations conducted during the periods between surveillance tests may cause such valves to cycle and this would not be considered unacceptable preconditioning.
6. Lubrication of an AOV valve stem prior to inservice testing with the intent to improve test performance. Lubrication of such a valve during a longer interval preventive maintenance activity at some point between surveillance tests would not typically be considered unacceptable preconditioning.
7. Performing multiple strokes of multiple valves operated from a single switch to obtain individual stroke times when a means exists to obtain the stroke times simultaneously. In the absence of such means, measuring as found stroke times of different valves in a staggered manner to obtain true as-found results as frequently as possible for each valve would be acceptable.
8. Routine electrical grooming such as tightening connectors, burnishing contacts, etc., just before or during testing. (When done as a regular schedule PM for the purpose of maintaining the system in its optimum condition and not performed before every test, then it would be acceptable.)
9. Filling floor/equipment drain loop seals just prior to testing a ventilation systems capability to maintain pressure conditions in a given space.
10. Adjustment of flow to the lowest possible value during inservice testing of a marginal pump in order to obtain acceptable DP measurement.
11. Procedures that contain instructions requiring inspection, cleaning, and lubrication of breakers before performing surveillance testing of the breaker functions.
12. Procedures or work order task instructions that contain steps requiring component manipulation or unnecessary enhancement to the as-found conditions before performing surveillance testing.

References:

1. ASME OM Code for Operation and Maintenance of Nuclear Power Plants.
2. NUREG-1482, Revision 2, Guidelines for Inservice Testing at Nuclear Power Plants, Final Report, Published October 2013.
3. NRC Inspection Manual Part 9900 Technical Guidance, “Maintenance – Preconditioning of Structures, Systems, and Components Before Determining Operability.”
4. USNRC Information Notice, IN 97-16, Preconditioning of Plant Structures, Systems, and Components Before ASME Code Inservice Testing or Technical Specification Surveillance Testing.
5. Inservice Testing Owners’ Group Position on Preconditioning, Rev 1, dated February 28, 2011.

5.7 Cold Shutdown Justifications

ISTC-3510 states that all Active category A, category B, and category C check valves shall be tested nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222.

ISTC-3521 states that category A and B valves shall be full-stroke tested or exercised during operation at power to the position(s) required to fulfill its function(s). If full-stroke exercising during operation at power is not practicable, it may be limited to part-stroke during operation at power and full-stroke during cold shutdowns. Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in ISTC-3521(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months. During extended shutdowns, valves that are required to perform their intended function shall be exercised every 3 months, if practicable.

ISTC-3522 states that category C check valves shall be exercised during operation at power in a manner that verifies obturator travel by using the methods in ISTC-5221. If exercising is not practicable during operation at power, it shall be performed during cold shutdowns. Valves exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in ISTC-3522(e). Such exercise is not required if the interval since the previous exercise is less than 3 months. During extended shutdowns, valves that are required to perform their intended function shall be exercised every 3 months, if practicable.

Valve exercising during cold shutdown shall commence within 48 hours of achieving cold shutdown and continue until all testing is complete or the plant is ready to return to operation at power. For extended outages, testing need not be commenced in 48 hour provided all valves required to be tested during cold shutdown will be tested before or as part of plant startup. However, it is not the intent of the Code to keep the plant in cold shutdown to complete cold shutdown testing.

All valves tested during cold shutdown outages shall also be tested before startup from refueling outages, unless testing has been completed within the previous 3 months. If an outage lasts beyond 3 months, all cold shutdown testing shall be completed within the last 3 months of the shutdown.

Cold shutdown valves are tested in groups by several different procedures. NUREG-1482, Revision 2 Section 3.1.1.1 suggests performing sequential testing of these cold shutdown surveillances. Approximately one third of the cold shutdown surveillances should be performed during any cold shutdown outage of sufficient duration. The valves tested in a preceding cold shutdown should be the last valves tested during the next cold shutdown during a refuel cycle.

The following valves are identified as being impracticable to exercise during plant operations and will therefore be exercised during cold shutdowns. All of these valves will be tested during each refueling outage. The valves are identified by unique valve numbers and Code identification as to Code Class and Valve Category.

Cold Shutdown Justification – **CSJ01**

Description

It is not practicable to full or partial stroke exercise open the following RHR valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RHR-V-23	1	A	RHR supply to vessel head spray	Residual Heat Removal
RHR-V-53A, B	1	A	Loop A, B outboard isolation valve for shutdown cooling return	

Justification

Valves are interlocked with reactor coolant system pressure such that valves automatically close to protect the RHR pump discharge line from elevated reactor coolant system pressures. Opening circuit is disabled by the same pressure interlocks. Opening these valves during plant operation or bypassing the interlocks associated with the reactor coolant systems could result in over pressurization of the discharge line of the RHR system and may cause the loss of shutdown RHR cooling capability. Interlocks cannot be bypassed with normal control circuits.

In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(2) and (3), all valves when cycled that could either result in a loss of containment integrity if they failed to close or could subject a system to pressures in excess of their design pressures, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ02**

Description

It is not practicable to full or partial stroke exercise the following RFW valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RFW-V-65A, B	1	A	Reactor feedwater isolation valves	Reactor Feedwater

Justification

Closure of either of this Category A valves during normal plant operation would isolate the feed water to the reactor and would result in a loss of flow to the reactor vessel. This could cause a significant reduction of reactor coolant inventory and potentially cause several of the safety systems to initiate.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ03**

Description

It is not practicable to full or partial stroke exercise the following CIA valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
CIA-V-30A, B	2	A	Nitrogen supply to ADS accumulators (outboard CIV)	Containment Instrument Air
CIA-V-20	2	A	Instrument air supply to inboard MSIVs and MSRVs (outboard CIV)	

Justification

1. Testing CIA-V-30A and 30B at power requires securing the safety related nitrogen supply to the ADS valve accumulators. Thus closing these valves at power renders ADS MSRVs inoperable.

2. Testing CIA-V-20 at power isolates instrument supply air from the inboard MSIVs. Excessive system leakage downstream of this valve can result in closure of inboard MSIVs and Plant SCRAM. Monitoring downstream header pressure during valve closure requires installation of a local test gauge in a high radiation area. Reduced exercising frequency is also justified by ALARA.

3. In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(2), all valves when cycled that could either result in a loss of containment integrity if they failed to close, would be acceptable to test only during cold shutdown outages.

   The risks associated with challenging these protective systems during power operations is not considered prudent, and therefore alternative cold shutdown testing frequency is warranted.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ04**

(INACTIVE- FOR CHECK VALVES CIA-41A & 41B TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to full or partial stroke exercise category B CIA valves during normal Plant operation, nor full stroke exercise category C CIA valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
CIA-V-39A, B	3	B	These valves cross connect the normal nitrogen supply for the Main Steam Isolation Valves and Main Steam Relief Valves (including the 7 ADS Valves) accumulators to the backup nitrogen supply for the 7 ADS valves.	Containment Instrument Air
CIA-V-41A, B	3	C		

Justification

Testing these valves requires securing the backup nitrogen supply to the ADS valve accumulators. Isolating the backup nitrogen supply to the ADS and/or MSIVs during normal power operations is not safe to do while the Plant is operating at power.

The risks associated with challenging these protective systems during power operations is not considered prudent, and therefore alternative cold shutdown testing frequency is warranted.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ05**

Description

It is not practicable to full or partial stroke exercise open the following RCIC valve during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-13	1	A	RCIC pump discharge isolation, and containment isolation, and reactor coolant pressure isolation valve.	Reactor Core Isolation Cooling

Justification

This valve is the isolation valve from the RCIC pump discharge to the Reactor Pressure Vessel Head Spray. This Category A valve is an outboard Containment Isolation Valve as well as a Reactor Coolant Pressure Isolation Valve. Opening this valve during normal power operations increases the possibility of over pressurizing a low pressure system with the higher pressure from the Reactor system.

In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(2) and (3), all valves when cycled that could either result in a loss of containment integrity if they failed to close or could subject a system to pressures in excess of their design pressures, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

This valve will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ06**

Description

It is not practicable to full or partial stroke exercise open the following LPCS or RHR valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
LPCS-V-5	1	A	LPCS discharge isolation to the reactor vessel.	Low Pressure Core Spray
RHR-V-42A, B, C	1	A	RHR discharge isolation to the reactor vessel.	Residual Heat Removal

Justification

The risk of injuring Plant personnel, over pressurizing the associated pump and piping, or causing an intersystem LOCA makes the opening of these valves imprudent during power operations. This cold shutdown testing is recommended by NUREG-1482, Revision 2 Section 3.1.1(3).

Alternative Frequency

These valves will be full stroke exercised during cold shutdown

Cold Shutdown Justification – **CSJ07**

Description

It is not practicable to full or partial stroke exercise the following RWCU valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RWCU-V-1	1	A	Containment Iso. RWCU Pump Suction Iso.	Reactor Water Cleanup
RWCU-V-4	1	A	Containment Iso. RWCU Pump Suction Iso.	
RWCU-V-40	1	A	Containment Iso. RWCU Pump Discharge Iso.	

Justification

Testing these valves during power operations requires system shutdown which imposes thermal stresses on the pumps and heat exchangers, significantly increasing the potential for equipment damage. In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(2) and (3), all valves when cycled that could either result in a loss of containment integrity if they failed to close or could subject a system to pressures in excess of their design pressures, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ08**

Description

It is not practicable to full or partial stroke exercise the Main Steam Isolation Valves (MSIVs) during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
MS-V-22A	1	A	Main Steam Line A Inboard Isolation Valve	Main Steam
MS-V-22B	1	A	Main Steam Line B Inboard Isolation Valve	
MS-V-22C	1	A	Main Steam Line C Inboard Isolation Valve	
MS-V-22D	1	A	Main Steam Line D Inboard Isolation Valve	
MS-V-28A	1	A	Main Steam Line A Outboard Isolation Valve	
MS-V-28B	1	A	Main Steam Line B Outboard Isolation Valve	
MS-V-28C	1	A	Main Steam Line C Outboard Isolation Valve	
MS-V-28D	1	A	Main Steam Line D Outboard Isolation Valve	

Justification

Full stroke testing each MSIV during normal reactor operation requires isolating the respective main steam line. These isolations are conducted with the Plant at reduced power, however, the evolution still results in primary system pressure spikes, reactor power fluctuations, and increased flow in the unisolated steam lines. Each of these reactor pressure transients or power excursions has the potential to induce an automatic SCRAM and actuation of the safety relief valves. The risks of challenging these protective systems during power operations could result in a reactor trip or safety system actuation and is therefore not considered prudent. The MSIVs will be full stroked exercised during cold shutdown outages when the MSIVs are able to be isolated.

In addition, close stroke testing of MSIVs requires isolation of non-safety related air, which is not accessible during plant operation.

The implementation of the alternate frequency will contribute to the reduction of the relief valve challenge and failure rate as specifically recommended in NUREG-0626.

Alternative Frequency

These valves will be full stroke exercised and stroke timed during cold shutdown conditions.

Cold Shutdown Justification – **CSJ09**

Description

It is not practicable to full or partial stroke exercise the following MS valve during normal Plant operation.

Plant Affected Valves	Class	Cat.	Function	System(s)
MS-V-146	2	B	Isolation Valve, Main Steam Supply to Auxiliary Equipment	Main Steam

Justification

This valve is normally open at power. Closing this valve at power would isolate steam from the following equipment.

1. Reactor Feed Water Pumps and result in loss of RPV level and a reactor scram.

2. Main Steam Bypass Valves and result in equipment inoperability.

3. Main Steam Air Ejectors and result in loss of Main Condenser vacuum.

Closing this valve at normal power operations would result in the isolation of steam to the equipment as listed above and could result in the initiation of safety systems or equipment.

Alternative Frequency

This valve will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ10**

Description

It is not practicable to full or partial stroke exercise open the following MS valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
MS-V-67A, B, C, D	1	A	Outboard MSIV drain valve (MS-V-28A, B, C, D)	Main Steam

Justification

These Category A valves are normally closed during power operation.

1. Failure of these valves in a non-conservative position (open) during the surveillance testing at normal Plant operation could result in an unacceptable iodine release in the event of an accident, e.g., 26" main steam line break.

2. Failure to close during surveillance testing could result in a loss of containment integrity, because the inboard MSIV is open during normal Plant operation. This cold shutdown testing is recommended by NUREG-1482, Revision 2 Section 3.1.1(2).

3. Cycling of these valves during normal Plant operation could increase the fatigue usage of the superpipe between the MSIV and the MS-V-67 valve above acceptable limits, i.e., Usage > 0.1.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ11**

Description

It is not practicable to full or partial stroke exercise open the following RHR valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RHR-V-16A, B	2	A	Drywell Spray Header (2nd outboard CIV)	Residual Heat Removal
RHR-V-17A, B	2	A	Drywell Spray Header (1st outboard CIV)	

Justification

These Category A valves are normally closed during power operation:

1. Valve exercising during power operation increases the possibility that a containment boundary valve will not be fully closed, thus resulting in loss of containment integrity.

2. These valves are located in relatively high radiation areas and require operators to attach test hoses to supplement the testing of these valves. Reduced exercising frequency is justified by ALARA.

3. Each time these valves are exercised, there is a risk of spraying/wetting down safety related equipment in the drywell (Ref. OER 82083F-INPO SER 41-85, Containment Spraying Events, OER 89040I-7, INPO RSEN 91-01 Recurring Significant Events).

4. During exercising of outboard valves, piping between the valves is filled and pressurized. Inadequate filling of piping before exercising the outboard valve can result in water hammer damage to the RHR system.

5. In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(1) and (2) all valves that when cycled could either cause a loss of system function if they were to fail in a non-conservative position or could result in a loss of containment integrity during the cycling test, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ12**

Description

It is not practicable to full or partial stroke exercise open the following Main Steam valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
MS-V-16	1	A	Containment Isolation	Main Steam
MS-V-19	1	A	Containment Isolation	

Justification

1. These valves are normally closed above 5% power operation.

2. Valve exercising during power operation increases the possibility that a containment boundary valve will not be fully closed, thus resulting in loss of containment integrity.

3. Cycling these valves during power operation produces severe thermal cycles and stress on the drain line piping (reference calculation ME-02-94-37). Each thermal cycle is an unnecessary challenge to piping integrity and Plant safety overall.

4. Valves are inaccessible during power operation. MS-V-16 is inside primary containment and MS-V-19 is in the steam tunnel.

5. In addition as stated in NUREG-1482, Revision 2 Sections 3.1.1(1) and (2) all valves that when cycled could either cause a loss of system function if they were to fail in a non-conservative position or could result in a loss of containment integrity during the cycling test, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ13**

Description

It is not practicable to full or partial exercise the following RCIC valves during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-8	1	A	RCIC Turbine Steam Supply Outboard Containment Isolation Valve	Reactor Core Isolation Cooling
RCIC-V-63	1	A	RCIC Turbine Steam Supply Inboard Containment Isolation Valve	
RCIC-V-76	1	A	RCIC-V-63 Bypass Inboard Containment Isolation Valve	

Justification

1. RCIC-V-8 is the outboard main turbine steam supply valve for the RCIC system and is an outboard primary containment isolation valve. Failure of this valve in a non-conservative position would result in the loss of the RCIC function.

2. RCIC-V-63 is the inboard main turbine steam supply valve for the RCIC system and is an inboard primary containment isolation valve. Failure of this valve in a non-conservative position would result in the loss of the RCIC function.

3. RCIC-V-76 is the bypass for RCIC-V-63 and is an inboard primary containment isolation valve. Failure of this valve in a non-conservative direction would require entry into a 4 hr LCO and require the isolation of RCIC-V-8 resulting in the loss of the RCIC function.

4. Both RCIC-V-63 and RCIC-V-76 are located inside containment and would require a drywell entry to repair if either valve failed in a non-conservative position.

5. As stated in NUREG-1482, Revision 2 Sections 3.1.1(1) and (2), all valves that when cycled could either cause a loss of system function if they were to fail in a non-conservative position or could result in a loss of containment integrity during the cycling test, would be acceptable to test only during cold shutdown outages.

Alternative Frequency

These valves will be full stroke exercised during cold shutdown.

Cold Shutdown Justification – **CSJ14**

Description

It is not practicable to full or partial stroke exercise the following RCIC valve during normal Plant operation.

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-31	2	B	Suppression Pool Suction Supply Outboard Containment Isolation Valve	Reactor Core Isolation Cooling

Justification

RCIC-V-31 is an outboard primary containment isolation valve without a redundant, in series, inside containment valve (see TM-2050). As a primary containment isolation valve, this valve must be capable of remote manual closure to perform the active component function of close. As stated in NUREG-1482, Revision 2 Sections 3.1.1(2) all valves that would result in a loss of containment integrity if they failed to close during a cycling test can be excluded from exercise testing during plant operations. This category of valve would typically include all valves in containment penetrations where the redundant valve is open and inoperable.

Alternative Frequency

This valve will be full stroke exercised during cold shutdown.

5.8 Refueling Outage Justifications

ISTC-3510 states that all Active category A, category B, and category C check valves shall be tested nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222.

ISTC-3521 states that category A and B valves shall be full-stroke tested or exercised during operation at power to the position(s) required to fulfill its function(s). If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC-3522 states that category C check valves shall be exercised during operation at power in a manner that verifies obturator travel by using the methods in ISTC-5221. If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages.

All valve testing required to be performed during a refueling outage shall be completed before returning the Plant to operation at power.

The following valves are identified as being impractical to exercise during Plant operations and cold shutdowns and will therefore be full-stroke exercised during refueling outages. The valves are identified by unique valve numbers and Code identification as to Code Class and Valve Category.

Refueling Outage Justification – **ROJ01**

(INACTIVE- CHECK VALVES TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to exercise the following SLC check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
SLC-V-6	1	C	Standby Liquid Control discharge to reactor vessel	Standby Liquid Control
SLC-V-7	1	AC		

Justification

1. Valves have no operator with which they may be stroked and are located in the primary containment.

2. Exercising the valves require the initiation of the SLC system and full flow injection into the reactor vessel. Initiation of SLC flow involves the discharge of Category D explosively activated valves. This involves destroying the valve and is an impractical evolution to perform during reactor operation or cold shutdowns since it could result in the addition of chemical poison to the reactor vessel. During power operation, the injection of chemical poison would necessitate shutting down the reactor. Poison injection during cold shutdown would require extensive cleanup of the reactor coolant to remove the poison. Furthermore, it would require frequent replacement of the explosive charges in the explosively activated valves, which is costly and burdensome. Paragraph ISTC-5260(c) requires testing of one explosive charge every 2 years.

3. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing. (Applies to SLC-V-7).

4. These valves are not frequently cycled and should not experience a high rate of degradation associated with cycling, such as hinge or seating surface wear.

Alternative Frequency

During each refueling outage:

1. One of the Standby Liquid Control system loops, including the associated explosive valve, will be initiated. A flow path to the Reactor Vessel will be verified by pumping demineralized water to the vessel, this verifies valve opening.

2. Valve closure capability will be verified in conjunction with 10 CFR 50 Appendix J (Type C) testing or by other positive means.

Refueling Outage Justification – **ROJ02**

(INACTIVE- FOR CHECK VALVES CIA-V-21, 31A & 31B TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to exercise the following CIA check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
CIA-V-21	2	AC	Instrument air supply to containment (inside containment)	Containment Instrument Air
CIA-V-31A,B	2	AC	Instrument air supply to ADS valves (inside containment)	
CIA-V-40M,N,P, R,S,U,V	2	AC	Instrument air to ADS Accumulators (inside containment)	
CIA-V-24A,B,C,D	2	AC	Instrument air to Accumulators for inboard MSIVs (inside containment)	
CAS-V-29A,B,C,D	3	AC	Control air to Accumulators for outboard MSIVs (inside steam tunnel)	

Justification

1. NUREG-1482, Revision 2 Section 4.1.6 allows extension of test interval to refueling outage for check valves verified closed by leak testing in accordance with Appendix J to 10 CFR Part 50. (Applies to CIA-V-21, 31A and 31B.)

2. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing. (Applies to CIA-V-24 Series and CIA-V-40 Series.)

   The CIA-V-24 and CIA-V-40 Series check valves are located inside the containment and are inaccessible during power operations and during cold shutdowns when the containment is inerted. There is no way to remotely isolate the valves and observe the pressure decay of the accumulators.

3. There is no local or remote position indication for these check valves. These valves can be verified closed only by performing a leak-rate test. This requires reconfiguring the system, hook-up and disconnection of leak test apparatus. (Applies to all referenced valves.)

Refueling Outage Justification – **ROJ02** (Contd.)

**(INACTIVE- FOR CHECK VALVES CIA-V-21, 31A & 31B
TESTED I.A.W. CONDITION MONITORING PLAN)**

4. Due to system design, no practical method exists to perform this testing during power operations and during cold shutdowns when the containment is inerted. (Applies to all referenced valves.)

   The CAS-V-29 Series check valves are located in an area inaccessible during power operation, but accessible during cold shutdown conditions with containment inerted. The testing requires disassembly of mechanical connections which challenges the integrity/functionality of the system. The testing also requires the depressurization of the Reactor Building Service Air header. The risk of inducing a system fault due to disassembly and reassembly of system parts is increased with the frequency of occurrence and thus renders this approach impractical for a cold shutdown test frequency. In this case, the increased risk of system malfunction due to testing exceeds the benefit of testing these check valves on a cold shutdown test frequency.

5. Each time an MSIV is exercised, the corresponding accumulator check valve is exercised. This testing effectively demonstrates there is no blockage in the air supply lines to the MSIV, but does not effectively demonstrate check valve closure and hence does not effectively detect a stuck open check valve. [Applies to CIA-V-24 Series and CAS-V-29 Series.]

Alternative Frequency

During each refueling outage:

1. Pressure decay or flow make up leakage tests will be performed on the accumulators in order to verify closure of CAS-V-29 Series, CIA-V-24 and 40 Series check valves and opening ability of CIA-V-21, 31A, 31B and 40 series.

2. Closure of CIA-V-21, 31A, and 31B will be verified by normal 10 CFR 50, Appendix J (Type C) testing.

Refueling Outage Justification – **ROJ03**

Description

It is not practicable to exercise the following RHR check valve during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RHR-V-209	1	AC	Containment isolation and Reactor Coolant System Pressure Boundary and pressure relief for piping between valves RHR-V-8 and 9.	Residual Heat Removal

Justification

1. This check valve is located inside the containment and does not have valve position indication or an operator of any type. It cannot be tested without interrupting RHR shutdown cooling flow. During power operations, access is prohibited. During cold shutdown conditions, RHR cannot be out of service more than 2 hours per an 8 hour interval (per Columbia Generating Station Technical Specification 3.4.10). Additionally, containment may not be de-inerted during all cold shutdowns.

2. This valve is normally closed and is verified to be adequately seated by leak tests during each refueling outage. This valve performs the passive safety functions of containment isolation and reactor coolant system pressure isolation. Its active function of relieving pressure between valves RHR-V-8 and RHR-V-9 is a very unlikely situation and could only occur during time periods where both RHR-V-8 and 9 are shut and containment temperature is significantly above normal (i.e., LOCA condition). The proposed alternate testing avoids extraordinary testing efforts.

3. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing.

Alternative Frequency

During each refueling outage, this check valve will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ04**

(INACTIVE- CHECK VALVES TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to exercise the following check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
PI-V-X72f/1	2	AC	Containment Isolation	Process Instrumentation
PI-V-X73e/1	2	AC	Containment Isolation	
TIP-V-6	2	AC	Containment Isolation	Traversing Incore Probe

Justification

1. These check valves are located on the discharge of the radiation leak detection monitors and on the purge system for the TIP. These containment isolation valves are located inside the containment and are inaccessible during power operation and during cold shutdowns when the containment is inerted. Therefore, it is impractical to test these check valves quarterly during power operations or during cold shutdowns when containment remains inerted.

2. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing.

Alternative Frequency

During each refueling outage, each of these check valves will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ05**

(INACTIVE- CHECK VALVE TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to exercise the following RCC check valve during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RCC-V-219	2	AC	Pressure relief around RCC-V-40 check	Reactor Closed Cooling Water

Justification

1. This check valve is located around the inboard isolation valve on the RCC return line. The valve is located inside containment and is inaccessible during power operation and during cold shutdowns when the containment is inerted. Therefore, it is impractical to test this check valve quarterly during power operations or during cold shutdowns when containment remains inerted.

2. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing.

Alternative Frequency

During each refueling outage, this check valve will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ06**

It is not practicable to exercise the following RFW check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RFW-V-10A, B	1	AC	Reactor feedwater inboard check valve	Reactor Feedwater
RFW-V-32A, B	1	AC	Reactor feedwater outboard check valve	

Justification

1. NUREG-1482, Revision 2 Section 4.1.6, allows extension of test interval to refueling outage for check valves verified closed by leak testing in accordance with Appendix J to 10 CFR Part 50.

2. There is no local or remote position indication for these check valves. These valves can be verified closed only by performing a leak-rate test. This requires reconfiguring the system, hook-up and disconnection of leak test apparatus.

3. These valves are held open by feedwater flow and cannot be closed during power operation.

Alternative Frequency

These valves will be verified close by leak-rate testing during each refueling outage. These valves are open during the Plant operation to supply water to the reactor.

Refueling Outage Justification – **ROJ07**

Description

It is not practicable to exercise the following MS valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
MS-V-37 Series (Typ 18)	3	C	Open: To break vacuum in the downcomers of the main steam relief valves.	Main Steam
MS-V-38 Series (Typ 18)	3	C	Close: To direct steam to the quenchers in the wetwell.	

Justification

1. The vacuum breaker system allows MSRV downcomer pressure to equalize with drywell pressure as downcomer steam is condensed in the suppression pool. The 36 normally closed check valves (2 on each downcomer) are not equipped with an external means of actuation for exercising the valve. Testing these valves is impractical with the reactor operating or the containment inerted as this testing requires personnel entry into the containment building.

2. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing.

Alternative Frequency

These valves will be exercised when the reactor is shutdown and the containment de-inerted during each refueling outage. Breakaway force required to move the valve disc off its seat is measured. The valves are also manually operated and visually verified to open and reseat.

Refueling Outage Justification – **ROJ08**

Description

It is not practicable to exercise the following check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-66	1	AC	RCIC discharge to the reactor vessel head	Reactor Core Isolation Cooling
RCIC-V-65	1	C	RCIC discharge to the reactor vessel head	Reactor Core Isolation Cooling
LPCS-V-6	1	AC	LPCS discharge to the reactor vessel	Low Pressure Core Spray
HPCS-V-5	1	AC	HPCS Discharge to the reactor vessel	High Pressure Core Spray
RHR-V-41A, B, C	1	AC	RHR Loop A, B, C discharge to the reactor vessel	Residual Heat Removal
RHR-V-50A, B	1	AC	RHR Loop A, B discharge to the recirculating pump discharge	Residual Heat Removal

Justification

1. These valves (except RCIC-V-65) function as Reactor Coolant System Pressure Boundary Isolation valves. This requires the check valve disc to properly seat and achieve a relatively leak-tight seal. Technical Specification SR 3.4.6.1 requires seat leakage testing of these valves at IST program frequency. Each pressure isolation valve is individually leak tested in accordance with the differential pressure requirements of the Code. Seat leakage as a method of showing valve closure testing is labor and dose intensive and as such impractical to perform during each cold shutdown and should be tested during refueling outages only.

2. Due to lack of position indications (except RCIC-V-65), the other positive means of verifying these valves fully open is by passing the required accident condition flow through these valves. This is an acceptable full-stroke per NUREG-1482, Revision 2 Section 4.1.3.

3. With flow rates on the order of 7500 gpm (ECCS), vessel level rises at a rate of 38 inches per minute. Operating ranges for RPV level provides a narrow band in which to work, making any such injection a challenge to Plant Technical Specification limits and can result in flooding of main steam lines.

4. Because of the differences in water chemistry, frequent injections of Suppression Pool water into the RPV is undesirable and can lead to additional crud accumulations in the crevices of piping nozzles, etc., thus resulting in higher dose rates in containment.

Refueling Outage Justification – **ROJ08** (Contd.)

5. The subject valves are inspected internally periodically.

6. During normal Plant operation, these valves are normally closed and do not open.

7. NUREG-1482, Revision 2 Section 3.1.1.3 states that valves may be tested during refueling outages if they would otherwise be tested during cold shutdown outages that require the containment to be de-inerted for performance of valve testing.

8. NUREG-1482, Revision 2 Section 4.1.6 allows extension of the test interval to refueling outage for check valves verified closed by leak testing.

Alternative Frequency

During each refueling outage:

11. Closure ability of these valves (except RCIC-V-65) shall be demonstrated by leakage test as required by Technical Specification SR 3.4.6.1.

12. Opening ability of these valves shall be demonstrated by passing the maximum required accident condition flow through these valves.

13. Verify closure of RCIC-V-65.

Refueling Outage Justification – **ROJ09**

(INACTIVE- FOR CHECK VALVES CSP-V70 THROUGH CSP-V-79 TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to exercise the following CSP check valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
CSP-V-65	2	AC	Close: To provide isolation for safety related control air to containment isolation valves CSP-V-5, 6 and 9.	Containment Supply and Purge
CSP-V-70 through CSP-V-79	2	C	Open: To provide safety related control air to containment isolation valves CSP-V-5, 6 and 9.	

Justification

1. There is no local or remote position indication for these check valves. Testing these valves requires partial depressurization of the supply header. Although, only partial depressurization is expected, full depressurization could easily occur due to leaky boundary valves, operator error, or check valve failure. Depressurization of the supply header to CSP-V-5, 6 and 9 will cause these containment isolation valves to fail open.

2. Due to system design, no practical method exists to perform this testing during power operations or during cold shutdowns. CSP-V-65 can only be verified closed by performing a special pressure decay leak-rate test. This requires reconfiguring the system and hook-up and disconnection of leak test apparatus. This requires the system to be breached and a portion depressurized.

3. To verify CSP-V-70 through 79 open, flow from each of the 10 Nitrogen bottles and thus through each of these check valves must be demonstrated. This requires the system to be breached and the safety related supply header depressurized and would be performed in conjunction with the pressure decay test to verify closure of CSP-V-65. This testing will deplete safety related nitrogen inventory and will require replacement of depleted nitrogen bottles after the test.

4. Review of the maintenance history for CSP-V-65 reveals that no failures have been observed. Failure of CSP-V-65 to close and its effects pertaining to Probabilistic Risk Assessment core melt frequency indicates a negligible increase in containment failure frequency.

Alternative Frequency

During each refueling outage, each of these check valves will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ10**

Description

It is not practicable to full or partial stroke exercise open the following RHR valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RHR-V-8	1	A	Isolate RHR shutdown cooling suction line from reactor recirculation loop A	Residual Heat Removal
RHR-V-9	1	A		

Justification

1. Valves are interlocked with reactor coolant system pressure such that these valves automatically close to protect the RHR pump suction line from elevated reactor coolant system pressures. Opening circuit is disabled by the same pressure interlocks. Overpressurization of the suction line may cause the loss of RHR shutdown cooling capability. Interlocks cannot be bypassed with normal control circuits.

2. Full stroke testing at cold shutdown frequency degrades the outage safety plan because the RHR shutdown cooling function is lost. RHR-V-8 and 9 should be stroked at refueling outage frequency when testing can be scheduled for minimal impact to the Plant. With shutdown cooling unavailable, it puts the Plant in the yellow band of the outage safety plan, and in a 2 hour LCO (Technical Specification 3.4.10). If tested at refueling outage frequency, the testing can be scheduled at the end of the outage when decay heat load is lowest.

3. Valves are exercised during every outage when the RHR shutdown cooling function is initiated.

Alternative Frequency

During each refueling outage, each of these valves will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ11**

Description

It is not practicable to full or partial stroke exercise open the following RHR valves during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RHR-V-123A, B	1	A	CIV, HI-LO Pressure Isolation	Residual Heat Removal

Justification

1. These valves are normally closed with the motor operator deenergized during power operations and function as Reactor Coolant Pressure Boundary/Containment Isolation Valves. Opening the valves for the sole purpose of verifying the ability to close is not prudent, as it presents an unnecessary challenge to the containment and increases the potential for an intersystem LOCA.

2. These valves have no active safety function. The MOVs are deenergized during Modes 1, 2 or 3. Columbia Generating Station Technical Specification SR 3.6.1.3.5 requires verification of isolation time of these valves per IST Program.

Alternative Frequency

During each refueling outage, each of these valves will be tested per ISTC Code requirements.

Refueling Outage Justification – **ROJ12**

(INACTIVE- CHECK VALVE TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to full stroke exercise the following RCIC check valve during normal Plant operation or cold shutdown.

Affected Valves	Class	Cat.	Function	System(s)
RCIC-V-30	2	C	Suppression pool to RCIC-P-1 suction check	Reactor Core Isolation Cooling

Justification

1. This check valve is located on the suction piping from suppression pool for RCIC-P-1. Normal quarterly testing of RCIC system is with suction from Condensate Storage Tank (CST) and the pump discharge to CST.

2. Section 4.1.6 of NUREG-1482, Revision 2, states the need to set up test equipment is adequate justification to defer reverse flow testing of check valves to a refueling outage frequency. This position is also stated in response to question 2.3.19 in, “Summary of Public Workshops held in NRC Regions on Inspection Procedure (IP) 73756, “Inservice Testing of Pumps and Valves”, and Answers to Panel Questions on Inservice Testing issues.”

3. Verifying RCIC-V-30 full open by passing the required accident flow through the check valve will require pumping suppression pool water into the CST. Because of the differences in water chemistry, frequent injections of suppression pool water into the CST is undesirable. Thus, full flow testing should be limited to refueling outages only.

Alternative Frequency

Each refueling outage, during startup after refueling the valve will be verified full open by passing the maximum required accident condition flow through the valve per procedure OSP-RCIC/IST-B501. As an alternate, Non-Intrusive Testing Technique may also be used to verify the valve full open. Valve will also be verified closed.

Refueling Outage Justification – **ROJ13**

Description

It is not practicable to full or partial stroke exercise closed the following RCC valves during normal Plant operation or cold shutdown outages.

Affected Valves	Class	Cat.	Function	System(s)
RCC-V-5	2	A	Isolation valves for reactor closed cooling water lines penetrating the primary containment.	Reactor Closed Cooling Water
RCC-V-21	2	A		
RCC-V-40	2	A		
RCC-V-104	2	A		

Justification

Closure of any isolation valve will interrupt cooling water flow to the Reactor Recirculation (RRC) Pump seals, to the RRC pump motor coolers and to the Drywell Air Coolers possibly causing failure of this equipment. Stopping the RRC Pumps for the sole purpose of performing testing of the above listed RCC valves could extend the Cold Shutdown period.

As stated in NUREG-1482, Revision 2 Section 3.1.1.4 states, Subsection ISTC of the OM Code allows licensees to extend the test interval to defer testing to refueling outages when it is not practical to perform the tests during power operation or cold shutdown outages. The NRC staff believes that licensees need not schedule valve testing that requires stopping and restarting reactor coolant pumps during each cold shutdown solely to allow for the testing of such valves. This repetitive cycling would increase pump wear and stress, as well as the number of cycles of related plant equipment, and could extend the length of cold shutdown outages.

Alternative Frequency

During each refueling outage, each of these valves will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ14**

(INACTIVE- FOR CHECK VALVES RRC-V-13A & 13B TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to full or partial stroke exercise the following RRC valves during normal Plant operation or cold shutdowns.

Affected Valves	Class	Cat.	Function	System(s)
RRC-V-13A,B	2	AC	Inboard and outboard isolation valves for the recirculation pumps seal purge line	Reactor Recirculation
RRC-V-16A,B	2	A		

Justification

Closure of the Category A isolation valves (RRC-V-16A/B) during power operations or cold shutdowns when the RRC pumps are operating is not permitted as this will interrupt seal purge water flow to the Reactor Recirculation (RRC) Pumps. Loss of purge flow may result in excessive seal wear and possibly failure of the pump seals, to the RRC pump.

Category AC valves (RRC-V-13A/B) are held open by purge water flow and cannot be closed during power operations or cold shutdowns when the RRC pumps are operating as this would isolate seal purge water flow to the RRC pumps and could result in excessive wear and possible failure of the seals possibly causing failure of this equipment. Stopping the RRC Pumps for the sole purpose of performing testing of the above listed RRC valves could extend the Cold Shutdown period.

As stated in NUREG-1482, Revision 2 Subsection 3.1.1.4 states, Subsection ISTC of the OM Code allows licensees to extend the test interval to defer testing to refueling outages when it is not practical to perform the tests during power operation or cold shutdown outages. The NRC staff believes that licensees need not schedule valve testing that requires stopping and restarting reactor coolant pumps during each cold shutdown period solely to allow for the testing of such valves. This repetitive cycling would increase pump seal wear and stress, as well as the number of cycles of related plant equipment, and could extend the length of cold shutdown outages.

Alternative Frequency

During each refueling outage, each of these valves will be tested per Subsection ISTC Code requirements.

Refueling Outage Justification – **ROJ15**

(INACTIVE- FOR CHECK VALVES CIA-V-52A TO 66A, CIA-52B TO 70B, CIA-V-103A & 103B TESTED I.A.W. CONDITION MONITORING PLAN)

Description

It is not practicable to full or partial stroke exercise open the following CIA valves during normal Plant operation or cold shutdown outages.

Affected Valves	Class	Cat.	Function	System(s)
CIA-SPV-1B to 19B	3	B	CIA nitrogen bottle auto isolation valve.	Containment Instrument Air
CIA-SPV-1A to 15A	3	B		
CIA-V-52A to 66A	3	C	CIA nitrogen bottle discharge check valves.	
CIA-V-52B to 70B	3	C		
CIA-V-103A, B	3	C	CIA remote nitrogen bottle discharge check valves.	

Justification

Valve testing requires overriding valve control circuitry, isolating or expending emergency nitrogen supply tanks, and venting the system. This would inhibit the system from performing its designed safety function in case of an emergency. Performing the valve testing during normal cold shutdowns could result in the expending of emergency nitrogen tanks and depleting the supply of the emergency nitrogen system. In order to perform bi-directional testing of the check valves as required by OM Code Subsection ISTC, this would require the nitrogen supply to be depleted in order to verify forward flow thru the check valve and then isolated for reverse closure verification. As a result of the necessity to re-pressurize the emergency nitrogen due to the depletion caused by the testing of the check valves, this could result in a potential delay in startup from a cold shutdown condition.

As stated in NUREG-1482, Revision 2 Sections 3.1.1, Subsection ISTC of the OM Code allows licensees to extend the test interval to defer testing to refueling outages when it is not practical to perform the tests during power operation or cold shutdown outages. Excessive manipulation of these valves can result in depletion of nitrogen supply and the requirement to resupply the nitrogen, could extend the length of cold shutdown outages.

Alternative Frequency

During each refueling outage, each of these valves will be tested per Subsection ISTC Code requirements.

5.9 Relief Requests From Certain Subsection ISTC and Mandatory Appendix I Requirements

Relief Requests either provide alternative to Code requirements in accordance with 10 CFR 50.55a(a)(3)(i) or relief from impractical Code requirements in accordance with 10 CFR 50.55a(f)(5)(iii). They provide technical justification and propose alternate testing to be performed in lieu of the Code required testing.

Relief Request – **RV01**

Relief Request
in Accordance with 10 CFR 50.55a(f)(5)(iii)

– Inservice Testing Impracticality –

ASME Code Components Affected

Affected Valves	Class	Cat.	Function	System(s)
CVB-V-1AB CVB-V-1CD CVB-V-1EF CVB-V-1GH CVB-V-1JK CVB-V-1LM CVB-V-1NP CVB-V-1QR CVB-V-1ST	2	AC	To break vacuum on the drywell to suppression chamber downcomers and to limit steam leakage from the downcomer to the wetwell gas space.	Primary Containment Cooling and Purge

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code

Applicable Code Requirement

OM Subsection ISTC-3630, Leakage Rate for Other Than Containment Isolation Valves.

Impracticality of Compliance

These check valves cannot be tested individually therefore, assigning a limiting leakage rate for each valve or valve combination is not practical.

Burden Caused by Compliance

Subsection ISTC-3630 requires Category A valves, other than containment isolation valves, to be individually leak tested at least once every two years. Each vacuum relief valve assembly consists of two independent testable check valves in series with no instrument located between them to allow testing of each of the two check valves. Therefore, leak testing in accordance with the Code is impractical. Modifications to allow individual testing of these valves would require a major system redesign and be burdensome.

Proposed Alternative and Basis for Use

These valves will be leak tested in accordance with Columbia Generating Station Technical Specifications SR 3.6.1.1.2, SR 3.6.1.1.3, and SR 3.6.1.1.4 during refueling outages.

Relief Request – **RV01** (Contd.)

Technical Specifications SR 3.6.1.1.2 drywell-to-suppression chamber bypass leakage test monitors the combined leakage of three types of pathways: (1) the drywell floor and downcomers, (2) piping externally connected to both the drywell and suppression chamber air space, and (3) the suppression chamber-to-drywell vacuum breakers. The test frequency is 120 months and 48 months following one test failure and 24 months if two consecutive tests fail until two consecutive tests are less than or equal to the bypass leakage limit.

Technical Specifications SR 3.6.1.1.3 establishes a leak rate test frequency of 24 months for each suppression chamber-to-drywell vacuum breaker pathway, except when the leakage test of SR 3.6.1.1.2 has been performed (Note to SR 3.6.1.1.3). Thus, each suppression chamber-to-drywell vacuum breaker pathway will have a leak test frequency of 24 months by either SR 3.6.1.1.2 or SR 3.6.1.1.3.

Technical Specifications SR 3.6.1.1.4 establishes a leakage test frequency of 24 months to determine the suppression chamber-to-drywell vacuum breaker total bypass leakage, except when the bypass leakage test of SR 3.6.1.1.2 has been performed (Note to SR 3.6.1.1.4). Thus, the determination of suppression chamber-to-drywell vacuum breaker total leakage will have a leak test frequency of 24 months by either SR 3.6.1.1.2 or SR 3.6.1.1.4.

These valves are also verified-closed by position indicators, exercised, and tested in the open direction using a torque wrench per Technical Specification SR 3.6.1.7.1, SR 3.6.1.7.2, and SR 3.6.1.7.3. In accordance with a separate commitment, the valves are visually inspected each refueling outage.

Quality/Safety Impact

The leakage criteria and corrective actions specified in the Columbia Generating Station Technical Specifications SR 3.6.1.1.2, SR 3.6.1.1.3, and SR 3.6.1.1.4 combined with visual examination of valve seats every refuel outage provides adequate assurance of the relief valve assembly's ability to remain leak tight and to prevent a suppression pool bypass. Thus, proposed alternative provides adequate assurance of material quality and public safety.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

This relief was granted for the third 10 year interval. NRC approval was documented in a letter dated May 15, 2007 (ADAMS Accession Number ML 071010344, TAC No. MD3549) for Relief Request No. RV01.

Relief Request – **RV01** (Contd.)

References

Letter dated February 9, 2007, Carl F. Lyon (NRC) to J. V. Parish (Energy Northwest), "Columbia Generating Station - Issuance of Amendment RE: Suppression Chamber-to-Drywell Vacuum Breakers and Drywell-to-Suppression Chamber Bypass Leakage Test (TAC No. MD1225)".

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RV02**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

– Alternative Provides Acceptable Level of Quality and Safety –

ASME Code Components Affected

Affected Valves	Class	Cat.	Function	System(s)
PSR-V-X73-1	2	A	Containment Isolation	Post Accident Sampling
PSR-V-X80-1	2	A		
PSR-V-X83-1	2	A		
PSR-V-X77A1	1	A		
PSR-V-X82-1	2	A		
PSR-V-X84-1	2	A		
PSR-V-X77A3	1	A		
PSR-V-X82-7	2	A		
PSR-V-X88-1	2	A		

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code

Applicable Code Requirement

OM Subsection ISTC-5150, Solenoid-Operated Valves, Stroke Testing

Reason for Request

Subsection ISTC-5151(c) requires the stroke time of all solenoid-operated valves to be measured to at least the nearest second. These nine PSR solenoid valves are the inboard Containment Isolation Valve for nine different penetrations and are operated from a single keylock control switch. It is impractical to measure the individual valve stroke times. To do so would require repetitive cycling of the control switch causing unnecessary wear on the valves and control switch with little compensating benefit.

Relief Request – **RV02** (Contd.)

Proposed Alternative and Basis for Use

All of these solenoid valves stroke in less than 2 seconds and are considered Fast-Acting valves. Their safety function is to close to provide containment isolation. The stroke time of the slowest valve will be measured by terminating the stroke time measurement when the last of the nine indicating lights becomes illuminated. If the stroke time of the slowest valve is in the acceptance range (less than or equal to 2 seconds), then the stroke times of all valves will be considered acceptable. However, if the stroke time of the slowest valve exceeds the acceptance criteria (2 seconds), all 9 valves will be declared inoperable and corrective actions in accordance with Subsection ISTC-5153 taken. After corrective actions, the required reference values shall be established in accordance with ISTC-3300. Also any abnormality or erratic action shall be recorded and an evaluation shall be made regarding need for corrective action as required by ISTC-5151(d).

Quality/Safety Impact

The proposed alternate testing will verify that the valves respond in a timely manner and provide information for monitoring signs of material degradation. This provides adequate assurance of material quality and public safety.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

Similar relief was granted for the third 10 year interval. NRC approval was documented in a letter dated March 23, 2007 (ADAMS Accession Number ML 070600111, TAC No. MD3550) for Relief Request No. RV03.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RV03**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

– Alternative Provides Acceptable Level of Quality and Safety –

ASME Code Components Affected

Affected Valves	Class	Cat.	Function	System(s)
MS-RV-1A, B, C, D	1	C	Overpressure Protection	Main Steam
MS-RV-2A, B, C, D	1	C		
MS-RV-3A, B, C	1	C		
MS-RV-3D	1	C	Overpressure Protection and Auto Depressurization System to lower reactor pressure sufficient to allow initiation of Low Pressure Coolant Injection (RHR, LPCI mode)	
MS-RV-4A, B, C, D	1	C		
MS-RV-5B, C	1	C		

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code

Applicable Code Requirement

Mandatory Appendix I, Paragraph I-3310: Sequence of Periodic Testing of Class 1 Main Steam Pressure Relief Valves with Auxiliary Actuating Devices.

Mandatory Appendix I, Paragraph I-3310, states that tests before maintenance or set-pressure adjustment, or both, shall be performed for I-3310(a), (b), and (c) in sequence. The remaining shall be performed after maintenance or set-pressure adjustments:

(a) visual examination;
(b) seat tightness determination, if practicable;
(c) set-pressure determination;
(d) determination of electrical characteristics and pressure integrity of solenoid valve(s);
(e) determination of pressure integrity and stroke capability of air actuator;
(f) determination of operation and electrical characteristics of position indicators;
(g) determination of operation and electrical characteristics of bellows alarm switch;
(h) determination of actuating pressure of auxiliary actuating device sensing element, where applicable, and electrical continuity; and
(i) determination of compliance with the Owner's seat tightness criteria.

Relief Request – **RV03** (Contd.)

Reason for Request

Relief is requested from requirements for sequence of periodic testing of Class 1 Main Steam pressure relief valves with auxiliary actuating devices.

1. Remote set-pressure verification devices (SPVDs) have been permanently installed on all eighteen Main Steam Relief Valves (MSRVs) to allow set-pressure testing at low power operation, typically during shutdown for refueling outage and on startup if necessary. These SPVDs incorporate a nitrogen powered, metal bellows assembly that adds a quantified lifting force on the valve stem until the MSRV's popping pressure is reached. During normal power operation, these SPVDs remain deenergized and do not interfere with normal safety or relief valve functions. Removal and replacement of the MSRVs is normally performed only for valve maintenance and not for the purpose of as-found set-pressure determination. MSRVs are removed and replaced for maintenance purposes (e.g., seat leakage, refurbishment) nominally each refueling outage. The valves which are required to be as-found set-pressure tested, as part of the Code required periodic testing, do not necessarily correspond to those required to be replaced for maintenance. Actuators and solenoids are separated from the valve and remain in place when MSRVs are removed and replaced for maintenance.

   As found visual examinations cannot be performed per the Code required sequence while the drywell is inerted. Visual examinations are performed after reactor shutdown but prior to maintenance or set-pressure adjustments.

   If due to a reactor scram, MSRV periodic set-pressure testing could not be performed at power during shutdown for refueling outage, it will be required to be performed during power ascension from refueling outage or by removing the valves and sending them to the vendor for as-found set-pressure testing. This would require Paragraphs I-3310(a), (d), (e), (f), and (h) tests to be performed during outage prior to Paragraphs I-3310(b), (c) and (i) tests. Paragraph I-3310(g) is not applicable to these valve designs.

2. "Valves" and "accessories" (actuators, solenoids, etc.) have different maintenance and test cycles due to the methods used for maintenance and testing at Columbia Generating Station as discussed in item 1., and should be considered separately for the purposes of meeting the required test frequency and testing requirements. Valve testing (i.e., visual examination, seat tightness, set-pressure determination and compliance with Owner's seat tightness criteria, in accordance with Paragraphs I-3310(a), (b), (c) and (i)) are independent of and can be separate from testing of "accessories" (i.e., solenoids, actuator, position indicators and pressure sensing element, in accordance with Paragraphs I-3310(d), (e), (f), and (h)). Paragraph I-3310 states that tests before maintenance or set-pressure adjustment, or both, shall be performed for I-3310(a), (b), and (c) in sequence. The remaining shall be performed after maintenance or set-pressure adjustments. Valve maintenance or set-pressure adjustment does not affect "accessories" testing; likewise, maintenance on "accessories" does not affect valve set-pressure or seat leakage. Therefore, the MSRVs and the "accessories" may be tracked separately for the purpose of satisfying the Paragraph I-1320 test frequency requirements.

Relief Request – **RV03** (Contd.)

3. Paragraph I-3310(f) requires determination of operation and electrical characteristics of position indicators, and Paragraph I-3310(h) requires determination of actuating pressure of auxiliary actuating device sensing element and electrical continuity. These tests are required to be performed at the same frequency as the valve set-pressure and auxiliary actuating device testing.

   The position indicators are all calibrated and functional tested during outages; the sensing elements (pressure switches) are all checked and calibrated at least once per 24 months. Although the existing tests do not have a one-to-one correlation to the valve or actuator tests, these calibrations and functional tests meet all testing requirements of this Subsection, and far exceed the required test frequency and testing requirements.

Proposed Alternative and Basis for Use

1. "Valves" and "accessories" (actuators, solenoids, etc.) shall be tested separately and meet Paragraph I-1320 test frequency requirements. Since the valve and actuator test and maintenance cycles are different, the plant positions of the actuators selected, or due, for periodic testing may not match the plant positions of the MSRVs selected, or due, for as-found set-pressure testing.

   MSRV periodic set-pressure testing will normally be performed at power during shutdown for refueling outage. As-found visual examination will be performed after set-pressure testing which is out of specified Code required sequence.

   If MSRV periodic set-pressure testing could not be performed at power during shutdown for refueling outage due to reactor scram it will be required to be performed during power ascension from refueling outage or by removing the valves and sending them to the vendor for as-found set-pressure testing. This will require Paragraphs I-3310(a), (d) and (e) tests to be performed during outage prior to Paragraphs I-3310(b), (c) and (i) tests.

   The actuators and solenoids will be tested at the end of the outage after other maintenance is complete, and the tests will be credited as satisfying the Code periodic test requirements provided that no actuator or solenoid maintenance (other than actuator assembly re-installation on a replaced valve) is performed that would affect their as-found status prior to testing or that could affect the valve’s future set-pressure determination.

2. All MSRV position indicators will continue to be tested in accordance with existing surveillance procedures for monthly channel checks, and for channel calibration and channel functional testing at least once per 24 months during shutdowns. These tests will be credited for satisfying the requirements of Paragraph I-3310(f).

3. All auxiliary actuating device sensing elements (pressure switches) will continue to be tested and calibrated on a 24 month frequency. These tests will be credited for satisfying the requirements of paragraph I-3310(h).

Relief Request – **RV03** (Contd.)

Quality/Safety Impact

Due to different maintenance and test cycles of valves and accessories and also due to methods used for testing and maintenance, it is impractical to meet the Code required testing requirements without subjecting the valves to unnecessary challenges and increased risk of seat degradation. The requirement for testing actuators and accessories in a specific sequence does not enhance system or component operability, or in any way improve nuclear safety. The proposed alternate testing adequately evaluates the operational readiness of these valves commensurate with their safety function. This will help reduce the number of challenges and failures of safety relief valves and still provide timely information regarding operability and degradation. This will provide adequate assurance of material quality and public safety.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

Similar relief request was granted for the third 10 year interval. NRC approval was documented in a letter dated March 23, 2007 (ADAMS Accession Number ML 070600111, TAC No. MD3551) for Relief Request No. RV04.

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).

Relief Request – **RV04**

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

– Alternative Provides Acceptable Level of Quality and Safety –

ASME Code Components Affected

Affected Valves	Class	Cat.	System(s) / Function
PI-EFC-X37E, PI-EFC-X37F	1	C	System(s): Process Instrumentation for various systems connected to RPV Function: Excess flow check valves are provided in each instrument process line that is part of the reactor coolant pressure boundary. Design and installation of the excess flow check valves at Columbia Generating Station conform to Regulatory Guide 1.11. Close: The reactor instrument line excess flow check valves close to limit the flow in the respective instrument lines in the event of an instrument line break downstream of the EFCVs outside containment.
PI-EFC-X38A, PI-EFC-X38B, PI-EFC-X38C, PI-EFC-X38D, PI-EFC-X38E, PI-EFC-X38F	1	C	
PI-EFC-X39A, PI-EFC-X39B, PI-EFC-X39D, PI-EFC-X39E	1	C	
PI-EFC-X40C, PI-EFC-X40D	1	C	
PI-EFC-X40E, PI-EFC-X40F	2	C	
PI-EFC-X41C, PI-EFC-X41D	1	C	
PI-EFC-X41E, PI-EFC-X41F	2	C	
PI-EFC-X42A, PI-EFC-X42B	1	C	
PI-EFC-X44AA, PI EFC X44AB, PI-EFC-X44AC, PI-EFC-X44AD, PI-EFC-X44AE, PI-EFC-X44AF, PI-EFC-X44AG, PI-EFC-X44AH, PI-EFC-X44AJ, PI-EFC-X44AK, PI-EFC-X44AL, PI-EFC-X44AM	1	C	
PI-EFC-X44BA, PI-EFC-X44BB, PI-EFC-X44BC, PI-EFC-X44BD, PI-EFC-X44BE, PI-EFC-X44BF, PI-EFC-X44BG, PI-EFC-X44BH, PI-EFC-X44BJ, PI-EFC-X44BK, PI-EFC-X44BL, PI-EFC-X44BM	1	C	
PI-EFC-X61A, PI-EFC-X61B	1	C	
PI-EFC-X62C, PI-EFC-X62D	1	C	
PI-EFC-X69A, PI-EFC-X69B, PI-EFC-X69E	1	C	
PI-EFC-X70A, PI-EFC-X70B, PI-EFC-X70C, PI-EFC-X70D, PI-EFC-X70E, PI-EFC-X70F	1	C	
PI-EFC-X71A, PI-EFC-X71B, PI-EFC-X71C, PI-EFC-X71D, PI-EFC-X71E, PI-EFC-X71F	1	C	
PI-EFC-X72A	1	C	
PI-EFC-X73A	1	C	

Relief Request – **RV04** (Contd.)

Affected Valves	Class	Cat.	System(s) / Function
PI-EFC-X74A, PI-EFC-X74B, PI-EFC-X74E, PI-EFC-X74F	1	C	System(s): Process Instrumentation for various systems connected to RPV Function: Excess flow check valves are provided in each instrument process line that is part of the reactor coolant pressure boundary. Design and installation of the excess flow check valves at Columbia Generating Station conform to Regulatory Guide 1.11. Close: The reactor instrument line excess flow check valves close to limit the flow in the respective instrument lines in the event of an instrument line break downstream of the EFCVs outside containment.
PI-EFC-X75A, PI-EFC-X75B, PI-EFC-X75C, PI-EFC-X75D, PI-EFC-X75E, PI-EFC-X75F	1	C	
PI-EFC-X78B, PI-EFC-X78C, PI-EFC-X78F	1	C	
PI-EFC-X79A, PI-EFC-X79B	1	C	
PI-EFC-X106	1	C	
PI-EFC-X107	1	C	
PI-EFC-X108	1	C	
PI-EFC-X109	1	C	
PI-EFC-X110	1	C	
PI-EFC-X111	1	C	
PI-EFC-X112	1	C	
PI-EFC-X113	1	C	
PI-EFC-X114	1	C	
PI-EFC-X115	1	C	

Applicable Code Edition and Addenda

The 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code

Applicable Code Requirement

OM Subsection ISTC-3522(c), Category C Check Valves. If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages.

OM Subsection ISTC-3700, Valve Position Verification. Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation.

Reason for Request and Basis for Use

ASME OM Code Subsection ISTC requires testing of active or passive valves that are required to perform a specific function in shutting down a reactor to the cold shutdown condition, in maintaining the cold shutdown condition, or in mitigating the consequences of an accident. The EFCVs are not required to perform a specific function for shutting down or maintaining the reactor in a cold shutdown condition. Additionally, the reactor instrument lines are assumed to maintain integrity for all accidents

Relief Request – **RV04** (Contd.)

except for the Instrument Line Break Accident (ILBA) as described in Final Safety Analysis Report (FSAR), Subsection 15.6.2. The reactor instrument lines at Columbia Generating Station have a flow-restricting orifice upstream of the EFCV to limit reactor coolant leakage in the event of an instrument line rupture. Isolation of the instrument line by the EFCV is not credited for mitigating the ILBA. Thus, a failure of an EFCV is bounded by the Columbia Generating Station safety analysis. These EFCVs close to limit the flow of reactor coolant to the secondary containment in the event of an instrument line break and as such are included in the IST program at the Owner's discretion and are tested in accordance with the amended Technical Specification SR 3.6.1.3.8.

The GE (General Electric) Licensing Topical Report, NEDO-32977-A dated November 1998 (Reference 2), and associated NRC safety evaluation, dated March 14, 2000, provides the basis for this relief. The report provides justification for relaxation of the testing frequency as described in the amended Technical Specification SR 3.6.1.3.8. The report demonstrates the high degree of EFCV reliability and the low consequences of an EFCV failure. Excess flow check valves have been extremely reliable throughout the industry. Based on 15 years of testing (up to year 2000) with only one (1) failure, the Columbia Generating Station revised Best Estimate Failure Rate is 7.9E-8 per hour; less than the industry average of 1.01E-7 per hour. There have been no failures since year 2000. Technical Specification amendment request for SR 3.6.1.3.8 was reviewed by the NRC staff in safety evaluation (SE) dated February 20, 2001 (Reference 3).

Failure of an EFCV, though not expected as a result of the amended Technical Specification change, is bounded by the Columbia Generating Station safety analysis. Based on the GE Topical report and the analysis contained in the FSAR, the proposed alternative to the required exercise frequency and valve indication verification frequency for EFCVs provide an acceptable level of quality and safety. In Reference 3, the NRC staff concluded that the increase in risk associated with the relaxation of EFCV testing is sufficiently low and acceptable.

Proposed Alternative

Energy Northwest requests relief pursuant to 10 CFR 50.55a(a)(3)(i) to test reactor instrument line excess flow check valves in accordance with the amended Technical Specification SR 3.6.1.3.8. This SR requires verification every 24 months that a representative sample of reactor instrument line EFCVs actuate to the isolation position on an actual or simulated instrument line break signal. The representative sample consists of an approximately equal number of EFCVs such that each EFCV is tested at least once every 10 years (nominal). Valve position indication verification of the representative sample will also be performed during valve testing. Any EFCV failure will be evaluated per the Columbia Generating Station Corrective Action Program.

Duration of Proposed Alternative

Fourth 10 year interval.

Precedents

This relief was granted for the third 10 year interval. NRC approval was documented in a letter dated March 23, 2007 (ADAMS Accession Number ML 070600111, TAC No. MD3552) for Relief Request No. RV05.

Relief Request – **RV04** (Contd.)

References

1. FSAR 15.6.2

2. Letter BWROG-00069, dated June 14, 2000, from W.G. Warren, (BWR Owners Group) to Office of Nuclear Reactor Regulation, "Transmittal of Approved GE Licensing Topical Report NEDO-32977-A, Excess Flow Check Valve Testing Relaxation", dated November 1998

3 Letter GI2-01-017, dated February 20, 2001, Jack Cushing (NRC) to JV Parish (EN), "Columbia Generating station - Issuance of Amendment RE: Technical Specifications Surveillance Requirement 3.6.1.3.8 (TAC NO. MB0421)"

NRC Acceptance/SER Dated December 09, 2014

Relief granted as requested (GI2-14-166).