ATTACHMENT II TO IPN-98-129

INSERVICE TESTING PROGRAM REVISION 6

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

New York Power Authority

Indian Point 3

Procedure Use Is:

☐ Continuous

■ Reference

☐ Information

Control Copy: _____

Effective Date: _____

Page 1 of 75

■ TSR
□ NTSR

PFM-22A Revision: 3

INSERVICE TESTING PROGRAM #6

Robert Dolansky 9/18/98
Writer Date

Reviewer 9/21/98
Date

Approved By:

Procedure Sponsor, DM/Designee 9/24/98
Date

Indian Point 3 Performance

MINOR REVISION

1.0 INTRODUCTION

Revision 6 of the Indian Point (Unit 3) (IP3) ASME Inservice Testing Program Plan will be in effect through the end of the second 120-month (10-year) inspection interval, unless changed for other reasons. The Plan will be updated prior to the start of the third inspection interval in accordance with the requirements of 10 CFR 50.55a(g).

This document outlines the Inservice Testing (IST) Program for IP3 based on the requirements of Section XI of the ASME Boiler and Pressure Vessel Code, 1983 Edition, including Summer, 1983 Addenda. All references to IWP or IWV in this document correspond to Subsections IWP or IWV, respectively, of ASME Section XI, 1983 Edition, unless otherwise noted. Selected portions of ASME/ANSI OM (Parts 6 and 10) have been implemented as discussed in NUREG-1482.

2.0 PROGRAM DEVELOPMENT

ASME B&PV Code, Section XI (hereby referred to as 'the Code') requires that the owner of each nuclear power plant prepare and submit a "plan" for testing and inspection of systems and components under the jurisdiction of the Code and in compliance with Title 10, Part 50 of the Code of Federal Regulations (Para. 50.55.a). With respect to the elements of that plan related to the testing of pumps and valves, Section XI, Subsections IWP and IWV, specifically Paragraphs IWP-1100 and IWV-1100 (as modified by exclusions incorporated by IWP-1200 and IWV-1200), establish the Program scope with the provision that the rules apply to ISI Class 1,2, and 3 as stated by the NRC via Federal Register.

In accordance with the Code, the following are required to be included in the testing Program:

* Centrifugal and positive displacement pumps that are installed in light-water cooled nuclear power plants and provided with an emergency power source and required to perform a specific function in shutting down the reactor or in mitigating the consequences of an accident.

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

In addition to the general Code requirements outlined above, there are other interpretations and positions that have come about as a result of past regulatory and licensee actions.

In light of this, a set of rules was established by which the scope of the Indian Point, Unit 3 ASME Section XI IST Program is determined, including components that are to be included and the extent and type of testing required for each. Based on these rules the philosophy and assumptions used in determining the test requirements for selected pumps and valves was documented.

PFM-22A REV. 3
INSERVICE TESTING PROGRAM #6

Table of Contents

2.1 Initial Program Scope

In the course of developing the Program scope, each of the significant safety systems (included within the ISI-class boundaries) were evaluated with respect to the function of each component and the need for its operability as it relates to the scope of Section XI. Supporting documents used include,

Final Safety Analysis Report (FSAR);
Technical Specifications;
Operational Specifications;
Past program correspondence;
Operating Procedures (Normal,Emergency and Off-Normal);
Plant System Descriptions; and
Design Basis Documents.

The sequence followed during the development effort was as follows:

1) Each of the plant systems was subjected to an overview to determine any potential active safety function as described in the scope statement. Those systems with no obvious safety functions were then excluded from further consideration. Plant documents as well as operating staff inputs were utilized in this phase.

2) For the remaining systems, flow diagrams were studied and any component that could possibly have an active or passive safety function (other than simply maintaining the pressure boundary) were identified for further evaluation.

3) The function of each component identified in 2), above, was determined based on available documentation, staff input or general experience of the evaluator. Testing requirements were derived based on the component function(s) and the applicable rule(s).

4) Available documents were reviewed and specific or implied component operational requirements were compared to the information derived in 3), above.

5) The results of Steps 1) through 4) were reviewed by several knowledgeable members of the plant staff and evaluated for accuracy and consistency. Based on this review, the final program scope was derived and the IST Program Plan developed.

2.2 Program Update

During the test interval it is expected that the scope of the Program will be modified in response to unrelated activities including, but not limited to,

1) Plant design changes;
2) Changes in operating conditions (eg. normal valve lineup);
3) Changes in accident mitigating procedures philosophy;
4) Changes to the Technical Specifications.

As a result, it is expected that the IST Program will be occasionally revised to ensure continued compliance with the Code requirements relating to the scope of the test program.

Maintaining the Program current is accomplished by the IST Coordinator. The review of plant modification packages by the Design Engineering Department includes a review with respect to the IST Program (in accordance with NYPA Modification Control Procedure , MCM-3, "Modification Package Preparation, Review and Approval"). Based on these modification packages and interaction with applicable modification engineers, the IST Coordinator identifies and implements appropriate changes to the IST Program. Revisions to the IST Program are subjected to management reviews and approvals as required by Technical Specification 6.5.0.

2.3 Program Details

Based on the Program scope as established above, the further development of test program details (frequency, practicality, etc.) evolved using selected portions of the following documents:

* Title 10, Code of Federal Regulations, Part 50
* NRC Regulatory Guides - Division 1
* Standard Review Plan 3.9.6, "Inservice Testing of Pumps and Valves"
* Final Safety Analysis Report, Indian Point Unit 3
* Technical Specifications, Indian Point Unit 3
* NRC Safety Evaluation of Indian Point Unit 3 Requests For Relief From Inservice Testing Requirements
* NRC Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs
* NRC Generic Letter 89-04, Supplement 1 - Guidance On Developing Acceptable Inservice Testing Programs
* NUREG-1482 - Guidelines for Inservice Testing at Nuclear Power Plants

The inservice tests called forth in this Plan will verify the operational readiness of pumps and valves which have a specific function in mitigating the consequences of an accident or bringing the reactor to a safe shutdown condition.

3.0 TESTING PROGRAM FOR PUMPS

3.1 General

3.1.1 Code

This IST Program Plan for pumps meets the requirements of Subsection IWP of Section XI of the ASME B&PV Code. Where these requirements are determined to be impractical, specific requests for relief are included in Section 3.2. Selected portions of ASME/ANSI OM (Part 6) have been implemented as discussed in NUREG-1482.

3.1.2 Pump Program Table

Appendix A lists the pumps included in the IST Program. Data contained in this table identifies those pumps subject to inservice testing with the respective inservice test parameters, intervals, and any other applicable remarks.

3.1.3 Allowable Ranges of Test Quantities

The allowable ranges specified in Table IWP-3100-2 will be used for differential pressure, flow, and vibration measurements except as provided for in relief requests. In some cases, the performance of a pump may be adequate to fulfill its safety function even though there may be a measurement that falls outside the allowable ranges as set forth in Table IWP-3100-2. Should this situation occur, an expanded allowable range may be determined, on a case basis, in accordance with IWP-3210 and ASME Code interpretation XI-1-79-19.

3.1.4 Instrumentation

Instrumentation used in the IST Program will generally conform to the requirements of IWP-4000 except where specific relief is requested.

3.1.5 Testing Intervals

The test frequency for pumps in the Program will be as set forth in Appendix A and the associated relief requests. The frequency of "Refueling" is defined as an outage which includes core alterations. A band of +25 percent of the test interval may be applied to the test schedule, as needed, to provide necessary operational flexibility.

3.2 Relief Requests for Pump Testing

The following pages in this section include relief requests PR-1 through PR-18 for IST pump testing.

RELIEF REQUEST NO. PR-1

PUMPS:

Component Cooling; Pump Nos. CCW-31, CCW-32 and CCW-33.
Service Water; Pumps Nos. SWN-31 thru SWN-36.
Residual Heat Removal; Pump Nos. RHR-31 and RHR-32.

TEST REQUIREMENT:

Reference values shall be at points of operation readily duplicated during subsequent inservice testing. (IWP-3110)

BASIS FOR RELIEF:

The component cooling pumps and service water pumps provide cooling to systems where throttling for the purposes of testing can lead to undesirable thermal transients on critical operating equipment. During plant shutdown, throttling residual heat removal flow for testing creates unacceptable core cooling and mixing complications. When the plant is not in a shutdown condition residual heat removal pump testing is performed through a miniflow path at a fixed-resistance reference point.

ALTERNATE TESTING:

During pump reference tests when the pump is known to be operable, a reference pump curve may be established or the manufacturer's pump curve confirmed. In subsequent tests, a flowrate (Qa) will be obtained and recorded along with the corresponding differential pressure (dPa). The differential pressure value (dPa) will then be compared to a reference differential pressure obtained from the reference pump curve using measured flowrate (Qa). Pump curve comparison will be used whenever the component cooling and service water pumps are tested for flowrate and differential pressure. For the residual heat removal pumps curve comparison will be used only when the plant is in a cold shutdown or cooldown configuration. The acceptance criteria of Relief Request No. PR-4 will be applied as appropriate.

RELIEF REQUEST NO. PR-2

PUMPS:

Applicable to all pumps in the Program.

TEST REQUIREMENT:

At least one displacement vibration amplitude (peak-to-peak composite) shall be read during inservice testing. The direction of displacement shall be measured in a plane approximately perpendicular to the rotating shaft, and in the horizontal or vertical direction that has the largest deflection for the particular pump installation. (IWP-4510)

BASIS FOR RELIEF:

Measuring vibration in velocity units rather than displacement is an industry accepted method considered to be more sensitive to small changes that are indicative of developing mechanical problems. Velocity measurements detect not only high-amplitude vibration, characteristic of major mechanical problems, but low-amplitude vibration caused by misalignment, imbalance, or bearing wear.

It is impractical to search for the direction with the largest deflection and procedurally return to that location on successive tests. Also, the direction of maximum deflection may change with pump age and material condition, thus, this is not necessarily a conservative nor proper practice.

ALTERNATE TESTING:

At the option of the plant staff, pump vibration measurements may be taken and trended in either displacement or velocity units. Acceptance criteria for velocity measurements will conform to Table 2.1.

Vibration measurements will be taken in two mutually perpendicular directions in a plane perpendicular to the rotating shaft.

Table 2.1: Allowable Ranges of Vibration Levels (ips)*

Ref. Vib.	Accep. Range	Alert	Action Req.
<0.15	0 - 0.3	0.301 - 0.45	> 0.45
0.15 - 0.3	0 - 0.45	0.451 - 0.7	> 0.7
0.3 - 0.6	0 - 0.7	None	> 0.7
0.6 - 0.7	0 - 0.7	None	> 0.7

* Limits based on ASME Technical Paper 78-WA/NE-5 and ASME/ANSI OMa, Part 6. All units in inches per second (ips)

RELIEF REQUEST NO. PR-3

PUMPS:

Applicable to all pumps in the Program.

TEST REQUIREMENT:

The full-scale range of each instrument shall be three times the reference value or less. (IWP-4120)

BASIS FOR RELIEF:

The commercially available instruments used for measuring pump vibration do not provide range selections that guarantee adherence to the range limitations per Subsubarticle IWP-4120.

The accuracy of instrumentation used to measure vibration is generally based on the actual measured value and is unrelated to the range of the instrument.

ALTERNATE TESTING:

Vibration measurements will be taken with commercially available instruments and, while taking measurements, the instrument range selection will be set at the lowest possible scale that includes the level of vibration.

RELIEF REQUEST NO. PR-4

PUMPS:

Applicable to all pumps in the Program.

TEST REQUIREMENT:

The allowable ranges of inservice test quantities in relation to the reference values are tabulated in Table IWP-3100-2. This table limits the acceptable performance of each pump dependent variable (flowrate or differential pressure) to a maximum of 102 percent of the respective reference value for the alert condition and 103 percent for the action required range. If the test parameter should exceed these limits, the subject pump shall be tested at more frequent intervals for the alert range or declared inoperative and removed from service if the test parameter should fall in the action required range. (IWP-3200)

BASIS FOR RELIEF:

The requirement to declare a pump inoperative when a test parameter (flowrate or differential pressure) exceeds the reference value by 3 percent is not technically justified, sound engineering judgement, nor acceptable plant operating practice for the following reasons:

* Indiscriminately declaring safety system pumps inoperative could result in excessive and unneeded testing of other plant safeguard systems and components. Such testing could ultimately detract from the overall reliability of plant safety systems. In addition, unwarranted testing unnecessarily adds to the burden of the operating staff and dilutes efforts focused on the performance of their primary duties. Such testing also results in unnecessary radiation exposure.

* The case where a test parameter exceeds the reference value does not indicate pump degradation. It may merely signify that the reference value is probably on the lower side of the statistical scatter of the test data and the specific test in question is on the upper side. Note that the reference values are subject to the same elements of statistical error associated with any other individual test.

* The 3-percent limitation is overly restrictive when compared to the accuracy of the instrumentation used to gather the test data as required by Paragraph IWP-4110 (+/-2 percent).

* Power plant operating systems are not configured in a manner that provides the accuracy and precision needed to consistently and reliably provide the repeatability required to meet the requirements implied by the 3 percent restriction.

* This requirement provides no apparent additional measure of reliability to the equipment.

ALTERNATIVE TESTING:

The acceptance criteria of Table IWP-3100-2 will be utilized, unless otherwise noted, with the following exceptions:

a) The Required-Action Range (HIGH) will be greater than 110 percent of the reference value for test quantities of flowrate and differential pressure, and

b) The Alert-range (HIGH) will be 105 to 110 percent of the reference value for test quantities of flowrate and differential pressure.

RELIEF REQUEST NO. PR-5

PUMPS:

Applicable to all pumps in the Program.

TEST REQUIREMENT:

The temperature of all pump bearings outside the main flowpath shall be measured at points selected to be responsive to changes in the temperature of the bearings. (IWP-4310)

BASIS FOR RELIEF:

Many of the bearings of the centrifugal pumps included in the IP3 IST Program are water cooled -- cooling water supplied from the flowstream or auxiliary closed cooling water systems. Thus, bearing temperature measurements are highly dependent on the temperature of the cooling medium and not necessarily indicative of bearing condition.

The data associated with bearing temperatures taken at one-year intervals provides little statistical basis for determining the incremental degradation of a bearing or any meaningful trending information or correlation.

Vibration measurements are a significantly more reliable indication of an imminent or existing bearing failure. It is highly unlikely that such a condition would go unnoticed during routine pump operation or surveillance testing. Other indications of bearing problems include audible noise, reduced pump performance, seal failure, unusual vibration, increased motor current, etc. This is also supported by the elimination of this requirement in the recent version of ASME/ANSI OM-1987 - Operation and Maintenance of Nuclear Power Plants

The gain from taking bearing measurements, which in most cases must be done locally using portable instruments, cannot offset the cost in terms of dilution of resources, distraction of operators from other primary duties, excessive operating periods for normally idle pumps, and personnel radiation exposure.

ALTERNATIVE TESTING:

None

RELIEF REQUEST NO. PR-6

PUMPS:

Applicable to all pumps in the Program.

TEST REQUIREMENT:

Measure pump inlet pressure before starting the pump and during the test. (Table IWP-3100-1)

BASIS FOR RELIEF:

If the pumps being tested are in operation as a result of plant or system needs, it is unreasonable and impractical to reconfigure system lineups simply to provide for measurement of the static inlet pressure.

Inlet pressure prior to pump startup is not a significant parameter needed for evaluating pump performance or material condition.

ALTERNATE TESTING:

When performing a test on a pump that is already in operation due to system requirements, inlet pressure will only be measured during pump operation.

RELIEF REQUEST NO. PR-7

PUMPS:

Service Water; Pump Nos. SWN-31 thru SWN-36
Recirculation Sump; Pump Nos. REC-31 and REC-32

TEST REQUIREMENT:

Measure pump inlet pressure before starting the pump and during the test. (Table IWP-3100-1)

BASIS FOR RELIEF:

These pumps are submerged and, as such, have inlet pressures corresponding to the water level at the intake, or in the case of the recirculation pumps, the water level in the recirculation sump. Also, because of this, suction pressure is virtually independent of pump operation and will remain relatively constant during the test.

ALTERNATE TESTING:

Inlet pressure will be calculated from the height of water above the pump suction.

Only one inlet pressure calculation per pump test will be made.

RELIEF REQUEST NO. PR-8

[WITHDRAWN]

RELIEF REQUEST NO. PR-9

PUMPS:

Recirculation Sump; Pump Nos. REC-31 and REC-32

TEST REQUIREMENT:

An inservice test shall be run on each pump nominally every 3 months during normal plant operation. (IWP-3400)

BASIS FOR RELIEF:

Testing these pumps during operation is impractical since they are located inside containment and are maintained in a dry condition.

During a typical non-refuel outage, the extent of the preparations required and the length of time needed for testing these pumps would significantly affect plant availability and, thus, such testing is considered impractical. This testing would also create approximately 5,000 gallons of contaminated waste water which would require processing through the radioactive waste processing systems.

Since these pumps stand idle and dry except for periods of testing, significant inservice degradation is unlikely.

ALTERNATE TESTING:

The Recirculation Sump Pumps will be tested every 2 years during testing required by Technical Specification 4.5.B.1.a.

NOTE: A revision to Technical Specification 4.5.B.1.a to extend Recirculation Pump testing from 18 months to 2 years has been approved. Therefore the inservice testing frequency will be 2 years as well.

RELIEF REQUEST NO. PR-10

PUMPS:

Turbine-Driven Auxiliary Feedwater Pump No. AFW-32

TEST REQUIREMENT:

An inservice test shall be run on each pump nominally every 3 months during normal plant operation. (IWP-3400)

Pump testing shall be based on establishing a set of reference values, then comparing subsequent test results to these reference values. Inherent in this is the requirement to determine which of the pump parameters (flowrate or differential pressure) is to be the independent variable, then, in subsequent tests, this parameter is set to the reference value by adjusting system resistance. The value obtained for the dependent variable is compared to its respective reference value with Table IWP-3100-2 establishing acceptance criteria. During the test, the test quantities shown in Table IWP-3100-1 shall be measured and recorded. (IWP-3100 & 3110)

BASIS FOR RELIEF:

During normal plant operation no full-flow test loop is available for this pump. Consequently, the only practical method of testing is to circulate water through the minimum flow line; however there is no flow measuring instrumentation in the minimum flow circuit.

Since these pumps stand idle, except for periods of testing, significant inservice degradation is unlikely.

ALTERNATE TESTING:

This pump will be tested quarterly with the fixed resistance of the minimum flow line. During these tests, all appropriate pump operational parameters will be measured and evaluated with respect to Table IWP-3100-2 and associated relief requests with the exception of flowrate.

Every 2 years the #32 Auxiliary Feedwater Pump will be tested under nominal full-flow conditions during pump testing required by Technical Specification 4.8.1.a. All required measurements of parameters will be taken and evaluated in accordance with Table IWP-3100-2. This agrees with the guidance provided in NRC Generic Letter 89-04, Position 9.

RELIEF REQUEST NO. PR-11

PUMPS:

Safety Injection; Pumps Nos. SIS-31 thru 33
Containment Spray; Pumps Nos. CS-31 and CS-32
Recirculation Sump; Pumps Nos. REC-31 and REC-32

TEST REQUIREMENT:

If deviations (in pump test measurements) fall within the Alert range of Table IWP-3100-2, the frequency of testing specified in IWP-3400 shall be doubled until the cause of the deviation is determined and the condition corrected. (IWP-3230(a))

BASIS FOR RELIEF:

To meet the requirements as stated, should a pump test result in the pump entering the Alert range, the plant would be required to enter into a shutdown merely to test the affected pump. In the case of a refueling test, the preparations for such a test would be impractical.

Since these pumps normally stand idle, except for periods of testing, significant inservice degradation is unlikely.

ALTERNATE TESTING:

Cold Shutdown Testing - If, during cold shutdown testing of a pump, the test results should place that pump in alert status, the test results will be evaluated to ensure that the pump is fully operable and not significantly degraded. Subsequently, while in alert status, the subject pump will be tested only during cold shutdown periods on a frequency determined by the intervals between shutdowns as follows:

* for intervals of 45 days or longer, tests will be performed during each shutdown;

* for intervals of less than 45 days, testing will not be performed unless, by the end of the outage, 45 days will have passed since the last test of that particular pump.

Refueling Testing - If during testing of a pump that is only tested at a refueling outage the test results should place that pump in Alert status, the test results will be evaluated to ensure that the pump is fully operable and has not suffered any significant degradation. The frequency of testing for that particular pump will not be altered (eg. increased).

RELIEF REQUEST NO. PR-12

[WITHDRAWN]

RELIEF REQUEST PR-13

[WITHDRAWN]

RELIEF REQUEST PR-14

[WITHDRAWN]

RELIEF REQUEST NO. PR-15

PUMPS:

All pumps in the Program

TEST REQUIREMENT:

If the presence or absence of liquid in a gage line could produce a difference of more than 0.25% in the indicated value of the measured pressure, means shall be provided to ensure or determine the presence or absence of liquid as required for the static correction used. (IWP-4210)

BASIS FOR RELIEF:

When this requirement is applied to the measurement of pump suction pressure where measured pressures are at relative low levels, the 0.25% limit is overly restrictive and oftentimes results in complicated venting procedures and unnecessary health physics risks associated with handling and disposal of radioactive contaminated water with no commensurate gain or improvement of test reliability.

Normally, the only quantitative use of suction pressure measurements, where significant accuracy is required, is in determining pump differential pressure or head. In most cases the pump discharge pressure exceeds the suction pressure by at least a factor of five (5). This being the case, a .25% error introduced into the suction pressure measurement results in an error of .05% in the differential pressure calculation. This is insignificant in light of the potential 6% error allowance applied to both the suction and discharge pressure instruments (Ref IWP-4110).

ALTERNATE TESTING:

If the presence or absence of liquid in a gage line used for sensing pump suction pressure could produce a difference of more than 0.25% in the calculated value of the pump differential pressure, means shall be provided to ensure or determine the presence or absence of liquid as required for the static correction used.

RELIEF REQUEST NO. PR-16

[WITHDRAWN]

RELIEF REQUEST NO. PR-17

[WITHDRAWN]

RELIEF REQUEST NO. PR-18

PUMPS:

SIS Pump Circulating Water; Pump Nos. ACC-CW-31 thru ACC-CW-33

TEST REQUIREMENT:

Reference values shall be at points of operation readily duplicated during subsequent inservice testing. (IWP-3110)

BASIC FOR RELIEF:

In order to ensure that cooling water flow is supplied to the Safety Injection pumps during an SI actuation concurrent with a blackout event, these pumps were supplied with attached shaft driven centrifugal pumps. These SI-CCW Pumps supply cooling water flow to Safety Injection Pump support services (i.e., SI shaft seals, stuffing box and lube oil coolers). In order to ensure that each Lube Oil Cooler receives adequate flow, a pre-operational test was performed to flow balance the system. As a result of the flow balance tests, the Component Cooling return from the SI Pump Cooler outlet isolation valve must be throttled. Once these valves are set/throttled, the less they are adjusted and reset, the more reliable the final valve positions would reflect the original flow balance required positions.

In order to strictly adhere to the ASME Section XI IST code requirements to test the SI-CCW pumps at a fixed flow each time, valves which are throttled to required positions due to flow balance concerns need to be adjusted. In order to minimize the need to adjust these valves, the IST test allows for the measured pump flow to vary over a small range of the pump curve to allow for expected variations in system alignments/operating conditions from test to test. In developing the pump curve used in the test, the following elements were used:

1. The manufacturer's pump curves were validated when the pumps were known to operate acceptably. The data used originated from the Modification Acceptance Test after pump installation.

2. The instruments used during the Modification Acceptance Test either met or exceeded the Code required accuracy.

3. 18 points from the manufacturer's curve were used to construct the pump reference curve, however only 4 of the points cover the tested flow range which is considered acceptable due to the narrow test range. The full pump curve ranges from 0 to 85 GPM while the test curve ranges from 20 to 35 GPM.

4. The constructed curve uses a narrow flow range which encompasses the normally expected flow observed from the Modification Test.

5. The acceptance criteria established does not conflict with the operability criteria for flow rate and differential pressure in technical specifications or the facility safety analysis report.

6. Review of the vibration data trend plots indicates that the change in vibration readings over the narrow range of the pump curves being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

RELIEF REQUEST NO. PR-18 (conti)

7. After any maintenance or repair that may affect the existing reference pump curve, a new reference pump curve shall be determined or the existing pump curve revalidated by an inservice test.

ALTERNATE TESTING:

During pump reference tests when the pump is known to be operable, a reference pump curve may be established or the manufacturer's pump curve confirmed as discussed in the Basis For Relief. In subsequent tests, a flowrate (Qa) will be obtained and recorded along with the corresponding differential pressure (dPa). The differential pressure value (dPa) will then be compared to a reference differential pressure obtained from the reference pump curve using measured flowrate (Qa).

4.0 TESTING PROGRAM FOR VALVES

4.1 General

4.1.1 Code

This IST Program Plan for valves meets the requirements of Subsection IWV of Section XI of the ASME B&PV Code. Where these requirements are determined to be impractical, specific requests for relief are included in Section 4.2. Selected portions of ASME/ANSI OM (Part 10) have been implemented as discussed in NUREG-1482.

4.1.2 Valve Program Table

Appendix B lists the valves included in the IST Program. Data contained in this table identifies those valves subject to inservice testing with the respective descriptive information, test requirements, test intervals, and applicable remarks and references to relief requests.

4.1.3 Deferred Testing

When one valve in a redundant system is determined to be inoperable, non-redundant valves in the other train may not be tested, as required by procedures and this Program, but may be exercised after the inoperable valve is returned to service.

4.1.4 Testing Intervals

The test frequency for valves in the Program will be as set forth in Appendix B and associated relief requests. The frequency of "Refueling" is defined as an outage which includes core alterations. An allowable band of +25 percent of the test interval may be applied to the testing schedule, as needed, to provide necessary operational flexibility.

4.1.5 Cold Shutdown Testing

For those valves designated to be tested during cold shutdown, testing will commence within 48 hours after reaching the cold shutdown condition as defined in the IP3 Technical Specifications. Testing not completed before startup may be completed during subsequent cold shutdown outages. Valve testing need not be performed more often than once every three (3) months. In the case of an extended cold shutdown, the testing need not be started within 48 hours; however, in this instance all valves must be tested prior to startup.

4.1.6 Position Indication Testing

For those valves with remote position indicators, tests will be performed to ensure the indication correctly reflects actual valve position in accordance with the requirements of IWV-3300.

4.1.7 Fail-Safe Testing

When the normal methods for exercising power-operated valves also tests the fail-safe functions of these valves, no additional testing is required.

4.1.8 Stroke Time Evaluation

Where stroke time measurement of power-operated valves is required, maximum allowable stroke times will be established based on test history, manufacturer's specifications, FSAR analyses, technical specifications, and engineering judgement. Generally, the most limiting value will determine the limit. Measured stroke times will be evaluated and corrective actions taken in accordance with IWV-3417 except where relief is granted.

4.1.9 Check Valve Disassembly

When a check valve is disassembled in lieu of exercising (in accordance with an approved relief request), the inspection shall include verification of freedom of motion. In addition, prior to returning a check valve to service following disassembly, it will be subjected to a partial flow test.

4.2 Relief Requests for Valve Testing

The following pages in this section include relief requests VR-1 through VR-50, for IST valve testing.

RELIEF REQUEST NO. VR-1

SYSTEMS:

All systems

VALVES:

Various

CATEGORIES:

A and B

FUNCTIONS:

Various

REQUIREMENT:

If, for power-operated valves, an increase in stroke time of 50% or more for valves with full-stroke times less than or equal to 10 seconds is observed, test frequency shall be increased to once each month until corrective action is taken, at which time the original test frequency shall be resumed. (IWV-3417(a))

BASIS FOR RELIEF:

The stroke time measurements taken during exercising of fast-acting valves (those less than 2 seconds) are subject to considerable variation due to conditions unrelated to the material condition of the valve (eg. test conditions, operator reaction time). In accordance with NRC Generic Letter 89-04, Position 6, an alternate method of evaluating stroke times is acceptable.

ALTERNATE TESTING:

The stroke time evaluation for those valves designated as fast-acting will not account for successive increases of measured stroke time. In lieu of this, the assigned maximum limiting value of stroke time will be established at 2 seconds. Upon exceeding the 2-second limit, a valve will be declared inoperable and corrective action taken in accordance with IWV-3417(b).

RELIEF REQUEST NO. VR-2

[WITHDRAWN]

RELIEF REQUEST NO. VR-3

SYSTEM:

Condensate and Boiler Feed (Dwg. No. ISI-20183)

VALVE:

CT-29-2

CATEGORY:

C

FUNCTION:

This valve opens to provide a flowpath from the condensate storage tank to the turbine-driven auxiliary feedwater pump.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

During power operation, exercising this valve to the full-open position would require operating the steam-driven auxiliary feedwater pump injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles which is highly undesirable.

During a normal cold shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. Thus, since operation of this pump is the only practical way of exercising this valve to the full-open position, cold shutdown testing is impractical.

ALTERNATE TESTING:

During quarterly testing of the turbine-driven auxiliary feedwater pump this valve will be partial-stroke tested via the minimum flow recirculation line.

Every 2 years this valve will be full stroke exercised, during #32 Auxiliary Feedwater Pump full testing required by Technical Specification 4.8.1.a.

RELIEF REQUEST NO. VR-4

[WITHDRAWN]

RELIEF REQUEST NO. VR-5

SYSTEM:

Boiler Feedwater (Dwg. No. ISI-20193)

VALVES:

BFD 31
BFD 47-1 thru BFD 47-4

CATEGORY:

C

FUNCTION:

These valves open to provide flowpaths from the discharge of the turbine-driven auxiliary feedwater pump to the steam generators. Valves BFD 47-1 through BFD 47-4 close to prevent backflow through the idle pump when either of the motor-driven pumps is in operation. BFD-31 has no safety function in the closed position.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

During power operation, exercising these valves (open) would require operating the steam-driven auxiliary feedwater pump and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles which is highly undesirable.

During a normal cold shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. Thus, since operation of this pump is the only practical way of exercising these valves, cold shutdown testing is impractical.

Verifying closure of valves BFD-47-1 thru BFD-47-4 requires the operation of at least one of the motor-operated AFW pumps with injection to the steam generators. As discussed above, this is not practical during normal plant operation at power.

ALTERNATE TESTING:

During cold shutdown periods, valves BFD 47-1 through BFD 47-4 will be verified to be closed.

During cold shutdown periods, BFD-31 and BFD-47-1 through BFD-47-4 will be partial-stroke exercised to the open position.

Every 2 years BFD-31 and BFD-47-1 through BFD-47-4 will be exercised to the fully open position during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump #32 full flow testing.

RELIEF REQUEST NO. VR-6

SYSTEM:

Instrument Air (Dwg. No. ISI-20363)

VALVES:

IA-39
PCV-1228

CATEGORIES:

IA-39 - A/C
PCV-1228 - A

FUNCTION:

These valves are the containment isolation valves for the instrument air supply to the containment building.

REQUIREMENTS:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

Category A valves shall be exercised at least once every 3 months, except as provided by IWV-3412(a), IWV-3415, and IWV-3416. (IWV-3411)

Valves with fail safe actuators shall be tested by observing the operation of the valves upon a loss of actuator power once every three months. (IWV-3415)

BASIS FOR RELIEF:

Exercising these valves during operation or cold shutdown requires isolating the instrument air supply to the containment building. This would cause multiple failures of instrumentation and equipment within the containment with accompanying system and plant transients, depending on the status of the reactor plant. In addition, the only positive means of verifying valve closure of IA-39 is to perform a leakage test, which is impractical during a short duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing valve IA-39 during refueling outages.

ALTERNATE TESTING:

Every 2 years PCV-1228 and IA-39 will be exercised, and closure of IA-39 will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33). Fail safe testing for PCV-1228 will be performed every two years.

RELIEF REQUEST NO. VR-7

SYSTEM:

Waste Disposal (Dwg. No. ISI-27193)

VALVE:

1616

CATEGORY:

A/C

FUNCTION:

This valve is the containment isolation valve for the nitrogen supply to the reactor coolant drain tank.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Exercising this valve during operation or cold shutdown requires access to the containment building (downstream vent path lineup is in the containment building) and performance of a leakage test, which is impractical during operation or a short duration maintenance outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

ALTERNATE TESTING:

Every 2 years 1616 will be exercised, and closure will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-8

SYSTEM:

Auxiliary Coolant (Dwg. No. ISI-27203)

VALVE:

741

CATEGORY:

A/C

FUNCTION:

This valve opens to provide a flowpath from the RHR pumps to the RHR heat exchangers and closes for containment isolation.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Verifying closure of this valve during operation or cold shutdown requires access to the containment building and performance of a leakage test, which is impractical during operation or a short-duration maintenance outage. In addition, closure testing requires interruption of shutdown cooling which is also impractical during cold shutdown.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

ALTERNATE TESTING:

Every 2 years 741 will be exercised, and closure will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-9

[WITHDRAWN]

RELIEF REQUEST NO. VR-10

SYSTEM:

Nitrogen to Nuclear Equipment (Dwg. No. ISI-27233)

VALVE:

NNE-1610

CATEGORY:

A/C

FUNCTION:

This valve is the inboard containment isolation valve for the nitrogen supply to the containment building.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

The only positive means of verifying valve closure is to perform a leakage test, which is impractical during plant operation or a short-duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

ALTERNATE TESTING:

Every 2 years NNE-1610 will be exercised, and closure will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-11

[WITHDRAWN]

RELIEF REQUEST NO. VR-12

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

857 A-H,J-N,P-U, and W

CATEGORY:

A/C

FUNCTION:

These valves provide isolation of the high-head SIS injection system and a flowpath into the reactor coolant loops.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

These valves cannot be exercised during plant operation since the safety injection pumps cannot develop sufficient head to open them against normal operational reactor coolant system pressure.

During cold shutdown, exercising these valves would require operation of the safety injection pumps and injection into the reactor coolant loops. This has the potential of causing low-temperature over-pressurization of the RCS.

ALTERNATE TESTING:

During each reactor refueling outage these valves will be full-stroke exercised.

Every 2 years valve closure will be verified during Technical Specification 4.5.B.2.c leakage testing (also see Relief Request VR-29).

NOTE: A revision to Technical Specification 4.5.B.2.c to extend valve leakage testing from 18 months to 2 years has been approved. Therefore the closure verification testing frequency will be 2 years as well.

RELIEF REQUEST NO. VR-13

[WITHDRAWN]

RELIEF REQUEST NO. VR-14

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

886A and 886B

CATEGORY:

C

FUNCTION:

These valves are installed at the discharge of each recirculation sump pump to prevent backflow through an idle pump.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

This system remains drained during all modes of operation except refueling outages when water is provided to test the recirculation pumps. Because there is no full-flow test line, during these tests a minimal amount of water is recirculated to the sump. This flowrate is capable of only partially stroking the discharge valves.

Because these valves are never operated except for pump testing each refueling and they are maintained in a dry condition, there is a low probability of deterioration.

ALTERNATE TESTING:

Every 2 years the 886A and 886B valves will be partial stroke exercised in the open direction during Technical Specification 4.5.B.1.a Recirculation Pump testing.

Every 2 years the 886A and 886V valves will be full stroke exercised in the closed direction during Technical Specification 4.5.B.1.a Recirculation Pump testing.

NOTE: A revision to Technical Specification 4.5.B.1.a to extend Recirculation Pump testing from 18 months to 2 years has been approved. Therefore the partial stroke testing frequency will be 2 years as well.

During every reactor refueling outage, one of these valves will be disassembled, inspected, and manually exercised to verify operability. The schedule will be rotated such that valves are inspected during successive outages. During these inspections, should a disassembled valve prove to be inoperable (ie. incapable of performing its safety function), then, during the same outage, the other valve will be disassembled, inspected, and exercised to verify operability.

RELIEF REQUEST NO. VR-15

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

889A and 889B

CATEGORY:

B

FUNCTION:

These valves isolate the containment spray headers from the RHR heat exchangers during normal operation and open to supply cooled water as required during containment spray operation.

REQUIREMENT:

Category B Valves shall be exercised at least once every 3 months, except as provided by IWV-33412(a), IWV-3415, and IWV-3416. (IWV-3411)

Valves with remote position indication shall be observed at least once every 2 years to verify valve operation is accurately indicated. (IWV-3300)

BASIS FOR RELIEF:

During normal plant operation, opening these valves shifts the low head safety injection flow from the reactor coolant system to the containment spray headers; thus, while either of these valves is open, the low-head safety injection system is considered to be inoperable.

During a typical short-duration outage, the RHR heat exchangers are in operation. While in the shutdown cooling mode, the containment spray headers must be isolated from the heat exchangers to preclude discharging water into the containment.

ALTERNATE TESTING:

These valves will be exercised and remote position indication verified during each reactor refueling outage.

RELIEF REQUEST NO. VR-16

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

895A thru 895D

CATEGORY:

A/C

FUNCTION:

These valves open to provide safety injection flow into the reactor coolant system cold legs and close to provide pressure isolation between the reactor coolant system and the safety injection accumulators.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Exercising these valves to the open position requires actuation of safety injection and overcoming the pressure of the reactor coolant system. This cannot be done during normal plant operation since the maximum accumulator pressure is considerably less than that of the reactor coolant system.

Testing during cold shutdown - Full stroking (open) of these valves would require "blowing-down" a pressurized accumulator into a de-pressurized reactor coolant loop. Due to the scope of such an evolution, performance during a cold shutdown availability is not practical. Furthermore, the slow speed of the accumulator discharge isolation valves (894 A-D) it is unlikely that full flow can be achieved in this line.

During cold shutdown, partial stroke testing can be accomplished by blowing down a slightly pressurized accumulator. A partial-stroke test followed by a leakrate test adequately ensures that a valve of this type is intact and functioning properly. Any significant deterioration of the valve internals will be discovered during the leaktest.

ALTERNATE TESTING:

During each cold shutdown each valve will be partial-stroke tested followed by a leakage test required by Technical Specification 4.5.B.2.d.

During each reactor refueling outage, nonintrusive techniques will be used to verify full stroke testing in accordance with NUREG-1482, Section 4.1.2.

RELIEF REQUEST NO. VR-17

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

897A thru 897D

CATEGORY:

A/C

FUNCTION:

These valves supply make-up from the RHR/low head safety injection pumps or the safety injection accumulators to the RCS cold legs and isolate those components from RCS pressure during normal plant operation.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Neither the RHR/low head safety injection pumps nor the safety injection accumulators can provide enough pressure to overcome RCS pressure; thus, exercising these valves during plant operation is not possible.

Testing during cold shutdown - initiating safety injection by means of the SIS accumulators presents a potential safety hazard due to the chance of causing low-temperature over-pressurization of the reactor coolant system. The only practical means of verifying valve closure is by performing a leakrate test which is not generally practical during plant operation.

Full-stroke testing of these valves by disassembly and inspection during a refueling outage is a major evolution requiring draining the reactor vessel and mid-loop operation or defueling. This results in a considerable impact the outage schedule for little or no apparent gain in either plant safety or reliability. A partial-stroke test followed by a leak rate test adequately ensures that a valve of this type is intact adn functioning properly. Any significant deterioration of the valve internals will likely be discovered during a leak test.

ALTERNATE TESTING:

During each cold shutdown each valve will be partial-stroke tested followed by a leakage test required by Technical Specification 4.5.B.2.d. Note that partial-stroke refers to the flow required by injection via the SIS accumulators; the valves are actually full-flow tested with respect to that associated with the RHR and low-head injection functions.

During each reactor refueling outage, noninstrusive techniques will be used to verify full stroke testing in accordance with NUREG-1482, Section 4.1.2.

RELIEF REQUEST NO. VR-18

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVES:

1802A and 1802B

CATEGORY:

B

FUNCTION:

These valves close to isolate the recirculation pumps from the remainder of the RHR system and open to provide a recirculation flowpath to the RHR heat exchangers.

REQUIREMENT:

Category B valves shall be exercised at least once every 3 months, except as provided by IWV-3412(a), IWV-3415, and IWV-3416.

Valves with remote position indication shall be observed at least once every 2 years to verify valve operation is accurately indicated. (IWV-3300)

BASIS FOR RELIEF:

Exercising these valves during plant operation would result in draining the RHR system piping to the containment sump.

During a normal cold shutdown maintenance outage when the RHR system is in operation, the potential for draining the RHR system water inventory into the recirculation sump makes this an undesirable operation.

ALTERNATE TESTING:

These valves will be exercised and remote position indication verified during each refueling outage.

RELIEF REQUEST NO. VR-19

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVE:

1820

CATEGORY:

C

FUNCTION:

This valve opens to provide a pathway for minimum flow from the containment recirculation pumps.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

This system is normally maintained in a dry condition except during testing of the recirculation pumps which is performed during refueling outages. This precludes pump operation during plant operation that is required for testing of this valve.

The test circuit for testing of the recirculation pumps does not contain permanently installed instrumentation for measuring flow through this valve needed to satisfy NRC Generic Letter 89-04.

Because these valves are never operated except for pump testing each refueling and they are maintained in a dry condition, there is a low probability of deterioration.

ALTERNATE TESTING:

Every 2 years the 1820 valve will be full stroke exercised during Technical Specification 4.5.B.1.a Recirculation Pump testing.

NOTE: A revision to Technical Specification 4.5.B.1.a to extend Recirculation Pump testing from 18 months to 2 years has been approved. Therefore the full stroke testing frequency will be 2 years as well.

RELIEF REQUEST NO. VR-20

SYSTEM:

Reactor Coolant (Dwg. No. ISI-27473)

VALVE:

518

CATEGORY:

A/C

FUNCTION:

This valve provides a pathway for nitrogen to the pressurizer relief tank and acts as a containment isolation valve.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

The only positive means of verifying valve closure is to perform a leakage test which is impractical during a short-duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

ALTERNATE TESTING:

Every 2 years valve 518 will be exercised, and closure will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-21

SYSTEM:

Safety Injection (Dwg. No. ISI-27503)

VALVE:

847

CATEGORY:

C

FUNCTION:

This valve opens to provide a pathway for water from the refueling water storage tank to the suction of the safety injection pumps.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Testing this valve with full accident flow will require injection through both pathways (including through the BIT) using two high-head safety injection pumps operating simultaneously. There is no other full-flow test loop for the safety injection pumps that would provide sufficient flow to verify that this valve is fully opened.

During plant operation this is not possible since the head of the safety injection pumps is insufficient to overcome reactor pressure. While in cold shutdown, provisions related to low-temperature over-pressurization concerns preclude safety injection pump operation.

ALTERNATE TESTING:

This valve will be partial-stroke exercised quarterly with minimum flow. During each reactor refueling outage, this valve will be disassembled, inspected, and manually exercised to verify operability. R

RELIEF REQUEST NO. VR-22

SYSTEM:

Safety Injection (Dwg. No. ISI-27503)

VALVES:

849A and 849B
852A and 852B

CATEGORY:

C

FUNCTION:

849A and 852A These valves open to provide a pathway for water from the discharge of the safety injection pumps directly to the RCS. They close to prevent backflow through an idle pump.

849B and 852B These valves open to provide a pathway for water from the discharge of the safety injection pumps to the RCS via the boron injection tank. They close to prevent backflow through an idle pump.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Full or partial stroke exercising of these valves requires operation of the safety injection pumps and injection into the reactor coolant system either through the boron injection tank (849B and 852B) or directly (849A and 852A). During plant operation, testing is not possible because the SIS pumps cannot develop sufficient head to overcome the RCS pressure. In cold shutdown condition, operation of the SIS pumps in this mode could potentially result in low temperature over-pressurization of the RCS.

ALTERNATE TESTING:

Valves 849 A&B and 852 A&B will be partial-stroke exercised (open) quarterly and full-stroke exercised during each reactor refueling outage.

RELIEF REQUEST NO. VR-23

SYSTEM:

Safety Injection (Dwg. No. ISI-27503)

VALVES:

867A and 867B

CATEGORY:

A/C

FUNCTION:

These valves open to provide pathways for water from the discharge of the containment spray pumps to the containment spray headers. The valves close to prevent backflow through an idle pump and to provide containment isolation.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

The only test circuit to provide sufficient flow needed for full-stroke exercising of these valves without spraying water into the containment building is while filling the refueling cavity prior to refueling. Spool pieces are installed to redirect the containment spray pump discharge flow to the alternate fill line for the cavity fill. The fill line has orifices installed which limit the flow to values approximately similar to the spray requirements.

In order to verify valve closure a leakage test must be performed.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing these valve during refueling outages.

ALTERNATE TESTING:

These valves will be partial-stroke exercised (open) quarterly.

The subject valves will be full-stroke exercised open during each refueling outage.

Every 2 years the 867A and 867B valves will be exercised, and closure will be verified during Technical Specification 4.4.E.1 containment isolation valve leakage testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-24

SYSTEM:

Safety Injection (Drawing No. ISI-27503)

VALVE:

881

CATEGORY:

C

FUNCTION:

This valve opens to provide a pathway for water from the refueling water storage tank to the suction of the residual heat removal pumps.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

There is no full flow test circuit to provide sufficient flow needed for full-stroke exercising of this valve during normal plant operation.

In cold shutdown, the RHR pumps are used for residual heat removal and there is insufficient letdown capability to recirculate to the RWST, thus, testing this valve is not practical.

ALTERNATE TESTING:

This valve will be partial-stroke exercised quarterly.

The subject valve will be full-stroke exercised during each reactor refueling outage.

RELIEF REQUEST NO. VR-25

[WITHDRAWN]

RELIEF REQUEST NO. VR-26

[WITHDRAWN]

RELIEF REQUEST NO. VR-27

[WITHDRAWN]

RELIEF REQUEST NO. VR-28

[WITHDRAWN]

RELIEF REQUEST NO. VR-29

SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

VALVE:

857A, 857G, 857Q, 857R, 857S, 857T, 857U and 857W

CATEGORY:

A/C

FUNCTIONS:

These valves provide a flow path for the high-head safety injection system to the reactor coolant loops and prevent over-pressurization of the safety injection system piping and components.

REQUIREMENTS:

Category A valves shall be leak tested per IWV-3420.

BASIS FOR RELIEF:

The Indian Point 3 Technical Specifications, Section 4.5.B.2.c, requires leak testing of these check valves due to the potential of over-pressurization of the safety injection system (Event V scenario). To ensure that this does not occur, and in accordance with NRC letter dated February 1980, Subject: Event V Scenario, only two valves in series require testing. Due to difficulties with testing a single valve in these cases, it has been decided to test the inner valve individually and the outer two valves as a pair (considering the inner valve as a barrier and the outer two as a barrier). This relief applies only to the outer two valves which will be tested as a pair due to the man rem exposure levels associated with performing the test. The valves, which are in a high heat and radiation environment, require a difficult series of making and breaking connections to "jumper" high pressures over the inner check valve(s). The two barriers (one inner check valve and two outer check valves) are to be provided with individual leak tests.

ALTERNATE TESTING:

These valve pairs will be leak tested as a pair with the resulting leakrate evaluated as if a single valve were tested. The inner check valves in each of the four flow paths from the reactor coolant system (897A, 897B, 897C, and 897D) will be individually leak tested.

RELIEF REQUEST NO. VR-30

[WITHDRAWN]

RELIEF REQUEST NO. VR-31

SYSTEM:

Personnel Airlock/Equipment Hatch

VALVES:

CB-1
CB-2
CB-5
CB-6

CATEGORY:

A/C

FUNCTION:

These valves are in the personnel and equipment hatch equalizing lines.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

Category A valves shall be leaktested per IWV-3420.

BASIS FOR RELIEF:

The only positive means of verifying closure of these valves is to perform a leakage test, which is impractical during plant operation or a short-duration outage.

These valves are containment isolation valves that are installed in two pairs (CB-1 & CB-2 and CB-5 & CB-6) in series with no test connections between them. This precludes individually leak testing or exercising each valve. In this configuration, only one valve is required to provide the necessary isolation function.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing these valves during refueling outages.

ALTERNATE TESTING:

Every 2 years these valves will be exercised and leakage tests performed to verify closure and leaktightness during Technical Specification 4.4.E.1 containment isolation valve testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

RELIEF REQUEST NO. VR-32

[WITHDRAWN]

RELIEF REQUEST NO. VR-33

SYSTEMS:

Various

VALVES:

Various

CATEGORIES

A and A/C

FUNCTION:

Valves provide containment isolation when in the closed position.

REQUIREMENT:

Category A valves shall be seat leaktested and a maximum permissible leakage rate shall be specified. Individual valve leakage rates shall be trended and analyzed as required by paragraphs IWV-3426 and IWV-3427.

BASIS FOR RELIEF:

Due to the configuration of the system piping and components, in many cases measurement of individual leakage rates is impractical. In these cases it is customary to perform tests with the test volume between valves in series or behind several valves in parallel paths.

IWV-3427(b) specifies additional maintenance and increased testing frequencies for valves sizes 6-inches and larger. The usefulness of these additional requirements does not justify the burden of compliance with these requirements. (Reference NRC Generic Letter 89-04)

ALTERNATE TESTING

When practical, Category A or A/C valves will be leak tested individually. In those cases where this is not the case, valves will be leaktested simultaneously in multiple valve arrangements and a maximum permissible leakage rate will be applied to each combination of valves.

The corrective action as specified in Subparagraph IWV-3427(b) will not be applied to valve test results.

RELIEF REQUEST NO. VR-34

[WITHDRAWN]

RELIEF REQUEST NO. VR-35

SYSTEM:

Boiler Feedwater (Dwg. No. ISI-20193)

VALVES:

BFD-35	BFD-40
BFD-37	BFD-42

CATEGORY

C

FUNCTION:

These check valves in the auxiliary boiler feedwater piping system open to provide flowpaths from the motor-driven auxiliary feedwater pumps to the steam generators. They close to prevent backflow through the system during periods when an AFW pump is idle.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

During power operation, full-stroke exercising these valves would require operating the auxiliary feedwater pumps injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles which is highly undesirable.

These valves have no position indication devices and verifying closure of these valves by backleakage requires the operation of turbine-driven AFW Pump #32 with flow directed to the steam generators. Again, during plant operation this is not practical due the potential of unacceptable thermal stress in the feedwater piping. During cold shutdown there is no steam available for the operation of AFW Pump #32. Thus the only practical time for verifying closure of these valves is during refueling outages.

ALTERNATE TESTING:

During cold shutdown periods, these valves will be full-stroke exercised open.

Every 2 years these valves will be verified closed during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump #32 full flow testing.

RELIEF REQUEST NO. VR-36

SYSTEM:

Various

VALVES:

This relief request applies to all safety/relief valves included in the Program.

CATEGORY

C

FUNCTION:

These valves provide over-pressure protection to the associated system components.

REQUIREMENT:

Safety and relief valves shall be tested in accordance with Subsection IWV-3510.

BASIS FOR RELIEF:

ANSI/ASME OM-1-1981 - Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices, was developed to supersede the requirements of Subsection IWV-3510. This standard is more definitive and better suited to operational testing than is ASME/PTC 25.3 which is referenced in the IWV-3510.

ALTERNATE TESTING:

Safety and relief valves will be tested in accordance with the requirements of ANSI/ASME OM-1-1981.

RELIEF REQUEST NO. VR-37

SYSTEM:

Main Steam (Dwg. No. ISI-20173)

VALVES:

MS-41 and MS-42

CATEGORY

C

FUNCTIONS:

These stop-check valves open to admit steam to the auxiliary feedwater pump turbine. They close to prevent uncontrolled blowdown of steam generators Nos. 32 and 33 in the event a steam leak occurs in piping associated with one of these steam generators. A handwheel is provided to allow manual closure of each valve.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

The only practical method of verifying proper full-stroke operation of these valves in the open direction is to operate the turbine-driven auxiliary feedwater pump at full rated flow with one of the valves manually closed.

During power operation, full-stroke exercising these valves as stated would require injection of cold water into the steam generators. This could result in thermal shock to the feedwater supply piping or the steam generator nozzles which is highly undesirable.

Partial-stroke exercising can be performed by operation of the pump in the recirculation mode.

During cold shutdown, steam is not available for operating Auxiliary Feedwater Pump #32, thus cold shutdown testing is impractical.

Since there are no position indicating devices on these stop check valves for determining disc position, there is no practical method of verifying full closure without operation of the valve handwheel.

ALTERNATE TESTING:

During normal plant operation, on a quarterly frequency, these valves will be partial-stroke exercised to the open position and exercised closed using the installed handwheel.

Every 2 years both the MS-41 and MS-42 valves will be full-stroked exercised open during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump #32 full flow testing.

During each reactor refueling outage, at least one of these valves will be disassembled, inspected, and manually exercised to verify operability. The schedule will be rotated such that valves are inspected during successive outages. During these inspections, should a disassembled valve prove to be inoperable (ie. incapable of performing its safety function), then, during the same outage, the other valve will be disassembled, inspected, and exercised to verify operability.

RELIEF REQUEST NO. VR-38

[WITHDRAWN]

RELIEF REQUEST NO. VR-39

[WITHDRAWN]

RELIEF REQUEST NO. VR-40

[WITHDRAWN]

RELIEF REQUEST NO. VR-41

[WITHDRAWN]

RELIEF REQUEST NO. VR-42

[WITHDRAWN]

RELIEF REQUEST NO. VR-43

SYSTEM:

Condensate (Dwg. No. ISI-20183 SH 1)

VALVES:

PCV-1187 thru PCV-1189

CATEGORY

B

FUNCTIONS:

These valves are opened to provide a supply of city water to the suction of the AFW pumps as a supplement to the contents of the condensate storage tank. They are normally closed to isolate the city water system from the condensate system.

REQUIREMENT:

Category A and B valves shall be exercised at least once every 3 months except as provided by IWV-3412(a), IWV-3415, and IWV-3416. (IWV-3411)

BASIS FOR RELIEF:

These valves are normally closed to isolate the city water system from the condensate system. They are only opened in the unlikely event that steam generator makeup is required via the auxiliary feedwater system and the contents of the condensate storage tank is exhausted.

Opening any of these valves exposes the condensate system to contaminates that would have an adverse effect the condensate and feedwater system chemistry. Following this, it would be required to perform an extensive flushing operation to ensure cleanliness. During plant operation or cold shutdown conditions such a test would result in an unreasonable burden on the plant staff.

ALTERNATE TESTING:

Every 2 years PCV-1187 thru PCV-1189 will be exercised during Technical Specification 4.8.1.c City Water Valve test.

RELIEF REQUEST NO. VR-44

[WITHDRAWN]

RELIEF REQUEST NO. VR-45

SYSTEM:

Component Cooling (CCW) Dwg. No. ISI-27203)

VALVES:

774A thru 774D

CATEGORY

C

FUNCTION:

In the event of a thermal barrier tube rupture these check valves close to protect the low pressure cooling water piping and associated containment penetration from over-pressure and gross failure.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Verifying closure of these valves requires performance of a backleakage test. Such a test requires containment entry and extensive valve manipulation and lineup changes. This represents a significant and unnecessary burden on the plant staff with no resulting commensurate increase in plant safety.

ALTERNATE TESTING:

During each reactor refueling outage these valves will be verified to close.

RELIEF REQUEST NO. VR-46

[WITHDRAWN]

RELIEF REQUEST NO. VR-47

SYSTEM:

Containment Spray (Dwg. No. ISI-27503)

VALVES:

1838A and 1838B

CATEGORY:

C

FUNCTION:

These valves open to provide sodium hydroxide flow to the associated containment spray additive eductor. They close to prevent the flow of water from an idle pump's loop that could effectively dilute the sodium hydroxide solution.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

These are simple check valves with no external position indication nor is there a practical method available to verify closure of these valves by observing back-leakage.

These valves are seldom operated, therefore, valve degradation as a result of wear or abuse is not likely.

ALTERNATE TESTING:

During each reactor refueling outage, nonintrusive techniques will be used to verify valve closure in accordance with NUREG-1482, Section 4.1.2. R

RELIEF REQUEST NO. VR-48

[WITHDRAWN]

RELIEF REQUEST NO. VR-49

SYSTEM:

Component Cooling (Dwg. No. ISI-27513)

VALVES:

751 A&B

CATEGORY:

C

FUNCTION:

These check valves open to provide flowpaths from the component cooling water (CCW) system headers to the respective RHR heat exchangers. They close for containment isolation.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

These are simple check valves with no external position indication or means of mechanical exercising. Thus, the only practical method of verifying closure is to perform a functional back-leakage test. Performing such a test requires a major realignment of the CCW system. During normal plant operation and cold shutdown conditions placing the plant in such an alignment could jeopardize the plant cooling capacity and capability.

ALTERNATE TESTING:

During each reactor refueling outage, non intrusive techniques will be used to verify valve closure in accordance with NUREG-1482, Section 4.1.2. R

RELIEF REQUEST NO. VR-50

SYSTEM:

Condensate and Boiler Feed (Dwg. No. ISI-20183)

VALVES:

CT-26, CT-29-2, CT-32

CATEGORY:

C

FUNCTION:

These check valves open to provide flowpath from the condensate storage tank to the auxiliary feedwater pumps.

REQUIREMENT:

Check valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Exercising these valves closed requires performing a qualitative leak test. City water is used to pressurize downstream of the check valves while back leakage is checked upstream of the check valves. The use of city water requires removing the pumps from service with extensive flushing and sampling during test restoration to ensure the condensate system is not chemically contaminated.

ALTERNATE TESTING:

These valves will be exercised closed every two years.

Appendix A

SUMMARY
INSERVICE TESTING PROGRAM
- PUMPS -

Appendix A: Summary-Inservice Testing Program - Pumps

LEGEND

Notation used in the pump summary table is as follows:

Pump — Pump identification number.

Description — Functional name of the pump.

ISI Class — Inservice inspection classification of the pump.

Dwg. No. — IP3 drawing number referring to the particular pump of interest. (See drawing list in Appendix B.)

Parameters

Refers to the test quantities to be measured or observed. When the character "Y" appears under a specific parameters then that measurement is made for that pump in accordance with the Code. A reference to a relief request accompanying the "Y" indicates some deviation from Code requirements. If the character "N" appears, that particular parameter will not be measured or observed and a relief request is provided if required. Requests for relief are identified as "PR-XX". All relief requests are included in Section 3.2.

Test Interval

The respective frequency of testing for each pump. The letter "Q" denotes a quarterly interval and "R" an interval such that tests are performed during each refueling outage.

IST Relief Request

Refers to any relief request not identified in parameter section.

IST Pump Tables

Pump	Description	IST Class	Drwg No.	IST Req Speed Meas.	IST Req Inlet Press Meas.	IST Req Diff Press Meas.	IST Req Flow Meas.	IST Req Vib Meas.	IST Req Brg Temp Meas.	IST Test Interval	IST Relief Request
ACC-31	AUX. COMPONENT COOLING PUMP #31	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	
ACC-32	AUX. COMPONENT COOLING PUMP #32	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	
ACC-33	AUX. COMPONENT COOLING PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	
ACC-34	AUX. COMPONENT COOLING PUMP #34	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	
ACC-CW-31	SIS PUMP CIRC WATER PUMP #31	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-18
ACC-CW-32	SIS PUMP CIRC WATER PUMP #32	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-18
ACC-CW-33	SIS PUMP CIRC WATER PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-18
ACC-SFP-31	SPENT FUEL PIT COOLING PUMP #31	3	ISI 27513-2	NA	Y	Y	Y	Y	N	Q	
ACC-SFP-32	SPENT FUEL PIT COOLING PUMP #32	3	ISI 27513-2	NA	Y	Y	Y	Y	N	Q	
AFW-31	MOTOR-DRIVEN AUX FEED PUMP #31	3	ISI 20193	NA	Y	Y	Y	Y	N	Q	
AFW-32	TURBINE-DRIVEN AUX FEED PUMP #32	3	ISI 20193	Y	Y	Y	N	Y	N	Q/R	PR-10
AFW-33	MOTOR-DRIVEN AUX FEED PUMP #33	3	ISI 20193	NA	Y	Y	Y	Y	N	Q	
BATP-31	BORIC ACID TRANSFER PUMP #31	NC	ISI 27363	NA	Y	Y	Y	Y	N	Q	
BATP-32	BORIC ACID TRANSFER PUMP #32	NC	ISI 27363	NA	Y	Y	Y	Y	N	Q	

Note : PR-2 thru PR-6 and PR-15 apply to all pumps.

IST Pump Tables

Pump	Description	IST Class	Drwg No.	IST Req Speed Meas.	IST Req Inlet Press Meas.	IST Req Diff Press Meas.	IST Req Flow Meas.	IST Req Vib Meas.	IST Req Brg Temp Meas.	IST Test Interval	IST Relief Request
CCW-31	COMPONENT COOLING PUMP #31	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CCW-32	COMPONENT COOLING PUMP #32	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CCW-33	COMPONENT COOLING PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CS-31	CONTAINMENT SPRAY PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
CS-32	CONTAINMENT SPRAY PUMP #32	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
CVCS-31	CHARGING PUMP #31	NC	ISI 27363	Y	Y	Y	Y	Y	N	Q	
CVCS-32	CHARGING PUMP #32	NC	ISI 27363	Y	Y	Y	Y	Y	N	Q	
CVCS-33	CHARGING PUMP #33	NC	ISI 27363	Y	Y	Y	Y	Y	N	Q	
REC-31	RECIRCULATION PUMP #31	2	ISI 27353	NA	Y (PR-7)	Y	N	Y	N	R	PR-9,11
REC-32	RECIRCULATION PUMP #32	2	ISI 27353	NA	Y (PR-7)	Y	N	Y	N	R	PR-9,11
RHR-31	RESIDUAL HEAT REMOVAL PUMP #31	2	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1*
RHR-32	RESIDUAL HEAT REMOVAL PUMP #32	2	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1*
SIS-31	SAFETY INJECTION PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
SIS-32	SAFETY INJECTION PUMP #32	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
SIS-33	SAFETY INJECTION PUMP #33	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
SWN-31	SERVICE WATER PUMP #31	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1
SWN-32	SERVICE WATER PUMP #32	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1
SWN-33	SERVICE WATER PUMP #33	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1
SWN-34	SERVICE WATER PUMP #34	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1
SWN-35	SERVICE WATER PUMP #35	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1
SWN-36	SERVICE WATER PUMP #36	3	ISI 20333-1	NA	Y (PR-7)	Y	Y	Y	N	Q	PR-1

*** RHR pump testing performed using a reference pump curve when plant is in a cold shutdown or cooldown configuration.**

Appendix B

SUMMARY
INSERVICE TESTING PROGRAM
- VALVES -

Reference Drawings

Appendix B: Summary-Inservice Testing Program - Valves

LEGEND

Notation used in the valve summary table is as follows:

Valve No.	The valve alpha-numerical identification.
System	The system in which the valve is installed.
Dwg. No./Coord.	Drawing number and drawing coordinate locator for the valve.
Description	Functional description of each valve.
Class/Cat	ISI classification/IST category
Size	The nominal valve size in inches.
Type	The valve type as follows: AOC Air-operated Control AOCK Air-Assisted Check Valve BU Butterfly CK Check DA Diaphram GA Gate GL Globe MSC Manual stop-check SF Safety/relief
Actuator	The valve actuator type as follows: AO Air-operated MA Manual MO Motor-operated SA Self-actuated SO Solenoid
Position	Refers to the normal position of the valve during plant operation at power - open or closed.

Appendix B: Summary-Inservice Testing Program - Valves

LEGEND (Cont.)

Reqm't Test requirement as follows:

A-X	Denotes augmented test requirement - not specifically required for Code compliance.
EC	Full-stroke exercise to the closed position.
EC-HW	Denotes exercise close of stop check valve or power-operated valve using an installed handwheel.
EO	Full-stroke exercise to open position.
FST-C	Fail-safe test to the closed position.
FST-O	Fail-safe test to the open position.
LT-1	Leakage test in accordance with 10 CFR 50. Appendix J.
LT-2	Leakage test - intersystem LOCA
PEO	Partial-stroke exercise to open position
PIT	Remote position indication verification
SP	Setpoint test of safety/relief valves
VI	Visual inspection of valve internals.
NI	Non-Intrusive Test

Freq The required test interval as follows:

OP	Quarterly during plant operation.
CS	Cold shutdown. See Paragraph 4.1.5.
RR	During reactor refueling outage (outages involving core alterations).
1.5Y	Every one and one half years
2Y	Every two years
5Y	Every 5 years
10Y	Refers to the test period for testing safety/ relief valves - 10 years

Relief Req Relief Requests are designated VR-XX. Refer to Section 3.2 for relief requests.

Notes Specific notes are provided at the end of Appendix B.

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
MS-1-31	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Isolation	2(B)	28	AOCK	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-1 CSJ-1	
MS-1-32	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Isolation	2(B)	28	AOCK	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-1 CSJ-1	
MS-1-33	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Isolation	2(B)	28	AOCK	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-1 CSJ-1	
MS-1-34	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Isolation	2(B)	28	AOCK	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-1 CSJ-1	
MS-2-31	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Non-Return Check	2(C)	28	CK	SA	O	A-EC	CS	CSJ-2	
MS-2-32	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Non-Return Check	2(C)	28	CK	SA	O	A-EC	CS	CSJ-2	
MS-2-33	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Non-Return Check	2(C)	28	CK	SA	O	A-EC	CS	CSJ-2	
MS-2-34	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Non-Return Check	2(C)	28	CK	SA	O	A-EC	CS	CSJ-2	
MS-41	MS	ISI-20173 (F8)	#32 Aux. Boiler Feedpump Steam Supply From #32 Main Steam Line	2(C)	4	MSC	SA	C	PEO EO EC-HW EC-VI	OP 2Y OP RR	 VR-37 VR-37 VR-37	 ROJ-1 ROJ-1
MS-42	MS	ISI-20173 (F7)	#32 Aux. Boiler Feedpump Steam Supply From #33 Main Steam Line	2(C)	4	MSC	SA	C	PEO EO EC-HW EC-VI	OP 2Y OP RR	 VR-37 VR-37 VR-37	 ROJ-1 ROJ-1
MS-45-1	MS	ISI-20173 (F8)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-45-2	MS	ISI-20173 (H8)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-45-3	MS	ISI-20173 (E8)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-45-4	MS	ISI-20173 (D8)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
MS-46-1	MS	ISI-20173 (F8)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-46-2	MS	ISI-20173 (H8)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-46-3	MS	ISI-20173 (E8)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-46-4	MS	ISI-20173 (D8)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-47-1	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-47-2	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-47-3	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-47-4	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-48-1	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-48-2	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-48-3	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-48-4	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-49-1	MS	ISI-20173 (F7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-49-2	MS	ISI-20173 (H7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-49-3	MS	ISI-20173 (E7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-49-4	MS	ISI-20173 (D7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y	VR-36	
MS-52	MS	ISI-20173 (H6)	#32 ABFP Steam Pressure Reducing Staion Relief	3(C)	4	SF	SA	C	SP	10Y	VR-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1134	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Atmospheric Relief Valve	2(B)	6	GL	AO	C	EO EC FST-C PIT	CS CS CS 2Y	CSJ-3 CSJ-3 CSJ-3	
PCV-1135	MS	ISI-20173 (G7)	#32 Steam Generator Main Steam Atmospheric Relief Valve	2(B)	6	GL	AO	C	EO EC FST-C PIT	CS CS CS 2Y	CSJ-3 CSJ-3 CSJ-3	
PCV-1136	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Atmospheric Relief Valve	2(B)	6	GL	AO	C	EO EC FST-C PIT	CS CS CS 2Y	CSJ-3 CSJ-3 CSJ-3	
PCV-1137	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Atmospheric Relief Valve	2(B)	6	GL	AO	C	EO EC FST-C PIT	CS CS CS 2Y	CSJ-3 CSJ-3 CSJ-3	
PCV-1139	MS	ISI-20173 (H6)	#32 Aux. Feed Pump Steam Control	3(B)	3	AOC	AO	C	EO EC FST-O PIT	OP OP OP 2Y		
PCV-1310A	MS	ISI-20173 (G6)	Main Steam Supply to #32 Aux. Feed Pump Room Isolation	2(B)	4	GA	AO	O	EC PIT	OP 2Y		
PCV-1310B	MS	ISI-20173 (G6)	Main Steam Supply to #32 Aux. Feed Pump Room Isolation	3(B)	4	GA	AO	O	EC PIT	OP 2Y		

R

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1158-1	COND	ISI-20183 (D7)	Condensate Storage Tank Low-Level Isolation Valve	3(B)	12	BU	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-4 CSJ-4	
1158-2	COND	ISI-20183 (D-7)	Condensate Storage Tank Low-Level Isolation Valve	NC(B)	12	BU	AO	O	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-5 CSJ-5	
CT-107	COND	ISI-20183 (F6)	CST Return Line Isolation Check	3(C)	6	CK	SA	O	EC	CS	CSJ-6	
CT-26	COND	ISI-20183 (E7)	#31 Aux. Feed Pump Suction From CST	3(C)	6	CK	SA	C	PEO EO EC	OP CS 2Y	 CSJ-7 VR-50	 ROJ-2
CT-28	COND	ISI-20183 (F7)	#32 Aux. Feed Pump City Water Supply Check	NC(C)	6	CK	SA	C	A-PEO	2Y		Note 2
CT-29-1	COND	ISI-20183 (F7)	#31 Aux. Feed Pump City Water Supply Check	NC(C)	6	CK	SA	C	A-PEO	2Y		Note 2
CT-29-2	COND	ISI-20183 (F7)	#32 Aux. Feed Pump Suction From CST	3(C)	8	CK	SA	C	PEO EO EC	OP 2Y 2Y	 VR-3 VR-50	 ROJ-3 ROJ-2
CT-31	COND	ISI-20183 (E7)	#33 Aux. Feed Pump City Water Supply Check	NC(C)	6	CK	SA	C	A-PEO	2Y		Note 2
CT-32	COND	ISI-20183 (E7)	#33 Aux. Feed Pump Suction From CST	3(C)	6	CK	SA	C	PEO EO EC	OP CS 2Y	 CSJ-7 VR-50	 ROJ-2
CT-35-1	COND	ISI-20183 (E8)	#33 AFW Pump Suction Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
CT-35-2	COND	ISI-20183 (E8)	#31 AFW Pump Suction Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
CT-6	COND	ISI-20183 (G7)	CST Supply to Aux. Feed Pumps Isolation	3(B)	12	BU	MA	O	PIT	2Y		Passive
CT-64	COND	ISI-20183 (E7)	CST Supply to Aux. Feed Pumps Isolation	3(B)	8	GA	MA	O	PIT	2Y		Passive
CT-85-1	COND	ISI-20183 (E8)	#31 Auxiliary Feed Pump Rotor Thrust Balancing Check	3(B)	1 1/2	CK	SA	C	EO	OP		
CT-85-2	COND	ISI-20183 (F8)	#32 Auxiliary Feed Pump Rotor Thrust Balancing Check	3(B)	1 1/2	CK	SA	C	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1187	COND	ISI-20183 (F7)	#31 AFWP City Water Makeup Isolation	3(B)	6	GA	AO	C	EO	2Y	VR-43	ROJ-4
									FST-C	2Y	VR-43	ROJ-4
									PIT	2Y		
PCV-1188	COND	ISI-20183 (F7)	#32 AFWP City Water Makeup Isolation	3(B)	8	GA	AO	C	EO	2Y	VR-43	ROJ-4
									FST-C	2Y	VR-43	ROJ-4
									PIT	2Y		
PCV-1189	COND	ISI-20183 (E7)	#33 AFWP City Water Makeup Isolation	3(B)	6	GA	AO	C	EO	2Y	VR-43	ROJ-4
									FST-C	2Y	VR-43	ROJ-4
									PIT	2Y		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
BFD-2-31	FW	ISI-20193 (G3)	#31 Boiler Feed Pump Discharge MOV	NC	20	GA	MO	O	A-EC	RR		Note 2
BFD-2-32	FW	ISI-20193 (F3)	#32 Boiler Feed Pump Discharge MOV	NC	20	GA	MO	O	A-EC	RR		Note 2
BFD-31	FW	ISI-20193 (B5)	#32 Aux. Feed Pump Discharge Check	3(C)	6	CK	SA	C	EO PEO	2Y CS	VR-5 CSJ-9	ROJ-5
BFD-34	FW	ISI-20193 (B5)	#31 Aux. Feed Pump Discharge Check	3(C)	4	CK	SA	C	EO	CS	CSJ-8	
BFD-35	FW	ISI-20193 (B7)	#31 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC	CS 2Y	CSJ-10 VR-35	 ROJ-6
BFD-37	FW	ISI-20193 (B7)	#31 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC	CS 2Y	CSJ-10 VR-35	 ROJ-6
BFD-39	FW	ISI-20193 (B6)	#33 Aux. Feed Pump Discharge Check	3(C)	4	CK	SA	C	EO	CS	CSJ-8	
BFD-40	FW	ISI-20193 (B6)	#33 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC	CS 2Y	CSJ-10 VR-35	 ROJ-6
BFD-42	FW	ISI-20193 (B6)	#33 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC	CS 2Y	CSJ-10 VR-35	 ROJ-6
BFD-47-1	FW	ISI-20193 (B4)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC PEO	2Y CS CS	VR-5 CSJ-11 CSJ-9	ROJ-5
BFD-47-2	FW	ISI-20193 (B3)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC PEO	2Y CS CS	VR-5 CSJ-11 CSJ-9	ROJ-5
BFD-47-3	FW	ISI-20193 (B3)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC PEO	2Y CS CS	VR-5 CSJ-11 CSJ-9	ROJ-5
BFD-47-4	FW	ISI-20193 (B2)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	CK	SA	C	EO EC PEO	2Y CS CS	VR-5 CSJ-11 CSJ-9	ROJ-5
BFD-50	FW	ISI-20193 (B4)	#32 Aux. Feed Pump Min. Flow Check	3(C)	3	CK	SA	C	EO	OP		
BFD-52	FW	ISI-20193 (A7)	#31 Aux. Feed Pump Min. Flow Check	3(C)	2	CK	SA	C	EO	OP		
BFD-54	FW	ISI-20193 (A8)	#33 Aux. Feed Pump Min. Flow Check	3(C)	2	CK	SA	C	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
BFD-6-1	FW	ISI-20193 (D7)	#31 Steam Generator Feedwater Supply Check	2(C)	18	CK	SA	O	EC	CS	CSJ-12	
BFD-6-2	FW	ISI-20193 (E7)	#32 Steam Generator Feedwater Supply Check	2(C)	18	CK	SA	O	EC	CS	CSJ-12	
BFD-6-3	FW	ISI-20193 (G7)	#33 Steam Generator Feedwater Supply Check	2(C)	18	CK	SA	O	EC	CS	CSJ-12	
BFD-6-4	FW	ISI-20193 (F7)	#34 Steam Generator Feedwater Supply Check	2(C)	18	CK	SA	O	EC	CS	CSJ-12	
BFD-67	FW	ISI-20193 (E8)	Aux. Feed Pump Discharge To #32 Steam Generator Check	2(C)	4	CK	SA	C	EO	CS	CSJ-13	
BFD-68	FW	ISI-20193 (D8)	Aux. Feed Pump Discharge To #31 Steam Generator Check	2(C)	4	CK	SA	C	EO	CS	CSJ-13	
BFD-69	FW	ISI-20193 (G8)	Aux. Feed Pump Discharge To #33 Steam Generator Check	2(C)	4	CK	SA	C	EO	CS	CSJ-13	
BFD-70	FW	ISI-20193 (F8)	Aux. Feed Pump Discharge To #34 Steam Generator Check	2(C)	4	CK	SA	C	EO	CS	CSJ-13	
CD-122	FW	ISI-20193 (B4)	#32 Aux. Feedwater Pump Bearing Cooling Discharge Check	3(C)	2	CK	SA	C	EO	OP		
CD-123	FW	ISI-20193 (B4)	#32 Aux. Feedwater Pump Bearing Cooling Relief	3(C)	3	SF	SA	C	SP	10Y	VR-36	
FCV-1121	FW	ISI-20193 (A7)	#31 Aux. Feed Pump Recirculation Control to the CST	3(B)	2	GA	AO	C	EO EC FST-C PIT	OP OP OP 2Y		
FCV-1123	FW	ISI-20193 (A8)	#33 Aux. Feed Pump Recirculation Control to the CST	3(B)	2	GA	AO	C	EO EC FST-C PIT	OP OP OP 2Y		
FCV-405A	FW	ISI-20193 (B3)	#32 Aux. Feed Pump To #31 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-405B	FW	ISI-20193 (B3)	#32 Aux. Feed Pump To #32 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-405C	FW	ISI-20193 (B4)	#32 Aux. Feed Pump To #33 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-405D	FW	ISI-20193 (B3)	#32 Aux. Feed Pump To #34 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-406A	FW	ISI-20193 (B8)	#31 Aux. Feed Pump To #31 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-406B	FW	ISI-20193 (B7)	#31 Aux. Feed Pump To #32 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-406C	FW	ISI-20193 (B6)	#33 Aux. Feed Pump To #33 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-406D	FW	ISI-20193 (B7)	#33 Aux. Feed Pump To #34 S/G Feed Control	3(B)	2	GL	AO	C	EO EC FST-O	OP OP OP		
FCV-417	FW	ISI-20193 (D6)	#31 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	O	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-14 CSJ-14	
FCV-417L	FW	ISI-20193 (D-7)	#31 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	C	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-59 CSJ-59	
FCV-427	FW	ISI-20193 (E6)	#32 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	O	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-14 CSJ-14	
FCV-427L	FW	ISI-20193 (E6)	#32 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	C	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-59 CSJ-59	
FCV-437	FW	ISI-20193 (G6)	#33 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	O	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-14 CSJ-14	
FCV-437L	FW	ISI-20193 (G7)	#33 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	C	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-59 CSJ-59	
FCV-447	FW	ISI-20193 (F6)	#34 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	O	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-14 CSJ-14	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-447L	FW	ISI-20193 (F7)	#34 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	C	A-EC A-FST-C A-PIT	CS CS 2Y	CSJ-59 CSJ-59	
PCV-1213	FW	ISI-20193 (B4)	#32 ABFP Bearing Cooling Water Pressure Control Valve	3(B)	1	GL	AO	C	EO FST-O	OP OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1229	CAR	ISI-20253 (E8)	Isolation Valve From SJAE's	NC(A)	4	GA	AO	C	EO EC FST-C PIT LT-1	OP OP OP 2Y 5Y	 VR-33	
PCV-1230	CAR	ISI-20253 (E8)	Isolation Valve From SJAE's	NC(A)	4	GA	AO	C	EO EC FST-C PIT LT-1	OP OP OP 2Y 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-1111	RW	ISI-20333 (F3)	SWP'S 34,35,36 to Conventional Non Essential Header Disc.	3(B)	16	BU	MA	O	EC	OP		
FCV-1112	RW	ISI-20333 (F3)	SWP'S 31,32,33 to Conventional Non Essential Header Disc.	3(B)	16	BU	MA	O	EC	OP		
PCV-1205	RW	ISI-20333 (C3)	#31 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
PCV-1206	RW	ISI-20333 (C4)	#32 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
PCV-1207	RW	ISI-20333 (C5)	#33 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
PCV-1208	RW	ISI-20333 (C6)	#34 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
PCV-1209	RW	ISI-20333 (C7)	#35 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
PCV-1210	RW	ISI-20333 (C8)	#36 Service Water Pump Strainer Backwash	3(B)	2	GA	AO	C	EO EC FST-C	OP OP OP		
SWN-1-1	RW	ISI-20333 (C3)	#31 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	
SWN-1-2	RW	ISI-20333 (C4)	#32 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	
SWN-1-3	RW	ISI-20333 (C5)	#33 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	
SWN-1-4	RW	ISI-20333 (C6)	#34 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	
SWN-1-5	RW	ISI-20333 (C7)	#35 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SWN-1-6	RW	ISI-20333 (C8)	#36 Service Water Pump Discharge Check	3(C)	14	CK	SA	O	EO EC PEO	CS OP OP	CSJ-15	
SWN-100-1	RW	ISI-20333 (G5)	#34, 35, & 36 Service Water Pump Header to Nuclear Services	3(C)	24	CK	SA	O	EO	CS	CSJ-16	
SWN-100-2	RW	ISI-20333 (G5)	#31, 32, & 33 Service Water Pump Header to Nuclear Services	3(C)	24	CK	SA	O	EO	CS	CSJ-16	
SWN-100-3	RW	ISI-20333 (G6)	Backup Service Water Discharge to Nuclear Services Header	3(C)	24	CK	SA	C	EC	OP		
SWN-100-4	RW	ISI-20333 (G6)	Backup Service Water Discharge to Nuclear Services Header	3(C)	24	CK	SA	C	EC	OP		
SWN-4	RW	ISI-20333 (D5)	Service Water to Circ Pump Cooling Isolation	3(B)	8	BU	MA	O/C	EC	OP		
SWN-5	RW	ISI-20333 (D6)	Service Water to Circ Pump Cooling Isolation	3(B)	8	BU	MA	O/C	EC	OP		
SWN-6	RW	ISI-20333 (G4)	SWP'S 34,35,36 to Conventional Essential Header Discharge	3(B)	10	BU	MA	O/C	EC	OP		
SWN-7	RW	ISI-20333 (F4)	SWP'S 31,32,33 to Conventional Essential Header Discharge	3(B)	10	BU	MA	O/C	EC	OP		
SWN-9-1	RW	ISI-20333 (C2)	#31 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
SWN-9-2	RW	ISI-20333 (C2)	#32 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
SWN-9-3	RW	ISI-20333 (C2)	#33 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
SWN-9-4	RW	ISI-20333 (C2)	#34 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
SWN-9-5	RW	ISI-20333 (C2)	#35 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
SWN-9-6	RW	ISI-20333 (C2)	#36 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SA-24-1	AIR	ISI-20353 (F7)	Containment Isolation	NC(A)	2	DA	MA	C	LT-1	5Y	VR-33	Passive
SA-24-2	AIR	ISI-20353 (F6)	Containment Isolation	NC(A)	2	DA	MA	C	LT-1	5Y	VR-33	Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
IA-39	AIR	ISI-20363 (F6)	Inboard Containment Isolation	NC(A/C)	2	CK	SA	O	EC LT-1	2Y 5Y	VR-6	ROJ-7
PCV-1228	AIR	ISI-20363 (F6)	Outboard Containment Isolation	NC(A)	2	DA	AO	O	EC FST-C PIT LT-1	2Y 2Y 2Y 5Y	VR-6 VR-6	ROJ-7 ROJ-7

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
MS-34-10	MS	ISI-20413 (E4)	#33 Steam Generator MST-14 Inlet Isolation	2(B)	1	GA	MA	O	EC	OP		
MS-34-4	MS	ISI-20413 (G5)	#32 Steam Generator MST-10 Inlet Isolation	2(B)	1	GA	MA	O	EC	OP		
MS-34-5	MS	ISI-20413 (G4)	#32 Steam Generator MST-12 Inlet Isolation	2(B)	1	GA	MA	O	EC	OP		
MS-34-7	MS	ISI-20413 (G3)	#31 Steam Generator MST-6 Inlet Isolation	2(B)	1	GA	MA	O	EC	OP		
MS-34-9	MS	ISI-20413 (E6)	#34 Steam Generator MST-18 Inlet Isolation	2(B)	1	GA	MA	O	EC	OP		
MS-37-1	MS	ISI-20413 (G2)	#31 Steam Generator MST-5 Inlet Isolation	2(B)	1 1/4	GA	MA	O	EC	OP		
MS-37-2	MS	ISI-20413 (E5)	#33 Steam Generator MST-13 Inlet Isolation	2(B)	1 1/4	GA	MA	O	EC	OP		
MS-67-1	MS	ISI-20413 (E2)	#31 Steam Generator MST-1 Inlet Isolation	2(B)	1 1/2	GA	MA	O	EC	OP		
MS-67-2	MS	ISI-20413 (G2)	#32 Steam Generator MST-2 Inlet Isolation	2(B)	1 1/2	GA	MA	O	EC	OP		
MS-67-3	MS	ISI-20413 (E3)	#33 Steam Generator MST-3 Inlet Isolation	2(B)	1 1/2	GA	MA	O	EC	OP		
MS-67-4	MS	ISI-20413 (E5)	#34 Steam Generator MST-4 Inlet Isolation	2(B)	1 1/2	GA	MA	O	EC	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PS-10	SMPL	ISI-26533 (G7)	Containment Vent Sample Isolation	NC(A)	2	DA	MA	C	LT-1	5Y	VR-33	Passive
PS-7	SMPL	ISI-26533 (G7)	Containment Vent Sample Isolation	NC(A)	3	DA	MA	C	LT-1	5Y	VR-33	Passive
PS-8	SMPL	ISI-26533 (G7)	Containment Vent Sample Isolation	NC(A)	3	DA	MA	C	LT-1	5Y	VR-33	Passive
PS-9	SMPL	ISI-26533 (F7)	Containment Vent Sample Isolation	NC(A)	3	DA	MA	C	LT-1	5Y	VR-33	Passive
SOV-506	SMPL	ISI-26533 (E6)	#33 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-507	SMPL	ISI-26533 (E5)	#34 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-508	SMPL	ISI-26533 (D5)	#31 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-509	SMPL	ISI-26533 (E4)	#31,#33,#34 Fan Cooler Units Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-510	SMPL	ISI-26533 (C4)	H2 Analyzer A Return to Containment Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-511	SMPL	ISI-26533 (B5)	H2 Analyzer A Return to Containment Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-512	SMPL	ISI-26533 (D5)	#32 Fan Cooler Unit Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SOV-513	SMPL	ISI-26533 (C5)	#35 Fan Cooler Unit Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-514	SMPL	ISI-26533 (D4)	#32,#35 Fan Cooler Units Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-515	SMPL	ISI-26533 (B4)	H2 Analyzer B Sample Return to Containment Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	
SOV-516	SMPL	ISI-26533 (B5)	H2 Analyzer B Sample Return to Containment Isolation	NC(A)	1	GL	SO	C	EC FST-C LT-1 PIT	OP OP 5Y 2Y	VR-1 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1610	WD	ISI-27193 SH1 (F3)	N2 Supply to RCDT #31 Isolation	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-1	
1616	WD	ISI-27193 SH1 (F3)	N2 Supply to RCDT #31 Isolation Check	NC(A/C)	1	CK	SA	O	EC LT-1	2Y 5Y	VR-7	ROJ-8
1702	WD	ISI-27193 SH1 (D3)	RCDT #31 Inboard Drain	NC(A)	3	GA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1705	WD	ISI-27193 SH1 (D3)	RCDT #31 Outboard Drain	NC(A)	3	GA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1723	WD	ISI-27193 SH2 (C4)	Containment Sump Discharge Outboard Isolation Valve	NC(A)	2	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1728	WD	ISI-27193 SH2 (C4)	Containment Sump Discharge Inboard Isolation Valve	NC(A)	2	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1786	WD	ISI-27193 SH1 (F3)	RCDT #31 Discharge to Waste Gas	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1787	WD	ISI-27193 SH1 (F3)	RCDT #31 Discharge to Waste Gas	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	
1788	WD	ISI-27193 SH1 (E3)	RCDT #31 Gas Sample Inboard	NC(A)	3/4	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1789	WD	ISI-27193 SH1 (E3)	Reactor Coolant Drain Tank to Gas Analyzer Isolation Valve	NC(A)	3/4	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1836	RHR	ISI-27203 (B3)	RHR Supply Safety Relief	2(C)	2	SF	SA	C	SP	10Y	VR-36	
730	RHR	ISI-27203 (C3)	RHR Supply from RCS	1(A)	14	GA	MO	C	EO A-EC LT-2 PIT	CS CS 2Y 2Y	CSJ-17 CSJ-17	
731	RHR	ISI-27203 (C3)	RHR Supply from RCS	1(A)	14	GA	MO	C	EO A-EC LT-2 PIT	CS CS 2Y 2Y	CSJ-17 CSJ-17	
741	RHR	ISI-27203 (B6)	RHR Pump Discharge to Heat Exchanger	2(A/C)	12	CK	SA	C	PEO EO EC LT-1	OP CS 2Y 5Y	 CSJ-18 VR-8	 ROJ-9
745A	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
745B	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
774A	CC	ISI-27203 (F7)	#31 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	VR-45	ROJ-10
774B	CC	ISI-27203 (F6)	#32 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	VR-45	ROJ-10
774C	CC	ISI-27203 (F4)	#33 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	VR-45	ROJ-10
774D	CC	ISI-27203 (F3)	#34 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	VR-45	ROJ-10
782	CC	ISI-27203 (B8)	RCP/Sup. Block Ret. Relief Valve	3(C)	3	SF	SA	C	SP	10Y	VR-36	
783A	CC	ISI-27203 (F6)	#31 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
783B	CC	ISI-27203 (F6)	#32 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
783C	CC	ISI-27203 (F6)	#33 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
783D	CC	ISI-27203 (F6)	#34 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
792	CC	ISI-27203 (C4)	Excess Letdown HX Shell Relief	3(C)	3	SF	SA	C	SP	10Y	VR-36	
819A	CC	ISI-27203 (D6)	RHR HX #31 Shell-side Relief Valve	3(C)	1 1/2	SF	SA	C	SP	10Y	VR-36	
819B	CC	ISI-27203 (D7)	RHR HX #32 Shell-side Relief Valve	3(C)	1 1/2	SF	SA	C	SP	10Y	VR-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-1176	RW	ISI-27223 (B2)	Emergency Diesel Generators SWS Outlet Flow Control	3(B)	6	BU	AO	C	EO FST-O PIT	OP OP 2Y		
FCV-1176A	RW	ISI-27223 (B2)	Emergency Diesel Generators SWS Outlet Flow Control	3(B)	6	BU	AO	C	EO FST-O PIT	OP OP 2Y		
SWN-108-3	RW	ISI-27223 (C3)	Service Water Supply to CCR A/C Cross Connect	3(B)	3	GA	MA	O	EC	OP		
SWN-108-6	RW	ISI-27223 (C3)	Service Water Supply to CCR A/C Cross Connect	3(B)	3	GA	MA	O	EC	OP		
SWN-110-1	RW	ISI-27223 (C3)	#31, 32, & 33 Service Water Pump Supply to CCR A/C Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
SWN-110-2	RW	ISI-27223 (C3)	#34, 35, & 36 Service Water Pump Supply to CCR A/C Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
SWN-137	RW	ISI-27223 (C6)	#34, 35 & 36 Service Water Pump Supply to SGBD HX Cooling Water	3(B)	4	GA	MA	O/C	EC	OP		
SWN-138	RW	ISI-27223 (C5)	#31, 32 & 33 Service Water Pump Supply to SGBD HX Cooling Water	3(B)	4	GA	MA	O/C	EC	OP		
SWN-29	RW	ISI-27223 (B4)	#31, 32, & 33 Service Water Pump Supply to Emergency Diesel Coolers Isolation	3(B)	10	BU	MA	O/C	EO	OP		
SWN-30	RW	ISI-27223 (B4)	#34, 35, & 36 Service Water Pump Supply to Emergency Diesel Coolers Isolation	3(B)	10	BU	MA	O/C	EO	OP		
SWN-31	RW	ISI-27223 (D4)	#31, 32, & 33 Service Water Pump Supply to CCW HX Header Isolation	3(B)	20	BU	MA	O/C	EO	OP		
SWN-32	RW	ISI-27223 (D3)	#34, 35, & 36 Service Water Pump Supply to CCW HX Header Isolation	3(B)	20	BU	MA	O/C	EO	OP		
SWN-33-1	RW	ISI-27223 (D3)	CCW HX's Service Water Supply Crosstie Isolation	3(B)	18	BU	MA	O	EC	OP		
SWN-33-2	RW	ISI-27223 (D3)	CCW HX's Service Water Supply Crosstie Isolation	3(B)	18	BU	MA	O	EC	OP		
SWN-41-1	RW	ISI-27223 (E5)	#31 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-41-2	RW	ISI-27223 (E5)	#32 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SWN-41-3	RW	ISI-27223 (E6)	#33 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-41-4	RW	ISI-27223 (E6)	#34 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-41-5	RW	ISI-27223 (E4)	#35 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-42-1	RW	ISI-27223 (E5)	#31 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-1	10Y 5Y	VR-36 VR-33	
SWN-42-2	RW	ISI-27223 (E5)	#32 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-1	10Y 5Y	VR-36 VR-33	
SWN-42-3	RW	ISI-27223 (E6)	#33 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-1	10Y 5Y	VR-36 VR-33	
SWN-42-4	RW	ISI-27223 (E6)	#34 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-1	10Y 5Y	VR-36 VR-33	
SWN-42-5	RW	ISI-27223 (E4)	#35 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-1	10Y 5Y	VR-36 VR-33	
SWN-43-1	RW	ISI-27223 (E5)	#31 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	5Y	VR-33	Passive
SWN-43-2	RW	ISI-27223 (E4)	#32 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	5Y	VR-33	Passive
SWN-43-3	RW	ISI-27223 (E6)	#33 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	5Y	VR-33	Passive
SWN-43-4	RW	ISI-27223 (E6)	#34 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	5Y	VR-33	Passive
SWN-43-5	RW	ISI-27223 (E4)	#35 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	5Y	VR-33	Passive
SWN-44-1	RW	ISI-27223 (F5)	#31 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-44-2	RW	ISI-27223 (F4)	#32 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-44-3	RW	ISI-27223 (F6)	#33 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-44-4	RW	ISI-27223 (F6)	#34 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	
SWN-44-5	RW	ISI-27223 (F4)	#35 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-1	OP 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SWN-51-1	RW	ISI-27223 (F4)	#31 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-51-2	RW	ISI-27223 (F4)	#32 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-51-3	RW	ISI-27223 (F4)	#33 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-51-4	RW	ISI-27223 (F4)	#34 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-51-5	RW	ISI-27223 (F4)	#35 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-62-1	RW	ISI-27223 (C3)	#31, 32, & 33 Service Water Pump Supply to Emergency Diesel #31 Cooler Isolation	3(B)	4	BU	MA	O	EO EC	OP OP		
SWN-62-2	RW	ISI-27223 (C3)	#34, 35, & 36 Service Water Pump Supply to Emergency Diesel #31 Cooler Isolation	3(B)	4	BU	MA	O	EO EC	OP OP		
SWN-71-1	RW	ISI-27223 (F5)	#31 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-71-2	RW	ISI-27223 (F5)	#32 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-71-3	RW	ISI-27223 (F5)	#33 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-71-4	RW	ISI-27223 (F5)	#34 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-71-5	RW	ISI-27223 (F5)	#35 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-1	OP 5Y	VR-33	
SWN-94-1	RW	ISI-27223 (C4)	#31, 32, & 33 Service Water Pump to CCR A/C Isolation	3(B)	3	GA	MA	O	EO EC	OP OP		
SWN-94-2	RW	ISI-27223 (C4)	#34, 35, & 36 Service Water Pump to CCR A/C Isolation	3(B)	3	GA	MA	O	EO EC	OP OP		
TCV-1104	RW	ISI-27223 (G3)	Containment Temperature Control Valve	3(B)	18	BU	AO	C	EO FST-O PIT	OP OP 2Y		
TCV-1105	RW	ISI-27223 (G3)	Containment Temperature Control Valve	3(B)	10	BU	AO	C	EO FST-O PIT	OP OP 2Y		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
16	N2	ISI-27233 (E7)	PCV-455C Accumulator Check	NC(C)	3/4	CK	SA	C	A-EC	RR		Note 2
17	N2	ISI-27233 (E7)	PCV-456 Accumulator Check	NC(C)	3/4	CK	SA	C	A-EC	RR		Note 2
863	N2	ISI-27233 (D6)	Containment N2 Supply Outboard	NC(A)	1	GA	AO	C	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-1	
NNE-1607	N2	ISI-27233 (G7)	Containment N2 Supply for Test Equipment Isolation Valve	NC(A)	3/4	GL	MA	C	LT-1	5Y		Passive
NNE-1610	N2	ISI-27233 (G7)	Containment N2 Supply Isolation Valve Inside Containment	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	VR-10	ROJ-11
NNE-1864	N2	ISI-27233 (H5)	Codensate Storage Tank Breather Valve	NC(C)	12	SF	SA	C	SP	10Y	VR-36	
NNE-1865	N2	ISI-27233 (H5)	Codensate Storage Tank Breather Valve	NC(C)	12	SF	SA	C	SP	10Y	VR-36	

A

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
DW-AOV-1	DW	ISI-27243 (F5)	Demin Water To Containment Isolation	NC(A)	2	GA	AO	C	LT-1 PIT	5Y 2Y	VR-33	Passive
DW-AOV-2	DW	ISI-27243 (F5)	Demin Water To Containment Isolation	NC(A)	2	GA	AO	C	LT-1 PIT	5Y 2Y	VR-33	Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1214	SG	ISI-27293 SH1 (E6)	#31 SG Blowdown Upstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1214A	SG	ISI-27293 SH1 (E5)	#31 SG Blowdown Downstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1215	SG	ISI-27293 SH1 (E6)	#32 SG Blowdown Upstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1215A	SG	ISI-27293 SH1 (E5)	#32 SG Blowdown Downstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1216	SG	ISI-27293 SH1 (F6)	#33 SG Blowdown Upstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1216A	SG	ISI-27293 SH1 (F5)	#33 SG Blowdown Downstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1217	SG	ISI-27293 SH1 (G6)	#34 SG Blowdown Upstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1217A	SG	ISI-27293 SH1 (G5)	#34 SG Blowdown Downstream Containment Isolation	2(A)	3	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1223	SG	ISI-27293 SH2 (G7)	#31 SG Blowdown Sample Upstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1223A	SG	ISI-27293 SH2 (G7)	#31 SG Blowdown Sample Downstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1224	SG	ISI-27293 SH2 (E7)	#32 SG Blowdown Sample Upstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1224A	SG	ISI-27293 SH2 (E7)	#32 SG Blowdown Sample Downstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1225	SG	ISI-27293 SH2 (F7)	#33 SG Blowdown Sample Upstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1225A	SG	ISI-27293 SH2 (F7)	#33 SG Blowdown Sample Downstream Containment Isolation	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1226	SG	ISI-27293 SH2 (D7)	#34 SG Blowdown Sample Upstream Containment Isolation Valve	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1226A	SG	ISI-27293 SH2 (D7)	#34 SG Blowdown Sample Downstream Containment Isolation Valve	2(A)	1/2	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1802A	SI	ISI-27353 (B5)	Recirculating Pump Discharge Isolation Valve	2(B)	10	GA	MO	C	EO EC PIT	RR RR RR	VR-18 VR-18 VR-18	ROJ-12 ROJ-12 ROJ-12
1802B	SI	ISI-27353 (B4)	Recirculating Pump Discharge Isolation Valve	2(B)	10	GA	MO	C	EO EC PIT	RR RR RR	VR-18 VR-18 VR-18	ROJ-12 ROJ-12 ROJ-12
1820	SI	ISI-27353 (B5)	Recirculating Pump Min Flow Line Check Valve	2(C)	2	CK	SA	C	EO	2Y	VR-19	ROJ-13
1869A	SI	ISI-27353 (C4)	RHR HX #32 to SIS Pump Isolation Valve	2(B)	6	GA	MO	O	EC PIT	OP 2Y		
1869B	SI	ISI-27353 (C4)	RHR HX #31 to SIS Pump Isolation Valve	2(B)	6	GA	MO	O	EC PIT	OP 2Y		
733A	SI	ISI-27353 (C5)	RHR HX #32 Outlet Safety Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
733B	SI	ISI-27353 (C5)	RHR HX #31 Outlet Safety Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
746	SI	ISI-27353 (C5)	#31 RHR HX Outlet Injection Stop Valve	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
747	SI	ISI-27353 (C5)	#32 RHR HX Outlet Injection Stop Valve	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
838A	SI	ISI-27353 (C7)	RHR Return Low Head Injection Loop #1	1(A/C)	6	CK	SA	C	EO EC LT-2	CS CS 2Y	CSJ-19 CSJ-20	
838B	SI	ISI-27353 (B6)	RHR Return Low Head Injection Loop #2	1(A/C)	6	CK	SA	C	EO EC LT-2	CS CS 2Y	CSJ-19 CSJ-20	
838C	SI	ISI-27353 (B6)	RHR Return Low Head Injection Loop #3	1(A/C)	6	CK	SA	C	EO EC LT-2	CS CS 2Y	CSJ-19 CSJ-20	
838D	SI	ISI-27353 (B6)	RHR Return Low Head Injection Loop #4	1(A/C)	6	CK	SA	C	EO EC LT-2	CS CS 2Y	CSJ-19 CSJ-20	
839A	SI	ISI-27353 (C7)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839B	SI	ISI-27353 (C8)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
839C	SI	ISI-27353 (C7)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839D	SI	ISI-27353 (B8)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839E	SI	ISI-27353 (C6)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839F	SI	ISI-27353 (B8)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839G	SI	ISI-27353 (C6)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
839H	SI	ISI-27353 (A8)	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
855	SI	ISI-27353 (H4)	SIS Header Safety Relief Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
856B	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Hot Leg NonBIT Header	2(B)	2	GL	MO	C	EO EC PIT	CS CS 2Y	CSJ-21 CSJ-21	
856C	SI	ISI-27353 (F8)	High Head Boron Injection to Loop #4 Cold Leg BIT Header Stop	2(B)	2	GL	MO	O	EO EC PIT	CS CS 2Y	CSJ-22 CSJ-22	
856E	SI	ISI-27353 (F8)	High Head Boron Injection to Loop #1 Cold Leg BIT Header Stop Valve	2(B)	2	GL	MO	O	EO EC PIT	CS CS 2Y	CSJ-22 CSJ-22	
856G	SI	ISI-27353 (E8)	High Head Boron Injection to Loop #1 Hot Leg BIT Header Stop Valve	2(B)	2	GL	MO	C	EO EC PIT	CS CS 2Y	CSJ-21 CSJ-21	
856H	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Cold Leg NonBIT Header	2(B)	2	GL	MO	O	EO EC PIT	CS CS 2Y	CSJ-22 CSJ-22	
856J	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #2 Cold Leg NonBIT Header	2(B)	2	GL	MO	O	EO EC PIT	CS CS 2Y	CSJ-22 CSJ-22	
857A	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #1 Cold Leg NonBIT Header	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
857B	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Hot Leg NonBIT Header	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857C	SI	ISI-27353 (F8)	Boron Injection to Loop #4 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857D	SI	ISI-27353 (F8)	Boron Injection to Loop #2 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857E	SI	ISI-27353 (F8)	Boron Injection to Loop #1 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857F	SI	ISI-27353 (F8)	Boron Injection to Loop #3 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857G	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #1 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857H	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Hot Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857J	SI	ISI-27353 (F8)	Boron Injection to Loop #4 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857K	SI	ISI-27353 (F8)	Boron Injection to Loop #2 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857L	SI	ISI-27353 (F8)	Boron Injection to Loop #1 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857M	SI	ISI-27353 (F8)	Boron Injection to Loop #3 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857N	SI	ISI-27353 (E8)	Boron Injection to Loop #1 Hot Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
857P	SI	ISI-27353 (E8)	Boron Injection to Loop #1 Hot Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12	ROJ-14 ROJ-14
857Q	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857R	SI	ISI-27353 (G8)	High Head Safety Injection to Loop #3 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857S	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #2 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857T	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #2 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857U	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #4 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
857W	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #4 Cold Leg	1(A/C)	2	CK	SA	C	EO EC LT-2	RR 2Y 2Y	VR-12 VR-12 VR-29	ROJ-14 ROJ-14
858A	SI	ISI-27353 (G4)	SIS High Head Injection Test Line Check	2(C)	3/4	CK	SA	C	EO EC	OP OP		
858B	SI	ISI-27353 (G4)	SIS High Head Injection Test Line Check	2(C)	3/4	CK	SA	C	EO EC	OP OP		
880A	SI	ISI-27353 (G5)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880B	SI	ISI-27353 (G5)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880C	SI	ISI-27353 (G5)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880D	SI	ISI-27353 (G5)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880E	SI	ISI-27353 (G6)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880F	SI	ISI-27353 (G5)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
880G	SI	ISI-27353 (G6)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880H	SI	ISI-27353 (G6)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880J	SI	ISI-27353 (G4)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
880K	SI	ISI-27353 (G4)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	C	PIT	2Y		Passive
886A	SI	ISI-27353 (B5)	Recirculating Pump #31 Discharge Check Valve	2(C)	8	CK	SA	C	PEO EC EO-VI	2Y 2Y RR	VR-14 VR-14 VR-14	ROJ-15 ROJ-15 ROJ-15
886B	SI	ISI-27353 (B4)	Recirculating Pump #32 Discharge Check Valve	2(C)	8	CK	SA	C	PEO EC EO-VI	2Y 2Y RR	VR-14 VR-14 VR-14	ROJ-15 ROJ-15 ROJ-15
889A	SI	ISI-27353 (D4)	#32 RHR HX Outlet to Spray Header Stop Valve	2(B)	8	GA	MO	C	EO EC PIT	RR RR RR	VR-15 VR-15 VR-15	ROJ-16 ROJ-16 ROJ-16
889B	SI	ISI-27353 (D4)	#31 RHR HX Outlet to Spray Header Stop Valve	2(B)	8	GA	MO	C	EO EC PIT	RR RR RR	VR-15 VR-15 VR-15	ROJ-16 ROJ-16 ROJ-16
890A	SI	ISI-27353 (D7)	#31 SIS Accumulator Fill	2(B)	1	GL	AO	C	PIT	2Y		Passive
890B	SI	ISI-27353 (D6)	#32 SIS Accumulator Fill	2(B)	1	GL	AO	C	PIT	2Y		Passive
890C	SI	ISI-27353 (D5)	#33 SIS Accumulator Fill	2(B)	1	GL	AO	C	PIT	2Y		Passive
890D	SI	ISI-27353 (D5)	#34 SIS Accumulator Fill	2(B)	1	GL	AO	C	PIT	2Y		Passive
891A	SI	ISI-27353 (E7)	#31 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	C	PIT	2Y		Passive
891B	SI	ISI-27353 (E6)	#32 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	C	PIT	2Y		Passive
891C	SI	ISI-27353 (E6)	#33 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	C	PIT	2Y		Passive
891D	SI	ISI-27353 (E5)	#34 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	C	PIT	2Y		Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
892A	SI	ISI-27353 (E7)	#31 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y	VR-36	
892B	SI	ISI-27353 (E6)	#32 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y	VR-36	
892C	SI	ISI-27353 (E6)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y	VR-36	
892D	SI	ISI-27353 (E5)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y	VR-36	
894A	SI	ISI-27353 (D7)	#31 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	EC PIT	CS 2Y	CSJ-23	
894B	SI	ISI-27353 (D7)	#32 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	EC PIT	CS 2Y	CSJ-23	
894C	SI	ISI-27353 (D6)	#33 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	EC PIT	CS 2Y	CSJ-23	
894D	SI	ISI-27353 (D5)	#34 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	EC PIT	CS 2Y	CSJ-23	
895A	SI	ISI-27353 (C7)	#31 SIS Accumulator Discharge Valve	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-24 CSJ-25 VR-16	 ROJ-17
895B	SI	ISI-27353 (C7)	#32 SIS Accumulator Discharge Valve	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-24 CSJ-25 VR-16	 ROJ-17
895C	SI	ISI-27353 (C6)	#33 SIS Accumulator Discharge Valve	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-24 CSJ-25 VR-16	 ROJ-17
895D	SI	ISI-27353 (C5)	#34 SIS Accumulator Discharge Valve	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-24 CSJ-25 VR-16	 ROJ-17
896A	SI	ISI-27353 (D8)	#31 SIS Accumulator Drain Valve	2(B)	1	GL	AO	C	PIT	2Y		Passive
896B	SI	ISI-27353 (D7)	#32 SIS Accumulator Drain Valve	2(B)	1	GL	AO	C	PIT	2Y		Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
896C	SI	ISI-27353 (D6)	#33 SIS Accumulator Drain Valve	2(B)	1	GL	AO	C	PIT	2Y		Passive
896D	SI	ISI-27353 (D5)	#34 SIS Accumulator Drain Valve	2(B)	1	GL	AO	C	PIT	2Y		Passive
897A	SI	ISI-27353 (C8)	High Head/ Low Head to Loop #1 Cold Leg	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-26 CSJ-26 VR-17	 ROJ-18
897B	SI	ISI-27353 (B8)	High Head/ Low Head to Loop #2 Cold Leg	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-26 CSJ-26 VR-17	 ROJ-18
897C	SI	ISI-27353 (B8)	High Head/ Low Head to Loop #3 Cold Leg	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-26 CSJ-26 VR-17	 ROJ-18
897D	SI	ISI-27353 (A8)	High Head/ Low Head to Loop #4 Cold Leg	1(A/C)	10	CK	SA	C	PEO EC LT-2 EO-NI	CS CS 2Y RR	CSJ-26 CSJ-26 VR-17	 ROJ-18
899A	SI	ISI-27353 (C5)	#32 RHR HX Outlet to Loop #3 & #4 Cold Leg	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
899B	SI	ISI-27353 (C5)	#31 RHR HX Outlet to Loop #1 & #2 Cold Leg	2(B)	8	GA	MO	O	EC PIT	OP 2Y		
HCV-638	SI	ISI-27353 (C4)	RHR HX #31 Outlet Throttle Valve	2(B)	8	BU	MO	O	PIT	2Y		Passive
HCV-640	SI	ISI-27353 (C5)	RHR HX #32 Outlet Throttle Valve	2(B)	8	BU	MO	O	PIT	2Y		Passive

R

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
201	CVCS	ISI-27363 (G6)	Letdown Containment Isolation	NC(A)	2	GA	AO	O	EC FST-C PIT LT-1	CS CS 2Y 5Y	CSJ-27 CSJ-27 VR-33	
202	CVCS	ISI-27363 (G6)	Letdown Containment Isolation	NC(A)	2	GA	AO	O	EC FST-C PIT LT-1	CS CS 2Y 5Y	CSJ-27 CSJ-27 VR-33	
203	CVCS	ISI-27363 (G7)	Letdown Safety Relief	NC(C)	2	SF	SA	C	SP	10Y	VR-36	
204A	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Isolation	NC(B)	3	GL	AO	C	A-EO A-FST-O A-PIT	CS CS 2Y	CSJ-29 CSJ-29	
204B	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Isolation	NC(B)	3	GL	AO	O	A-EO A-FST-O A-PIT	CS CS 2Y	CSJ-29 CSJ-29	
205	CVCS	ISI-27363 (E6)	Charging Containment Isolation	NC(A)	3	GA	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-28 VR-33	
210A	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	CK	SA	C	EO	CS	CSJ-30	Note 1
210B	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	CK	SA	O	EO	OP		Note 1
210C	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	CK	SA	C	EO	CS	CSJ-30	Note 1
210D	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	CK	SA	O	EO.	OP		Note 1
213A	CVCS	ISI-27363 (D7)	Excess Letdown Line Isolation	1(B)	1	GL	AO	C	PIT	2Y		Passive
213B	CVCS	ISI-27363 (D7)	Excess Letdown Line Isolation	1(B)	1	GL	AO	C	PIT	2Y		Passive
218	CVCS	ISI-27363 (D7)	Seal Return Line Safety Relief	NC(C)	3	SF	SA	C	SP	10Y	VR-36	
222	CVCS	ISI-27363 (D6)	RCP Seal Water Return Isolation	NC(A)	4	GA	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
226	CVCS	ISI-27363 (E6)	Charging Containment Isolation	NC(A)	3	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-28 VR-33	
227	CVCS	ISI-27363 (E6)	Charging Line Containment Isolation Valve	NC(A)	3	GL	MA	C	LT-1	5Y	VR-33	Passive
250A	CVCS	ISI-27363 (B8)	#31 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
250B	CVCS	ISI-27363 (B8)	#32 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
250C	CVCS	ISI-27363 (B7)	#33 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
250D	CVCS	ISI-27363 (B7)	#34 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
290	CVCS	ISI-27363 (C5)	Charging Pump Suction from RWST Check	2(C)	4	CK	SA	C	EO	CS	CSJ-32	
332	CVCS	ISI-27363 (B4)	Charging Pump Suction from Emergency Boration Check	NC(C)	2	CK	SA	C	A-EO	2Y		Note 2
333	CVCS	ISI-27363 (B4)	Charging Pump Suction from Emergency Boration Isolation	NC(B)	2	GL	MO	C	A-EO A-PIT	CS 2Y	CSJ-33	
362A	CVCS	ISI-27363 (C3)	#31 Boric Acid Transfer Pump Discharge Check	NC(C)	2	CK	SA	O	A-EO	OP		
362B	CVCS	ISI-27363 (C3)	#32 Boric Acid Transfer Pump Discharge Check	NC(C)	2	CK	SA	O	A-EO	OP		
374	CVCS	ISI-27363 (E7)	Charging Line Check	NC(C)	3	CK	SA	O	A-EO	OP		
401	CVCS	ISI-27363 (C6)	#31 Charging Pump Discharge to Charging Header Check	NC(C)	1 1/2	CK	SA	O	A-EO	OP		
403	CVCS	ISI-27363 (C6)	#32 Charging Pump Discharge to Charging Header Check	NC(C)	1 1/2	CK	SA	O	A-EO	OP		
405	CVCS	ISI-27363 (B6)	#33 Charging Pump Discharge to Charging Header Check	NC(C)	1 1/2	CK	SA	O	A-EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
441	CVCS	ISI-27363 (I38)	#31 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
442	CVCS	ISI-27363 (I38)	#32 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
443	CVCS	ISI-27363 (I37)	#33 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
444	CVCS	ISI-27363 (I37)	#34 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 5Y	CSJ-31 VR-33	
HCV-133	CVCS	ISI-27363 (G7)	RHR / CVCS Cross Connect	2(B)	2	GL	AO	C	PIT	2Y		Passive
LCV-112B	CVCS	ISI-27363 (C5)	Charging Pump Suction from RWST Isolation	2(B)	4	GA	MO	O	EO PIT	CS 2Y	CSJ-34	
LCV-112C	CVCS	ISI-27363 (D5)	Charging Pump Suction from VCT Isolation	NC(B)	4	GA	MO	O	A-EC A-PIT	CS 2Y	CSJ-35	
LCV-459	CVCS	ISI-27363 (F7)	Letdown Line Isolation	NC(B)	3	GL	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-36 CSJ-36	
LCV-460	CVCS	ISI-27363 (F7)	Letdown Line Isolation	NC(B)	3	GL	AO	O	EC FST-C PIT	CS CS 2Y	CSJ-36 CSJ-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
956A	SMPL	ISI-27453 (G7)	Pressurizer Steam Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956B	SMPL	ISI-27453 (G6)	Pressurizer Steam Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956C	SMPL	ISI-27453 (F7)	Pressurizer Liquid Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956D	SMPL	ISI-27453 (F6)	Pressurizer Liquid Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956E	SMPL	ISI-27453 (F7)	RCS Hot Leg Sample Isolation	1(A)	3/8	GL	AO	O	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956F	SMPL	ISI-27453 (F6)	RCS Hot Leg Sample Isolation	1(A)	3/8	GL	AO	O	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956G	SMPL	ISI-27453 (E6)	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	O	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
956H	SMPL	ISI-27453 (E7)	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	O	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	
958	SMPL	ISI-27453 (D7)	RHR Loop Sample Containment Isolation	2(A)	3/4	GL	AO	C	EC	OP		
									FST-C	OP		
									PIT	2Y		
									LT-1	5Y	VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
959	SMPL	ISI-27453 (D6)	RHR Loop Sample Containment Isolation	2(A)	3/8	GL	AO	C	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
990A	SMPL	ISI-27453 (F7)	Recirculating Pump Discharge Sample Isolation	2(A)	1 1/2	GL	MO	C	PIT LT-1	2Y 5Y	 VR-33	Passive
990B	SMPL	ISI-27453 (F6)	Recirculating Pump Discharge Sample Isolation	2(A)	1 1/2	GL	MO	C	PIT LT-1	2Y 5Y	 VR-33	Passive
990C	SMPL	ISI-27453 (D6)	RHR Loop Sample Main Valve	2(A)	3/8	GL	MA	C	LT-1	5Y	VR-33	Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
518	RCS	ISI-27473 (G7)	N2 Supply to PRT Containment Isolation	NC(A/C)	3/4	CK	SA	C	EC LT-1	2Y 5Y	VR-20	ROJ-19
519	RCS	ISI-27473 (F8)	Primary Water Supply to PRT Isolation Valve	NC(A)	3	DA	AO	C	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
535	RCS	ISI-27473 (G1)	PORV Blocking Valve	1(B)	3	GA	MO	O	EO EC PIT	OP OP 2Y		
536	RCS	ISI-27473 (G1)	PORV Blocking Valve	1(B)	3	GA	MO	O	EO EC PIT	OP OP 2Y		
548	RCS	ISI-27473 (G8)	PRT Gas Sample to Analyzer Isolation Valve	NC(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
549	RCS	ISI-27473 (G7)	PRT Gas Sample to Analyzer Isolation Valve	NC(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
550	RCS	ISI-27473 (G8)	N2 Supply to PRT Isolation Valve	NC(A)	3/4	GA	AO	C	EC FST-C PIT LT-1	OP OP 2Y 5Y	VR-1	
552	RCS	ISI-27473 (F8)	Primary Water Supply to PRT Isolation Valve	NC(A)	3	DA	AO	C	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
652	RCS	ISI-27473 (E4)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37 VR-1	
653	RCS	ISI-27473 (E4)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37 VR-1	
654	RCS	ISI-27473 (E5)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37 VR-1	
655	RCS	ISI-27473 (E5)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37 VR-1	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-455C	RCS	ISI-27473 (G1)	PORV	1(B)	3	GL	AO	C	EO PIT	CS 2Y	CSJ-38	
PCV-456	RCS	ISI-27473 (G1)	PORV	1(B)	3	GL	AO	C	EO PIT	CS 2Y	CSJ-38	
PCV-464	RCS	ISI-27473 (G2)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y	VR-36	
PCV-466	RCS	ISI-27473 (G3)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y	VR-36	
PCV-468	RCS	ISI-27473 (G3)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y	VR-36	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
13	SI	ISI-27503 (F7)	Spray Add. Tank Vac. Rel.	3(C)	1	SF	SA	C	SP	10Y	VR-36	
14	SI	ISI-27503 (F7)	Spray Add. Tank Vac. Rel.	3(C)	1	SF	SA	C	SP	10Y	VR-36	
1807B	SI	ISI-27503 (F3)	#32 Safety Injection Pump Min Flow Isolation Valve	2(B)	3/4	GL	MA	O	EO EC	OP OP		
1810	SI	ISI-27503 (F4)	RWST Outlet Isolation Valve	2(B)	8	GA	MO	O	EC PIT	CS 2Y	CSJ-47	
1814A	SI	ISI-27503 (F8)	Containment Pressure Sensing	NC(A)	3/4	GL	MA	O	LT-1	5Y		Passive
1814B	SI	ISI-27503 (E8)	Containment Pressure Sensing	NC(A)	3/4	GL	MA	O	LT-1	5Y		Passive
1814C	SI	ISI-27503 (E8)	Containment Pressure Sensing	NC(A)	3/4	GL	MA	O	LT-1	5Y		Passive
1823	SI	ISI-27503 (G7)	Boric Acid Injection Safety Relief Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
1835A	SI	ISI-27503 (G7)	BIT Outlet Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 5Y 2Y		
1835B	SI	ISI-27503 (G7)	BIT Outlet Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 5Y 2Y		
1838A	SI	ISI-27503 (D4)	Spray Add. to Educt. #31	2(C)	3	CK	SA	C	EO EC-NI	CS RR	CSJ-48 VR-47	ROJ-20
1838B	SI	ISI-27503 (C4)	Spray Add. to Educt. #32	2(C)	3	CK	SA	C	EO EC-NI	CS RR	CSJ-48 VR-47	ROJ-20
1852A	SI	ISI-27503 (G5)	BIT Inlet Valve	2(B)	4	GA	MO	O	PIT	2Y		
1852B	SI	ISI-27503 (G5)	BIT Inlet Valve	2(B)	4	GA	MO	O	PIT	2Y		
1863	SI	ISI-27503 (C4)	RHR Pump Discharge to SIS	2(B)	8	BU	MA	C				Passive
842	SI	ISI-27503 (E3)	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	O	EC PIT	CS 2Y	CSJ-39	

R

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
843	SI	ISI-27503 (E3)	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	O	EC PIT	CS 2Y	CSJ-39	
846	SI	ISI-27503 (G3)	RWST Isolation Valve	2(B)	14	GA	MA	O	EC	CS	CSJ-40	
847	SI	ISI-27503 (F3)	SIS Pump Suction	2(C)	8	CK	SA	C	PEO EO-VI EC	OP RR CS	 VR-21 CSJ-41	 ROJ-21
849A	SI	ISI-27503 (F4)	SIS Pump #31 Discharge Isolation Valve	2(C)	4	CK	SA	C	PEO EO EC	OP RR OP	 VR-22	 ROJ-22
849B	SI	ISI-27503 (G4)	SIS Pump #33 Discharge Isolation Valve	2(C)	4	CK	SA	C	PEO EO EC	OP RR OP	 VR-22	 ROJ-22
850A	SI	ISI-27503 (F5)	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 5Y 2Y	 VR-33	
850C	SI	ISI-27503 (F5)	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 5Y 2Y	 VR-33	
851A	SI	ISI-27503 (F5)	SIS Pump #32 Discharge Isolation Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 5Y 2Y	 VR-33	
851B	SI	ISI-27503 (F5)	SIS Pump #32 Discharge Isolation Valve	2(B)	4	GA	MO	O	EO EC PIT	OP OP 2Y	 	
852A	SI	ISI-27503 (F5)	SIS Pump #32 Discharge Isolation Valve	2(C)	4	CK	SA	C	PEO EO EC	OP RR OP	 VR-22	 ROJ-22
852B	SI	ISI-27503 (G5)	SIS Pump #32 Discharge Isolation Valve	2(C)	4	CK	SA	C	PEO EO EC	OP RR OP	 VR-22	 ROJ-22
859A	SI	ISI-27503 (I17)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	5Y	VR-33	Passive

IR

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
859C	SI	ISI-27503 (H7)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	5Y	VR-33	Passive
866A	SI	ISI-27503 (D6)	Containment Spray Pump #31 Discharge Valve	2(B)	8	GA	MO	C	EO EC PIT	OP OP 2Y		
866B	SI	ISI-27503 (D6)	Containment Spray Pump #32 Discharge Valve	2(B)	8	GA	MO	C	EO EC PIT	OP OP 2Y		
867A	SI	ISI-27503 (D6)	Containment Spray Pump #31 Discharge Valve	2(A/C)	8	CK	SA	C	PEO EO EC LT-1	OP RR 2Y 5Y	 VR-23 VR-23 VR-33	 ROJ-23 ROJ-23
867B	SI	ISI-27503 (D6)	Containment Spray Pump #32 Discharge Valve	2(A/C)	8	CK	SA	C	PEO EO EC LT-1	OP RR 2Y 5Y	 VR-23 VR-23 VR-33	 ROJ-23 ROJ-23
869A	SI	ISI-27503 (D8)	Containment Spray Pump #31 Discharge Valve	2(A)	8	GA	MA	O	EC LT-1	OP 5Y	 VR-33	
869B	SI	ISI-27503 (D8)	Containment Spray Pump #32 Discharge Valve	2(A)	8	GA	MA	O	EC LT-1	OP 5Y	 VR-33	
876A	SI	ISI-27503 (E6)	Spray Additive to Educt.	3(B)	3	DA	AO	C	EO EC FST-O PIT	CS CS CS 2Y	CSJ-42 CSJ-42 CSJ-42	
876B	SI	ISI-27503 (D6)	Spray Additive to Educt.	3(B)	3	DA	AO	C	EO EC FST-O PIT	CS CS CS 2Y	CSJ-42 CSJ-42 CSJ-42	
878A	SI	ISI-27503 (D6)	Containment Spray Pump Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	5Y	VR-33	Passive
878B	SI	ISI-27503 (D6)	Containment Spray Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	5Y	VR-33	Passive
881	SI	ISI-27503 (B3)	RHR Pump Suction	2(C)	12	CK	SA	C	PEO EO	OP RR	 VR-24	 ROJ-24
882	SI	ISI-27503 (B3)	RHR Pump Suction	2(B)	12	GA	MO	O	EC PIT	CS 2Y	CSJ-43	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
883	SI	ISI-27503 (C5)	RHR Pump Discharge to SIS Isolation Valve	2(B)	8	GA	MO	C	EO PIT	CS 2Y	CSJ-44	
884A	SI	ISI-27503 (F4)	SIS Pump to #31 Min-Flow	2(C)	3/4	CK	SA	C	EO	OP		
884B	SI	ISI-27503 (F4)	SIS Pump to #32 Min-Flow	2(C)	3/4	CK	SA	C	EO	OP		
884C	SI	ISI-27503 (G4)	SIS Pump to #33 Min-Flow	2(C)	3/4	CK	SA	C	EO	OP		
885A	SI	ISI-27503 (B8)	Containment Sump RHR Suction Isolation Valve	2(A)	14	GA	MO	C	EO EC PIT LT-1	CS CS 2Y 5Y	CSJ-45 CSJ-45	
885B	SI	ISI-27503 (B7)	Containment Sump RHR Suction Isolation Valve	2(A)	14	GA	MO	C	EO EC PIT LT-1	CS CS 2Y 5Y	CSJ-45 CSJ-45	
887A	SI	ISI-27503 (F4)	#32 SI Pump Suction Isolation Valve	2(B)	6	GA	MO	O	EO EC PIT	OP OP 2Y		
887B	SI	ISI-27503 (F4)	#32 SI Pump Suction Isolation Valve	2(B)	6	GA	MO	O	EO EC PIT	OP OP 2Y		
888A	SI	ISI-27503 (D7)	Low Head to High Head SI Recirculation Stop Valve	2(A)	6	GA	MO	C	EO EC LT-1 PIT	CS CS 5Y 2Y	CSJ-46 CSJ-46	
888B	SI	ISI-27503 (C7)	Low Head to High Head SI Recirculation Stop Valve	2(A)	6	GA	MO	C	EO EC LT-1 PIT	CS CS 5Y 2Y	CSJ-46 CSJ-46	
898	SI	ISI-27503 (F3)	#32 SIS Pump RWST Suction	2(B)	6	GA	MA	C	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
13	CC	ISI-27513 SH1 (E6)	Radiation Monitor Condenser Sample Cooler Supply Isolation	3(B)	3/4	GL	MA	O				Passive
14	CC	ISI-27513 SH1 (C8)	Radiation Monitor Condenser Sample Cooler Return Isolation	3(B)	3/4	GL	MA	O				Passive
1805	CC	ISI-27513 SH1 (C7)	Flash Evaporator Product Cooler CCW Return Isolation Valve	3(B)	4	GA	MA	O				Passive
1850	CC	ISI-27513 SH1 (D6)	Flash Evaporator Product Cooler CCW Supply Isolation Valve	3(B)	4	GA	MA	O				Passive
1870	RHR	ISI-27513 SH1 (G1)	RHR Pump Mini Flow Isolation	2(A)	2	GL	MO	O	EO EC LT-1 PIT	CS CS 5Y 2Y	CSJ-57 CSJ-57 VR-33	
500	CC	ISI-27513 SH1 (D8)	Radiation Monitor Return Isolation Valve	3(B)	2	GL	MA	O				Passive
701A	CC	ISI-27513 SH1 (B3)	City Water to Charging Pumps	3(B)	2	GL	MA	C	EO	OP		
701B	CC	ISI-27513 SH1 (B3)	City Water from Charging Pumps	3(B)	2	GL	MA	C	EO	OP		
732	RHR	ISI-27513 SH1 (H2)	#32 Loop Hot Leg to RHR Pumps Suction Isolation	2(A)	14	GA	MA	C	EO LT-1	OP 5Y		
738A	RHR	ISI-27513 SH1 (F3)	RHR Pump #31 Discharge	2(C)	8	CK	SA	C	PEO EO EC	OP CS OP	CSJ-49	
738B	RHR	ISI-27513 SH1 (G3)	RHR Pump #32 Discharge	2(C)	8	CK	SA	C	PEO EO EC	OP CS OP	CSJ-49	
743	RHR	ISI-27513 SH1 (H2)	RHR Pump Mini Flow Isolation	2(A)	3	GA	MO	O	EO EC LT-1 PIT	CS CS 5Y 2Y	CSJ-50 CSJ-50 VR-33	
744	RHR	ISI-27513 SH1 (H3)	RHR Pump Discharge to RHR HX Isolation	2(A)	12	GA	MO	O	EO EC LT-1 PIT	CS CS 5Y 2Y	CSJ-51 CSJ-51	
750A	CC	ISI-27513 SH1 (C3)	CCW From SIS Pump #31 Cooler Check	3(C)	1	CK	SA	O	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
750B	CC	ISI-27513 SH1 (B3)	CCW From SIS Pump #32 Cooler Check	3(C)	1	CK	SA	O	EO	OP		
750C	CC	ISI-27513 SH1 (A3)	CCW From SIS Pump #33 Cooler Check	3(C)	1	CK	SA	O	EO	OP		
750D	CC	ISI-27513 SH1 (G3)	CCW From RHR Pump #32 Seal	3(C)	1	CK	SA	O	EO	OP		
750E	CC	ISI-27513 SH1 (F3)	CCW From RHR Pump #31 Seal	3(C)	1	CK	SA	O	EO	OP		
751A	CC	ISI-27513 SH1 (H4)	Cooling Water to RHR HX #31	3(C)	12	CK	SA	O	PEO EO EC-NI	OP RR RR	 VR-49	 ROJ-26 ROJ-25
751B	CC	ISI-27513 SH1 (H4)	Cooling Water to RHR HX #32	3(C)	10	CK	SA	O	PEO EO EC-NI	OP RR RR	 VR-49	 ROJ-26 ROJ-25
755A	CC	ISI-27513 SH1 (G5)	Aux. Component Cooling Pump Bypass Check	3(C)	2	CK	SA	O	EC	OP		
755B	CC	ISI-27513 SH1 (G5)	Aux. Component Cooling Pump #31 Discharge Check	3(C)	2	CK	SA	O	EO EC	OP OP		
755C	CC	ISI-27513 SH1 (G5)	Aux. Component Cooling Pump #32 Discharge Check	3(C)	2	CK	SA	O	EO EC	OP OP		
755D	CC	ISI-27513 SH1 (G5)	Aux. Component Cooling Pump Bypass Valve	3(C)	2	CK	SA	O	EC	OP		
755E	CC	ISI-27513 SH1 (G6)	Aux. Component Cooling Pump #33 Discharge Check	3(C)	2	CK	SA	O	EO EC	OP OP		
755F	CC	ISI-27513 SH1 (G6)	Aux. Component Cooling Pump #34 Discharge Check	3(C)	2	CK	SA	O	EO EC	OP OP		
756A	CC	ISI-27513 SH1 (B3)	Charging Pump CCW Supply Isolation	3(B)	3	GA	MA	O	EC	CS	CSJ-52	
756B	CC	ISI-27513 SH1 (B3)	Charging Pump CCW Return Isolation	3(B)	3	GA	MA	O	EC	CS	CSJ-52	
759C	CC	ISI-27513 SH1 (C6)	CCW Pumps Discharge Header Isolation	3(B)	14	GA	MA	O	EC	OP		
759D	CC	ISI-27513 SH1 (B6)	CCW Pumps Discharge Header Isolation	3(B)	14	GA	MA	O	EC	OP		
761A	CC	ISI-27513 SH1 (C6)	Component Cooling Pump #31 Discharge Valve	3(C)	10	CK	SA	O	EO EC	OP OP		

R

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
761B	CC	ISI-27513 SH1 (B6)	Component Cooling Pump #32 Discharge Valve	3(C)	10	CK	SA	O	EO EC	OP OP		
761C	CC	ISI-27513 SH1 (B6)	Component Cooling Pump #33 Discharge Valve	3(C)	10	CK	SA	O	EO EC	OP OP		
766A	CC	ISI-27513 SH1 (B7)	CCW Pumps Suction Header Isolation	3(B)	12	GA	MA	O	EC	OP		
766B	CC	ISI-27513 SH1 (B7)	CCW Pumps Suction Header Isolation	3(B)	12	GA	MA	O	EC	OP		
766C	CC	ISI-27513 SH1 (C5)	CCW Heat Exchanger Cross Connect Isolation	3(B)	12	GA	MA	O	EC	OP		
766D	CC	ISI-27513 SH1 (C5)	CCW Heat Exchanger Cross Connect Isolation	3(B)	12	GA	MA	O	EC	OP		
769	CC	ISI-27513 SH1 (H4)	RCP Seal & Bearing Coolers and Vessel Cooling Support Blocks CCW Supply Isolation	3(A)	6	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-53 VR-33	
784	CC	ISI-27513 SH1 (H7)	RCP Bearing Coolers and Vessel Cooling Support Blocks CCW Return Isolation	3(A)	6	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-54 VR-33	
786	CC	ISI-27513 SH1 (H7)	RCP Bearing Coolers and Vessel Cooling Support Blocks CCW Return Isolation	3(A)	6	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-54 VR-33	
789	CC	ISI-27513 SH1 (G7)	RCP Seal CCW Return Isolation	3(A)	3	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-55 VR-33	
791	CC	ISI-27513 SH1 (H4)	Excess Letdown HX CCW Supply Isolation	3(A)	3	DA	AO	O	EC FST-C LT-1 PIT	OP OP 5Y 2Y	 VR-33	
793	CC	ISI-27513 SH1 (G7)	Excess Letdown HX CCW Return Isolation	3(A)	3	DA	AO	O	EC FST-C LT-1 PIT	OP OP 5Y 2Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
796	CC	ISI-27513 SH1 (H7)	Excess Letdown HX CCW Return Isolation	3(A)	3	DA	AO	O	EC FST-C LT-1 PIT	OP OP 5Y 2Y	 VR-33	
797	CC	ISI-27513 SH1 (H4)	RCP Seal & Bearing Coolers and Vessel Cooling Support Blocks CCW Supply Isolation	3(A)	6	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-53 VR-33	
798	CC	ISI-27513 SH1 (G4)	Excess Letdown HX CCW Supply Isolation	3(A)	3	DA	AO	O	EC FST-C LT-1 PIT	OP OP 5Y 2Y	 VR-33	
799A	CC	ISI-27513 SH1 (C3)	Sample Heat Exhangers CCW Supply Isolation	3(B)	3	GL	MA	O				Passive
799B	CC	ISI-27513 SH1 (C3)	Sample Heat Exhangers CCW Return Isolation	3(B)	3	GL	MA	O				Passive
810	CC	ISI-27513 SH1 (D3)	NRHX Inlet Isolation	3(B)	6	GA	MA	O	EC	CS	CSJ-56	
814	CC	ISI-27513 SH1 (E1)	NRHX Outlet Isolation	3(B)	6	GA	MA	O	EC	CS	CSJ-56	
815A	CC	ISI-27513 SH1 (E7)	S/G Sample Heat Echangers CCW Supply Isolation	3(B)	2	GL	MA	O				Passive
815B	CC	ISI-27513 SH1 (G8)	S/G Sample Heat Echangers CCW Return Isolation	3(B)	2	GL	MA	O				Passive
822A	CC	ISI-27513 SH1 (H8)	#31 RHR HX CCW Outlet Isolation Valve	3(B)	12	GA	MO	C	EO PIT	OP 2Y		
822B	CC	ISI-27513 SH1 (H8)	#32 RHR HX CCW Outlet Isolation Valve	3(B)	12	GA	MO	C	EO PIT	OP 2Y		
837	RHR	ISI-27513 SH1 (G2)	RHR Pump #31 Mini-flow	2(C)	3	CK	SA	C	EO	OP		
838	RHR	ISI-27513 SH1 (H3)	RHR Pump #32 Mini-flow	2(C)	3	CK	SA	C	EO	OP		
FCV-625	CC	ISI-27513 SH1 (H7)	RCP Seal CCW Return Isolation	3(A)	3	GA	MO	O	EC LT-1 PIT	CS 5Y 2Y	CSJ-55 VR-33	
109	FPC	ISI-27513 SH2 (E6)	#32 Spent Fuel Pit Pump Discharge Check	3(C)	8	CK	SA	O	EO EC	OP OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
53	FPC	ISI-27513 SI12 (F6)	#31 Spent Fuel Pit Pump Discharge Check	3(C)	8	CK	SA	O	EO EC	OP OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-1170	HVAC	ISI-40223 (G6)	Containment Building Purge Inside Supply Valve	NC(A)	36	BU	AO	C	EC FST-C PIT LT-1	CS CS 2Y 2Y	VR-1 CSJ-58 VR-33	
FCV-1171	HVAC	ISI-40223 (G5)	Containment Building Purge Outside Supply Valve	NC(A)	36	BU	AO	C	EC FST-C PIT LT-1	CS CS 2Y 2Y	VR-1 CSJ-58 VR-33	
FCV-1172	HVAC	ISI-40223 (G5)	Containment Building Purge Outside Exhaust Valve	NC(A)	36	BU	AO	C	EC FST-C PIT LT-1	CS CS 2Y 2Y	VR-1 CSJ-58 VR-33	
FCV-1173	HVAC	ISI-40223 (G4)	Containment Building Purge Inside Exhaust Valve	NC(A)	36	BU	AO	C	EC FST-C PIT LT-1	CS CS 2Y 2Y	VR-1 CSJ-58 VR-33	
PCV-1190	HVAC	ISI-40223 (B8)	Containment Building Inside Pressure Relief Valve	NC(A)	10	BU	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y	VR-1 VR-33	
PCV-1191	HVAC	ISI-40223 (B7)	Containment Building Outside Pressure Relief 2nd Valve	NC(A)	10	BU	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y	VR-1 VR-33	
PCV-1192	HVAC	ISI-40223 (B7)	Containment Building Outside Pressure Relief 3rd Valve	NC(A)	10	BU	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y	VR-1 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1234	SMPL	ISI-70453 (C7)	Containment Isolation Valve To PASS	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1235	SMPL	ISI-70453 (C7)	Containment Isolation Valve To PASS	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1236	SMPL	ISI-70453 (C8)	Containment Isolation Valve To PASS	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	
PCV-1237	SMPL	ISI-70453 (C8)	Containment Isolation Valve To PASS	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y	 VR-33	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
CB-1	PAEH	N/A	Personnel Airlock Vent to VC Check Valve	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	VR-31 VR-33	ROJ-27
CB-2	PAEH	N/A	Personnel Airlock Vent to VC Check Valve	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	VR-31 VR-33	ROJ-27
CB-3	PAEH	N/A	Personnel Airlock Inner Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive
CB-4	PAEH	N/A	Personnel Airlock Outer Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive
CB-5	PAEH	N/A	Equipment Hatch Airlock Vent to VC Check Valve	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	VR-31 VR-33	ROJ-27
CB-6	PAEH	N/A	Equipment Hatch Airlock Vent to VC Check Valve	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	VR-31 VR-33	ROJ-27
CB-7	PAEH	N/A	Equipment Hatch Airlock Inner Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive
CB-8	PAEH	N/A	Equipment Hatch Airlock Outer Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive

R

NOTES TO APPENDIX B

1. The normal plant operation, the charging alignment establishes valves 204A closed and 204B open. This necessarily allows exercising check valves 210B and 210D during plant operation while 210A and 210C are isolated. In the event that the CVCS system charging alignment is reversed (ie. 204A open and 204B closed), the testing requirements for 210 A-D will be reversed and 210A and 210C will required quarterly exercising while 210B and 210D will be exercised during cold shutdown.

2. Valves that are not within the designated Indian Point 3 ISI boundaries (NC classed) are not under the jurisdiction of ASME B&PV Code, Section XI and associated testing may not necessarily meet all requirements established therein. Relief requests are provided for information only and do not necessarily require approval.

Appendix C

COLD SHUTDOWN VALVE TESTING JUSTIFICATION

APPENDIX C

Cold Shutdown Justifications

CSJ-1

System:	MS	
Drawing:	ISI-20173	
Components:	MS-1-31	31 Steam Generator Main Steam Isolation
	MS-1-32	32 Steam Generator Main Steam Isolation
	MS-1-33	33 Steam Generator Main Steam Isolation
	MS-1-34	34 Steam Generator Main Steam Isolation
Normal Function	Air assisted open to provide flowpaths for steam to the main turbine generator and auxiliaries.	
Safety Function:	Close during MSLB inside containment to prevent blowdown of more than 1 S/G. Close during MSLB downstream of MSIV to isolate steam break. Close during SGTR to isolate faulted S/G.	
Testing Requirement:	EC and FST-C	
CS Justification:	Closing any of these valves during operation would result in an unacceptable transient and plant trip.	

CSJ-2
(Augmented)

System:	MS	
Drawing:	ISI-20173	
Components:	MS-2-31	31 Steam Generator Main Steam Non-Return Check
	MS-2-32	32 Steam Generator Main Steam Non-Return Check
	MS-2-33	33 Steam Generator Main Steam Non-Return Check
	MS-2-34	34 Steam Generator Main Steam Non-Return Check
Normal Function	Open to provide flowpaths for steam to the main turbine generator and auxiliaries.	
Safety Function:	Closes during MSLB upstream of an MSIV to prevent blowdown of more than 1 S/G. Note, no credit is taken in the accident analysis for these valves.	
Testing Requirement:	A-EC	
CS Justification:	Closing any of these valves during operation would result in an unacceptable transient and plant trip.	

APPENDIX C

Cold Shutdown Justifications

CSJ-3

System:	MS	
Drawing:	ISI-20173	
Components:	PCV-1134	31 Steam Generator Main Steam Atmospheric Relief Valve
	PCV-1135	32 Steam Generator Main Steam Atmospheric Relief Valve
	PCV-1136	33 Steam Generator Main Steam Atmospheric Relief Valve
	PCV-1137	34 Steam Generator Main Steam Atmospheric Relief Valve
Normal Function	Provide a means of S/G pressure control if the high pressure steam dump is not available.	
Safety Function:	Open/Close to provide a means of controlling RCS heat rejection when the main condenser is unavailable as a heat sink. Valve is assumed closed during MSLB to not increase the severity of the cooldown transient.	
Testing Requirement:	EO, EC, and FST-C	
CS Justification:	Opening any of these valves during operation would result in an undesirable power transient with the potential for exceeding reactor core power limits.	

CSJ-4

System:	COND	
Drawing:	ISI-20183	
Components:	1158-1	Condensate Storage Tank Low-Level Isolation Valve
Normal Function	Normally open to allow condensate makeup to the main condensers.	
Safety Function:	Closes on low CST level to maintain a minimum of 360,000 gallons for ABFP operation for at least 24 hours following a plant trip from 100% power.	
Testing Requirement:	EC and FST-C	
CS Justification:	Closing either of these valves during operation would result in a loss of condenser makeup.	

APPENDIX C

Cold Shutdown Justifications

CSJ-5

(Augmented)

System:	COND
Drawing:	ISI-20183
Components:	1158-2 Condensate Storage Tank Low-Level Isolation Valve
Normal Function	Normally open to allow condensate makeup to the main condensers.
Safety Function:	Closes on low CST level to maintain a minimum of 360,000 gallons for ABFP operation for at least 24 hours following a plant trip from 100% power.
Testing Requirement:	A-EC and A-FST-C
CS Justification:	Closing either of these valves during operation would result in a loss of condenser makeup.

CSJ-6

System:	COND
Drawing:	ISI-20183
Components:	CT-107 CST Return Line Isolation Check
Normal Function	Opens for main condenser level control and CST makeup
Safety Function:	Closes to isolate ABFP minimum recirculation flow line from non-seismic portions of pipe.
Testing Requirement:	EC
CS Justification:	Closing CT-107 during power operations requires securing condensate recirculation to the CST for an extended period of time.

APPENDIX C

Cold Shutdown Justifications

CSJ-7

System: COND

Drawing: ISI-20183

Components:

CT-26	#31 Aux. Feed Pump Suction From CST
CT-32	#33 Aux. Feed Pump Suction From CST

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: EO

CS Justification: During power operation, exercising these valves to their open position would require operating each motor driven ABFP and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and steam generator nozzles.

CSJ-8

System: FW

Drawing: ISI-20193

Components:

BFD-34	#31 Aux. Feed Pump Discharge Check
BFD-39	#33 Aux. Feed Pump Discharge Check

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: EO

CS Justification: During power operation, exercising these valves to their open position would require operating each motor driven ABFP and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and steam generator nozzles.

APPENDIX C

Cold Shutdown Justifications

CSJ-9

System: FW

Drawing: ISI-20193

Components:

BFD-31	#32 Aux. Feed Pump Discharge Check
BFD-47-1	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-2	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-3	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-4	#32 Aux. Feed Pump Flow Control Valve Discharge Check

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: PEO

CS Justification: During power operation, exercising these valves in the open direction would require operating the turbine driven ABFP and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and steam generator nozzles.

CSJ-10

System: FW

Drawing: ISI-20193

Components:

BFD-35	#31 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-37	#31 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-40	#33 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-42	#33 Aux. Feed Pump Flow Control Valve Discharge Check

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: EO

CS Justification: During power operation, exercising these valves to their open position would require operating each motor driven ABFP and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and steam generator nozzles.

APPENDIX C

Cold Shutdown Justifications

CSJ-11

System: FW

Drawing: ISI-20193

Components:

BFD-47-1	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-2	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-3	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-4	#32 Aux. Feed Pump Flow Control Valve Discharge Check

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: EC

CS Justification: These valves have no position indication devices and verifying closure of these valves by back leakage requires operation of the motor driven 31 and 33 Auxiliary Boiler Feed Pumps with flow established to all steam generators. During plant operation this is not practical due to potential of unacceptable thermal stress in the feedwater piping.

CSJ-12

System: FW

Drawing: ISI-20193

Components:

BFD-6-1	#31 Steam Generator Feedwater Supply Check
BFD-6-2	#32 Steam Generator Feedwater Supply Check
BFD-6-3	#33 Steam Generator Feedwater Supply Check
BFD-6-4	#34 Steam Generator Feedwater Supply Check

Normal Function Normally open to supply main feedwater to the S/Gs.
Provide a passive means to prevent backflow from the S/G's into the feedwater system while the main boiler feed pumps are not operating.

Safety Function: Closes on a main feedwater isolation to ensure auxiliary feedwater is delivered to the S/G's.

Testing Requirement: EC

CS Justification: During normal power operations these valves are open to supply main feedwater to the S/Gs. Closure verification can only be performed during a back leakage test when main feedwater is not required.

APPENDIX C

Cold Shutdown Justifications

CSJ-13

System:	FW	
Drawing:	ISI-20193	
Components:	BFD-67	Aux. Feed Pump Discharge To #32 Steam Generator Check
	BFD-68	Aux. Feed Pump Discharge To #31 Steam Generator Check
	BFD-69	Aux. Feed Pump Discharge To #33 Steam Generator Check
	BFD-70	Aux. Feed Pump Discharge To #34 Steam Generator Check
Normal Function	The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.	
Safety Function:	The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.	
Testing Requirement:	EO	
CS Justification:	During power operation, exercising these valves to their open position would require operating each motor driven ABFP and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and steam generator nozzles.	

CSJ-14
(Augmented)

System:	FW	
Drawing:	ISI-20193	
Components:	FCV-417	#31 Steam Generator Main Feedwater Control
	FCV-427	#32 Steam Generator Main Feedwater Control
	FCV-437	#33 Steam Generator Main Feedwater Control
	FCV-447	#34 Steam Generator Main Feedwater Control
Normal Function	Operate in conjunction with the MBFP speed control system to maintain S/G levels..	
Safety Function:	Closes automatically to mitigate certain accidents.	
Testing Requirement:	A-EC, A-FST-C	
CS Justification:	During normal power operations these valves are open to supply main feedwater to the S/Gs. Closure verification can only be performed during a stroke test when main feedwater is not required.	

APPENDIX C

Cold Shutdown Justifications

CSJ-15

System: SW

Drawing: ISI-20333

Components:

SWN-1-1	31 Service Water Pump Discharge Check
SWN-1-2	32 Service Water Pump Discharge Check
SWN-1-3	33 Service Water Pump Discharge Check
SWN-1-4	34 Service Water Pump Discharge Check
SWN-1-5	35 Service Water Pump Discharge Check
SWN-1-6	36 Service Water Pump Discharge Check

Normal Function Normally open to provide flowpaths from the respective pumps to the various service water headers and heat loads. Close to prevent backflow of service water through idle pumps and the backup service water headers.

Safety Function: Open to provide flowpaths from the respective pumps to the various service water headers and heat loads.

Testing Requirement: EO

CS Justification: A full flow exercise test of these valves requires a major realignment of the service water system. Performing such an evolution during plant operation would constitute an unreasonable burden on the plant staff and could result in upsetting the thermal equilibrium of operating equipment.

CSJ-16

System: SW

Drawing: ISI-20333

Components:

SWN-100-1	34, 35, &36 Service Water Pump Header to Nuclear Services
SWN-100-2	31, 32, &33 Service Water Pump Header to Nuclear Services

Normal Function Normally open to provide flowpaths from the respective pumps to the various service water headers and heat loads. Close to prevent backflow of service water through idle pumps and the backup service water headers.

Safety Function: Open to provide flowpaths from the respective pumps to the various service water headers and heat loads.

Testing Requirement: EO

CS Justification: A full flow exercise test of these valves requires a major realignment of the service water system and probably the operation of three service water pumps in each train. Performing such an evolution during plant operation would constitute an unreasonable burden on the plant staff and could result in upsetting the thermal equilibrium of operating equipment.

APPENDIX C

Cold Shutdown Justifications

CSJ-17

System:	RHR.	
Drawing:	ISI-27203	
Components:	730	RHR Supply from RCS
	731	RHR Supply from RCS
Normal Function	Closed to provide a pressure boundary between the RCS and RHR systems whenever RCS pressure and temperature is above the RHR system design conditions.	
Safety Function:	Close to provide a pressure boundary between the RCS and RHR systems whenever RCS pressure and temperature is above the RHR system design conditions. Open to provide flowpaths for reactor coolant to the suctions of the RHR pumps to effect shutdown cooling recirculation from the RCS to the RHR heat exchangers.	
Testing Requirement:	EO. A-EC	
CS Justification:	These valves are electrically interlocked to prevent opening at reactor pressures above 450 psig and will automatically close if system pressure exceeds 550 psig.	

CSJ-18

System:	RHR	
Drawing:	ISI-27203	
Components:	741	RHR Pump discharge to heat exchanger.
Normal Function	Normally closed to serve as a containment isolation valve.	
Safety Function:	Open to provide a flowpath for reactor coolant from the RHR pumps to the RHR heat exchangers.	
Testing Requirement:	EO	
CS Justification:	The only practical method of opening this valve is by operating an RHR pump with flow to the reactor coolant system; however during normal plant operation the RHR pumps cannot overcome RCS pressure.	

APPENDIX C

Cold Shutdown Justifications

CSJ-19

System: SI

Drawing: ISI-27353

Components:

838A	RHR Return Low Head Injection Loop 1
838B	RHR Return Low Head Injection Loop 2
838C	RHR Return Low Head Injection Loop 3
838D	RHR Return Low Head Injection Loop 4

Normal Function The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Safety Function: The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Testing Requirement: EO

CS Justification: The only practical method of opening these valves is by operating a RHR pump with flow to the reactor coolant system; however, at normal system pressures the RHR pumps cannot overcome RCS pressure.

CSJ-20

System: SI

Drawing: ISI-27353

Components:

838A	RHR Return Low Head Injection Loop 1
838B	RHR Return Low Head Injection Loop 2
838C	RHR Return Low Head Injection Loop 3
838D	RHR Return Low Head Injection Loop 4

Normal Function The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Safety Function: The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Testing Requirement: EC

CS Justification: The only positive means of verifying valve closure is to perform a back leakage test, which is impractical during plant operation.

APPENDIX C

Cold Shutdown Justifications

CSJ-21

System: SI

Drawing: ISI-27353

Components:

856B	High Head Safety Injection to Loop #3 Hot Leg NonBIT Header
856G	High Head Boron Injection to Loop #1 Hot Leg BIT Header Stop Valve

Normal Function De-energized closed during operation.

Safety Function: Opens to provide flowpath from the SIS pumps to the RCS hot leg during hot leg injection. Closed during cold leg injection.

Testing Requirement: EO, EC

CS Justification: These valves are required to be closed and de-energized during operations per IP3 Technical Specification 3.3.A.3.h.

CSJ-22

System: SI

Drawing: ISI-27353

Components:

856C	High Head Boron Injection to Loop #4 Cold Leg BIT Header Stop
856E	High Head Boron Injection to Loop #1 Cold Leg BIT Header Stop
856H	High Head Safety Injection to Loop #3 Cold Leg NonBIT Header Stop
856J	High Head Safety Injection to Loop #2 Cold Leg NonBIT Header Stop

Normal Function Normally open (throttled for flow balancing) to provide flowpaths from the SIS pumps to the RCS cold legs upon initiation of an injection signal.

Safety Function: Maintain their throttled open position to provide flowpaths from the SIS pumps to the RCS cold leg during cold leg injection. Closed for hot leg injection.

Testing Requirement: EO, EC

CS Justification: These valves are preset for throttling and require resetting following any stroking operation. During plant operation this is impractical and undesirable due to the location of the valves inside containment.

APPENDIX C

Cold Shutdown Justifications

CSJ-23

System: SI

Drawing: ISI-27353

Components:

894A	31 SIS Accumulator Discharge Valve
894B	32 SIS Accumulator Discharge Valve
894C	33 SIS Accumulator Discharge Valve
894D	34 SIS Accumulator Discharge Valve

Normal Function Open and de-energized during operation to provide flowpaths from the respective accumulators to the RCS cold legs.

Safety Function: Open to allow accumulator flow to be delivered to the RCS SI actuation when RCS pressure drops below the accumulator operating pressure. Closed to isolate the accumulators and prevent possible gas binding of the steam generators and RHR pumps.

Testing Requirement: EC

CS Justification: During plant operation these valves must be maintained open with their operators de-energized per Technical Specification 3.3.A.3.c. If a valve were to fail to reopen in the course of exercising, a plant shutdown would be required.

CSJ-24

System: SI

Drawing: ISI-27353

Components:

895A	31 SIS Accumulator Discharge Valve
895B	32 SIS Accumulator Discharge Valve
895C	33 SIS Accumulator Discharge Valve
895D	34 SIS Accumulator Discharge Valve

Normal Function The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Safety Function: The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Testing Requirement: PEO

CS Justification: Exercising these valves to the open position requires overcoming the pressure of the reactor coolant system. This cannot be done during normal plant operation since the maximum accumulator pressure is considerably less than that of the reactor coolant system.

APPENDIX C

Cold Shutdown Justifications

CSJ-25

System: SI

Drawing: ISI-27353

Components:

895A	31 SIS Accumulator Discharge Valve
895B	32 SIS Accumulator Discharge Valve
895C	33 SIS Accumulator Discharge Valve
895D	34 SIS Accumulator Discharge Valve

Normal Function The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Safety Function: The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Testing Requirement: EC

CS Justification: The only positive means of verifying valve closure is to perform a back leakage test, which is impractical during plant operation.

CSJ-26

System: SI

Drawing: ISI-27353

Components:

897A	High Head/Low Head to Loop #1 Cold Leg
897B	High Head/Low Head to Loop #2 Cold Leg
897C	High Head/Low Head to Loop #3 Cold Leg
897D	High Head/Low Head to Loop #4 Cold Leg

Normal Function The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Safety Function: The check valves shall provide passive means to isolate the system/RCS pressure boundary interface whenever RCS pressure is at or above the system operating pressure and minimize RCS backleakage to the accumulators to prevent dilution of the borated water contained in these tanks. The valves also allow flow delivery to the RCS when RCS pressure is below system pressure.

Testing Requirement: EC, PEO

CS Justification: The only positive means of verifying valve closure is to perform a back leakage test, which is impractical during plant operation.

APPENDIX C

Cold Shutdown Justifications

CSJ-27

System:	CVCS	
Drawing:	ISI-27363	
Components:	201	Letdown Containment Isolation
	202	Letdown Containment Isolation
Normal Function	Normally open to provide a pathway from the RCS to the CVCS for normal letdown and charging flow.	
Safety Function:	Close for containment isolation.	
Testing Requirement:	EC, FST-C	
CS Justification:	Closure of any of these valves would disrupt CVCS flow and thermal balance and could possibly result in pressurizer level and charging header pressure transients as well as thermal stress to the reactor coolant system piping.	

CSJ-28

System:	CVCS	
Drawing:	ISI-27363	
Components:	205	Charging Containment Isolation
	226	Charging Containment Isolation
Normal Function	Normally open to provide a pathway from the RCS to the CVCS for normal letdown and charging flow.	
Safety Function:	Close for containment isolation.	
Testing Requirement:	EC	
CS Justification:	Closure of any of these valves would disrupt CVCS flow and thermal balance and could possibly result in pressurizer level and charging header pressure transients as well as thermal stress to the reactor coolant system piping.	

APPENDIX C

Cold Shutdown Justifications

CSJ-29
(Augmented)

System:	CVCS	
Drawing:	ISI-27363	
Components:	204A	Charging Line Loop 1 Cold Leg Isolation
	204B	Charging Line Loop 2 Hot Leg Isolation
Normal Function	Normally one valve is open and one valve is closed.	
Safety Function:	These valves open to provide charging and emergency boration flowpaths from the charging pumps to two RCS loops.	
Testing Requirement:	A-EO, A-FST-O	
CS Justification:	These valves are normally aligned with the "A" valve closed and the "B" valve open. Routine opening of the A valve would subject the associated charging line piping to unnecessary thermal cycling and the potential for damage to the piping.	

CSJ-30

System:	CVCS	
Drawing:	ISI-27363	
Components:	210A	Charging Line Loop 2 Hot Leg Check
	210C	Charging Line Loop 2 Hot Leg Check
Normal Function		
Safety Function:	These valves open to provide charging and emergency boration flowpaths from the charging pumps to two RCS loops.	
Testing Requirement:	EO	
CS Justification:	Exercising these valves requires that valve 204A be opened to establish flow to RCS Loop 2. Routine opening of the A valve would subject the associated charging line piping to unnecessary thermal cycling and the potential for damage to the piping.	

APPENDIX C

Cold Shutdown Justifications

CSJ-31

System: CVCS

Drawing: ISI-27363

Components:

222	RCP Seal Water Return Isolation
250A	31 RCP Seal Injection Containment Isolation
250B	32 RCP Seal Injection Containment Isolation
250C	33 RCP Seal Injection Containment Isolation
250D	34 RCP Seal Injection Containment Isolation
441	31 RCP Seal Injection Containment Isolation
442	32 RCP Seal Injection Containment Isolation
443	33 RCP Seal Injection Containment Isolation
444	34 RCP Seal Injection Containment Isolation

Normal Function Open to provide a pathway from the RCP seals to the CVCS system to allow for seal injection, leakoff, and cooling.

Safety Function: These valves close to limit the loss of RCS inventory and for containment isolation.

Testing Requirement: EC

CS Justification: Closing any of these valves during plant operation would disrupt RCP seal injection flow which could result in damage to the reactor coolant pump seals and an associated seal LOCA.

CSJ-32

System: CVCS

Drawing: ISI-27363

Components: 290 Charging Pump Suction From Refueling Water Storage Tank

Normal Function Closed to prevent backflow from the charging pump suction header to the refueling water storage tank.

Safety Function: Opens to allow the charging pumps to take suction directly from the refueling water storage tank.

Testing Requirement: EO

CS Justification: Exercising this valve would require drawing water from the Refueling Water Storage Tank (RWST). During plant operation, this would add negativity into the reactor core and result in undesirable reactor power and temperature transients.

APPENDIX C

Cold Shutdown Justifications

CSJ-33
(Augmented)

System:	CVCS
Drawing:	ISI-27363
Components:	333 Emergency Boration Valve
Normal Function	Closed to isolate the charging pump suction header from the boric acid transfer pumps' discharge header.
Safety Function:	Opens to provide a flowpath from the boric acid transfer pumps' discharge header to the charging pump suction header for emergency boration.
Testing Requirement:	A-EO
CS Justification:	Exercising this valve would allow concentrated boric acid to flow into the suctions of the charging pumps. During plant operation this would add significant negative reactivity into the reactor core and result in undesirable reactor power and temperature transients.

CSJ-34

System:	CVCS
Drawing:	ISI-27363
Components:	LCV-112B Charging Pump Suction From Refueling Water Storage Tank
Normal Function	Closed to prevent backflow from the charging pump suction header to the RWST during emergency boration.
Safety Function:	Opens to allow the charging pumps to take suction directly from the refueling water storage tank.
Testing Requirement:	EO
CS Justification:	Exercising this valve would require drawing water from the Refueling Water Storage Tank (RWST). During plant operation, this would add negativity into the reactor core and result in undesirable reactor power and temperature transients.

APPENDIX C

Cold Shutdown Justifications

CSJ-35
(Augmented)

System:	CVCS
Drawing:	ISI-27363
Components:	LCV-112C Volume Control Tank Outlet Isolation Valve
Normal Function	Open to provide a flowpath from the volume control tank to the charging pumps and maintains proper NPSH for the pumps.
Safety Function:	Closes on low level in the volume control tank to prevent nitrogen gas from entering the suctions of the charging pumps.
Testing Requirement:	A-EC
CS Justification:	Exercising this valve would require drawing water from the Refueling Water Storage Tank (RWST). During plant operation, this would add negativity into the reactor core and result in undesirable reactor power and temperature transients. Additionally, this could cause a level and pressure transient in the Volume Control Tank (VCT), whereas, the VCT relief valve could be challenged.

CSJ-36

System:	CVCS
Drawing:	ISI-27363
Components:	LCV-459 Letdown Line Isolation Valve LCV-460 Letdown Line Isolation Valve
Normal Function	Open to provide a letdown flowpath from the RCS.
Safety Function:	Closes on low level in the pressurizer to conserve RCS inventory.
Testing Requirement:	EC, FST-C
CS Justification:	Closure of these valves would disrupt CVCS flow. This could possibly induce level transients in the pressurizer, as well as, undesirable pressure and thermal stress to the RCS/CVCS piping.

APPENDIX C

Cold Shutdown Justifications

CSJ-37

System:	RCS	
Drawing:	ISI-27473	
Components:	652	RX Vessel Head Vent Valve
	653	RX Vessel Head Vent Valve
	654	RX Vessel Head Vent Valve
	655	RX Vessel Head Vent Valve
Normal Function	Closed to maintain the RCS pressure boundary.	
Safety Function:	Opened as needed to vent non-condensable gases trapped in the reactor vessel head to the pressurizer relief tank.	
Testing Requirement:	EO	
CS Justification:	These reactor vessel head vent valves are closed and de-energized during plant operation to prevent inadvertent operation that could result in a small break LOCA in containment.	

CSJ-38

System:	RCS	
Drawing:	ISI-27473	
Components:	PCV-455C	Power Operated Relief Valve
	PCV-456	Power Operated Relief Valve
Normal Function	Closed to maintain the RCS pressure boundary.	
Safety Function:	Protect the RCS from over-pressurization when the reactor vessel is cooled down (LTOP).	
Testing Requirement:	EO	
CS Justification:	Should a PORV fail to close after exercising to the open position , it would eliminate a significant leakage barrier of the reactor coolant system.	

APPENDIX C

Cold Shutdown Justifications

CSJ-39

System: SI

Drawing: ISI-27503

Components:

842	Safety Injection Pump Miniflow Isolation Valve
843	Safety Injection Pump Miniflow Isolation Valve

Normal Function Open to provide minimum pump flow during low flow operation of the safety injection pumps.

Safety Function: Closed during long term cold leg recirculation to prevent recirculation from the discharge of the SIS pumps back to the refueling water storage tank.

Testing Requirement: EC

CS Justification: These valves must remain open during plant operation in accordance with Technical Specification 3.3.A.3.J. Closure of either of these valves would prevent minimum flow from all of the high head SIS pumps, thus causing them to become inoperable, defeating the HHSI safety function.

CSJ-40

System: SI

Drawing: ISI-27503

Components:

846	Refueling Water Storage Tank Isolation Valve

Normal Function Open to provide a flowpath from the refueling water storage tank to the safeguard system pumps.

Safety Function: In the event it becomes necessary, during recirculation, to pump with the RHR pumps to the suction of the SIS pumps while bypassing the RHR heat exchangers, this valve must be closed to prevent refilling the refueling water storage tank.

Testing Requirement: EC

CS Justification: This valve must remain open and de-energized during plant operation to ensure the operability of the emergency core cooling systems. Closing this valve renders all high head and low head safety injection system inoperable.

APPENDIX C

Cold Shutdown Justifications

CSJ-41

System:	SI	
Drawing:	ISI-27503	
Components:	847	Safety Injection Supply From Refueling Water Storage Tank Check Valve
Normal Function	The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.	
Safety Function:	The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.	
Testing Requirement:	EC	
CS Justification:	Verifying closure of this valve requires isolation of the safety injection flowpaths. This is not permitted while the plant is operating at power, as it would render the safety function inoperable.	

CSJ-42

System:	SI	
Drawing:	ISI-27503	
Components:	876A 876B	Spray Additive Tank Isolation Valve Spray Additive Tank Isolation Valve
Normal Function	Closed. Precludes inadvertent contamination of the containment spray and safety injection systems (RWST) with sodium hydroxide.	
Safety Function:	Opens to provide a flowpath from the Spray Additive Tank to the Containment Spray pump eductors.	
Testing Requirement:	EC, EO, FST-O	
CS Justification:	Opening either of these valves could result in contaminating the Containment Spray and Safety Injection system with sodium hydroxide.	

APPENDIX C

Cold Shutdown Justifications

CSJ-43

System: SI

Drawing: ISI-27503

Components: 882 RHR Pump Suction

Normal Function Open to provide a flowpath from the refueling water storage tank to the suction of the RHR pumps for low pressure safety injection.

Safety Function: Closed to isolate the suction of the RHR pumps and the containment recirculation sump from the RWST and SIS pump suctions during alignment for RHR decay heat removal or in the post-LOCA long term cold leg recirculation cooling mode.

Testing Requirement: EC

CS Justification: This valve must remain open and de-energized during plant operation per IP3 Technical Specification 3.3.A.3.I.

CSJ-44

System: SI

Drawing: ISI-27503

Components: 883 RHR Pump Discharge to SIS Isolation Valve

Normal Function Closed with power removed from its operator to prevent opening and defeating the safety injection function of the RHR pumps.

Safety Function: In the course of an accident, if it becomes necessary to use the RHR pumps in a recirculation mode (alternate to the recirculation pumps) this valve must be opened to align the RHR pump discharge header to the suction of the safety injection pumps.

Testing Requirement: EO

CS Justification: This valve is closed with power removed from its operator during plant operation as required by Technical Specification 3.3.A.3.I.

APPENDIX C

Cold Shutdown Justifications

CSJ-45

System: SI

Drawing: ISI-27503

Components:

885A	Containment Sump RHR Suction Isolation Valve
885B	Containment Sump RHR Suction Isolation Valve

Normal Function Closed for containment isolation and to provide isolation to prevent the accidental draining of the RCS or RWST to the containment sump.

Safety Function: Opened to align the RHR pumps to take suction from the containment sump for post-accident long-term recirculation as a backup for the recirculation pumps.

Testing Requirement: EO, EC

CS Justification: These two valves are in series and valve 885A is inside minicontainment and thus inaccessible during operation. Opening these valves could result in inadvertent draining of the RWST to the containment sump. During power operation this would be an unacceptable transient.

CSJ-46

System: SI

Drawing: ISI-27503

Components:

888A	Low Head to High Head SI Recirculation Stop Valve
888B	Low Head to High Head SI Recirculation Stop Valve

Normal Function Closed for containment isolation.

Safety Function: Opened to provide a flowpath from the recirculation pumps to the safety injection pumps during long term recirculation.

Testing Requirement: EC, EO

CS Justification: Opening 888A/B has the potential to overpressurize the low pressure HHSI suction piping. In order to avoid opening the suctions to all 3 of the high-head SIS pumps to the RHR system while cycling valves 888A&B, valves 1869 A&B both are required to be closed. Having both of these valves closed renders both RHR pumps inoperable by isolating their miniflow path through 1870 and 743.

APPENDIX C

Cold Shutdown Justifications

CSJ-47

System: SI

Drawing: ISI-27503

Components: 1810 Refueling Water Storage Tank Outlet Isolation Valve

Normal Function Open to permit SI pumps to draw suction from the RWST.

Safety Function: Open to provide a flowpath from the refueling water storage tank to the SIS pumps, and close to permit post-LOCA high head recirculation, isolating the flowpath back to the RWST.

Testing Requirement: EC

CS Justification: This valve must remain open and de-energized during plant operation per IP3 Technical Specification 3.3.A.3.I.

CSJ-48

System: SI

Drawing: ISI-27503

Components:
1838A Spray Additive to Eductor 31
1838B Spray Additive to Eductor 32

Normal Function The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Safety Function: The check valves shall provide passive means to isolate nonoperating sections of the system whenever a negative pressure gradient exists across the valve. In addition, the check valves shall also allow system flow when a positive pressure gradient is present.

Testing Requirement: EO

CS Justification: The system lineup and preparations required for opening either of these valves would require defeating the spray additive feature of the containment spray system.

APPENDIX C

Cold Shutdown Justifications

CSJ-49

System: RHR

Drawing: ISI-27513

Components:

738A	RHR Pump Discharge Check Valve
738B	RHR Pump Discharge Check Valve

Normal Function Close to prevent back-flow through an inactive RHR pump.

Safety Function: Open to provide a flowpath from each of the RHR pumps to the RHR discharge header and piping. Close to prevent back flow through an inactive RHR pump during the injection or recirculation phase of a LOCA.

Testing Requirement: EO

CS Justification: Full stroke exercising of these valves requires operating the RHR pumps with flow to the RCS. This is not possible during operation since the RHR pumps are not capable of overcoming RCS pressure.

CSJ-50

System: RHR

Drawing: ISI-27513

Components:

743	RHR Pump Recirculation Line Isolation Valve

Normal Function Open to provide a flowpath for RHR pump minimum flow to afford pump protection when a pump is operating at or near shutoff head.

Safety Function: During an accident scenario there may be occasion where it is desirable to close these valves for containment isolation or cold leg recirculation and then reopen for accident recovery.

Testing Requirement: EO, EC

CS Justification: This valve must remain open and de-energized during plant operation per IP3 Technical Specification 3.3.A.3.m.

APPENDIX C

Cold Shutdown Justifications

CSJ-51

System: RHR

Drawing: ISI-27513

Components: 744 RHR Pump Discharge to RHR Heat Exchanger Isolation

Normal Function Open to provide a flowpath from the RHR pumps to the RHR heat exchangers during cold leg recirculation and LPCI.

Safety Function: Closed for containment isolation and to isolate the RHR pump discharge header when the recirculation pumps are in operation during cold leg recirculation.

Testing Requirement: EO. EC

CS Justification: IP3 Technical Specification 3.3.A.3.i requires that this valve be open with its power supply de-energized during plant operation.

CSJ-52

System: CCW

Drawing: ISI-27513

Components: 756A Charging Pump CCW Supply Isolation
756B Charging Pump CCW Return Isolation

Normal Function Open to provide a flowpath for cooling water circulation through the charging pump coolers.

Safety Function: In the event that the charging pumps are required to operate during an accident when CCW is unavailable, these valves would be closed to allow using the city water supply for cooling.

Testing Requirement: EC

CS Justification: Closing either of these valves isolates cooling water to the charging pumps. This could result in damage rendered to the operating charging pump(s).

APPENDIX C

Cold Shutdown Justifications

CSJ-53

System:	CCW	
Drawing:	ISI-27513	
Components:	769	RCP Seal & Bearing Coolers & Vessel Cooling Support Block CCW Supply Isolation
	797	RCP Seal & Bearing Coolers & Vessel Cooling Support Block CCW Supply Isolation
Normal Function	Open to provide a flowpath for cooling water to the reactor coolant pumps.	
Safety Function:	Containment isolation valves that can also be positioned to isolate non-essential cooling loads under conditions when emergency containment cooling is required and to limit the loss of cooling water should the cooling water piping inside containment rupture.	
Testing Requirement:	EC	
CS Justification:	Closing these valves during plant operation would disrupt cooling to the reactor coolant pumps with the potential for damaging the pumps due to overheating.	

CSJ-54

System:	CCW	
Drawing:	ISI-27513	
Components:	784	RCP Bearing Coolers & Vessel Cooling Support Block CCW Return Isolation
	786	RCP Bearing Coolers & Vessel Cooling Support Block CCW Return Isolation
Normal Function	Open to provide a flowpath for cooling water to the reactor coolant pumps.	
Safety Function:	Close to isolate the non-missile-protected sections of component cooling water piping in containment thus precluding the gross loss of component cooling water inventory as a result of pipe rupture inside the containment building.	
Testing Requirement:	EC	
CS Justification:	Closing these valves during plant operation would disrupt cooling to the reactor coolant pumps with the potential for damaging the pumps due to overheating.	

APPENDIX C

Cold Shutdown Justifications

CSJ-55

System:	CCW	
Drawing:	ISI-27513	
Components:	789	RCP Seal CCW Return Isolation
	FCV-625	RCP Seal CCW Return Isolation
Normal Function	Open to provide a flowpath for cooling water to the reactor coolant pumps.	
Safety Function:	Close automatically (phase B) to isolate the RCP thermal barrier cooling piping inside containment to limit the loss of cooling water should the cooling water piping serving the RCP thermal barriers rupture. Additionally they automatically close on high flow to limit the release of reactor coolant outside containment in the event of a tube rupture in a thermal barrier heat exchanger.	
Testing Requirement:	EC	
CS Justification:	Closing these valves during plant operation would disrupt cooling to the reactor coolant pumps with the potential for damaging the pumps due to overheating.	

CSJ-56

System:	CCW	
Drawing:	ISI-27513	
Components:	810	Non Regenerative Heat Exchanger Cooling Water Supply/Return Isolation
	814	Non Regenerative Heat Exchanger Cooling Water Supply/Return Isolation
Normal Function	Open to provide a flowpath for cooling water supply and return to and from the non-regenerative heat exchanger.	
Safety Function:	Closed to isolate the heat exchanger to reduce heat loads during post accident cooling. During operation with only one CCW pump the non-regenerative heat exchanger must be isolated to prevent pump runout.	
Testing Requirement:	EC	
CS Justification:	Closing these valves results in securing cooling water flow through the non-regenerative heat exchanger. This in turn would require stopping letdown flow to preclude damaging the ion exchangers and possibly overheating other CVCS system components. Such an evolution would result in unacceptable pressurizer level transients and a possible plant trip.	

APPENDIX C

Cold Shutdown Justifications

CSJ-57

System: CCW

Drawing: ISI-27513

Components: 1870 RHR Pump Mini Flow Isolation

Normal Function Open to provide a flowpath for RHR pump minimum flow to afford pump protection when a pump is operating at or near shutoff head.

Safety Function: During an accident scenario there may be occasion where it is desirable to close this valve for containment isolation or cold leg recirculation and then reopen for accident recovery.

Testing Requirement: EC, EO

CS Justification: This valve must remain open and de-energized during plant operation per IP3 Technical Specification 3.3.A.3.m.

CSJ-58

System: HVAC

Drawing: ISI-40223

Components:

FCV-1170	Containment Building Purge Inside Supply Valve
FCV-1171	Containment Building Purge Outside Supply Valve
FCV-1172	Containment Building Purge Outside Supply Valve
FCV-1173	Containment Building Purge Inside Supply Valve

Normal Function Normally closed for containment isolation. Opened to provide flowpaths for supplying and exhausting air to and from the containment building to reduce radioactivity during shutdowns.

Safety Function: Closed for containment isolation.

Testing Requirement: EC, FST-C

CS Justification: These valves must remain closed in all modes except cold shutdown and refueling in accordance with Technical Specification 3.6.D.

APPENDIX C

Cold Shutdown Justifications

CSJ-59
(Augmented)

System:	FW	
Drawing:	ISI-20193	
Components:	FCV-417L	#31 Steam Generator Main Feedwater Low Flow (Bypass) Control
	FCV-427L	#32 Steam Generator Main Feedwater Low Flow (Bypass) Control
	FCV-437L	#33 Steam Generator Main Feedwater Low Flow (Bypass) Control
	FCV-447L	#34 Steam Generator Main Feedwater Low Flow (Bypass) Control
Normal Function	Regulate feed flow to the S/Gs during low power conditions. Normally closed during power operation.	
Safety Function:	Closes automatically to mitigate certain accidents.	
Testing Requirement:	A-EC, A-FST-C	
CS Justification:	During normal power operations these valves are closed. Closure verification can only be performed during a stroke test when main feedwater is not required.	

Appendix D

REFUELING OUTAGE JUSTIFICATION

APPENDIX D

Refueling Outage Justifications

ROJ-1

System: MS

Drawing: ISI-20173

Components:

MS-41	#32 ABFP Steam Supply From 32 Main Steam Line
MS-42	#32 ABFP Steam Supply From 33 Main Steam Line

Function: These stop check valves open to admit steam to the auxiliary feedwater pump turbine. They close to prevent uncontrolled blowdown of steam generators 32 & 33 in the event a steam leak occurs in piping associated with one of these steam generators. A handwheel is provided to allow manual closure of each valve.

RO Justification: The only practical method of verifying proper full-stroke operation of these valves in the open direction is to operate the turbine-driven auxiliary feedwater pump at full rated flow with one of the valves manually closed.

During power operation, full stroke exercising these valves as stated would require injection of cold water into the steam generators. This could result in thermal shock to the feedwater supply piping or the steam generator nozzles, which is highly undesirable.

Partial stroke exercising can be performed by operation of the pump in the recirculation mode.

During a normal shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. The full flow test is impractical to perform during startup from every cold shutdown because the test causes a plant cooldown which significantly delays the startup of the plant. Full flow testing is only required once every two years by technical specifications. Thus, since full flow operation of this pump is the only practical way of exercising this valve to the full-open position, cold shutdown testing is impractical.

Since there are no position indicating devices on these stop check valves for determining disc position, there is no practical method of verifying full closure without operation of the valve handwheel.

Alternate Testing: During normal plant operation, on a quarterly frequency, these valves will be partial stroke exercised to the open position by operation of the pump in the recirculation mode and exercised closed using the installed handwheel.

Every 2 years both the MS-41 and MS-42 valves will be full stroke exercised open during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump 32 full flow testing.

During each reactor refueling outage, at least one of these valves will be disassembled, inspected, and manually exercised closed to verify operability. The schedule will be rotated such that valves are inspected during successive outages. During these inspections, should a disassembled valve prove to be inoperable (i.e. incapable of performing its safety function), then, during the same outage, the other valve will be disassembled, inspected, and exercised to verify operability.

APPENDIX D

Refueling Outage Justifications

ROJ-2

System: COND

Drawing: ISI-20183

Components:

CT-26	#31 Aux. Feed Pump Suction from CST
CT-29-2	#32 Aux. Feed Pump Suction from CST
CT-32	#33 Aux. Feed Pump Suction from CST

Function

These check valves open to provide a flowpath from the Condensate storage tank to the auxiliary feedwater pumps. They close to prevent backflow to the CST when city water is used as a supply to the AFW pumps.

RO Justification:

Exercising these valves closed requires performing a qualitative leak test. City water is used to pressurize downstream of the check valves while back leakage is checked upstream of the check valves. The use of city water requires removing the pumps from service with extensive flushing and sampling during test restoration to ensure the Condensate system is not chemically contaminated.

Alternate Testing

These valves will be exercised closed every two years during Technical Specification 4.8.1.c City Water Valve test.

ROJ-3

System: COND

Drawing: ISI-20183

Components: CT-29-2 #32 Aux. Feed Pump Suction from CST

Function

This check valve opens to provide a flowpath from the Condensate storage tank to the auxiliary feedwater pump. It closes to prevent backflow to the CST when city water is used as a supply to the AFW pump.

RO Justification:

During power operation, exercising this valve to the full-open position would require operating the steam-driven auxiliary feedwater pump injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles, which is highly undesirable.

During a normal shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. The full flow test is impractical to perform during startup from every cold shutdown because the test causes a plant cooldown which significantly delays the startup of the plant. Full flow testing is only required once every two years by technical specifications. Thus, since full flow operation of this pump is the only practical way of exercising this valve to the full-open position, cold shutdown testing is impractical.

Alternate Testing

During quarterly testing of the turbine-driven auxiliary feedwater pump this valve will be partial-stroke tested via the minimum flow recirculation line.

Every 2 years this valve will be full stroke exercised open, during #32 Auxiliary Feedwater Pump full flow testing required by Technical Specifications 4.8.1.a.

APPENDIX D

Refueling Outage Justifications

ROJ-4

System: COND

Drawing: ISI-20183

Components:

PCV-1187	#31 AFWP City Water Makeup Isolation
PCV-1188	#32 AFWP City Water Makeup Isolation
PCV-1189	#33 AFWP City Water Makeup Isolation

Function

These valves are opened to provide a supply of city water to the suction of the AFW pumps as a supplement to the contents of the Condensate storage tank. They are normally closed to isolate the city water from the Condensate system.

RO Justification:

These valves are normally closed to isolate the city water system from the Condensate system. They are only opened in the unlikely event that steam generator makeup is required via the auxiliary feedwater system and the contents of the Condensate storage tank is exhausted.

Opening any of these valves exposes the Condensate system to contaminates that would have an adverse effect on the Condensate and feedwater system chemistry. Following this, it would be required to perform an extensive flushing operation to ensure cleanliness. During plant operation or cold shutdown conditions such a test would result in an unreasonable burden on the plant staff.

Alternate Testing

Every 2 years PCV-1187 through PCV-1189 will be exercised open and fail safe test closed during Technical Specification 4.8.1.c City Water Valve test.

APPENDIX D

Refueling Outage Justifications

ROJ-5

System: FW

Drawing: ISI-20193

Components:

BFD-31	#32 Aux. Feed Pump Discharge Check
BFD-47-1	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-2	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-3	#32 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-47-4	#32 Aux. Feed Pump Flow Control Valve Discharge Check

Function

These valves open to provide flowpaths from the discharge of the turbine-driven auxiliary feedwater pump to the steam generators. Valves BFD 47-1 through BFD 47-4 close to prevent backflow through the idle pump when either of the motor-driven pumps is in operation.

RO Justification:

During power operation, exercising these valves open would require operating the steam-driven auxiliary feedwater pump and injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles, which is highly undesirable.

During a normal shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. The full flow test is impractical to perform during startup from every cold shutdown because the test causes a plant cooldown which significantly delays the startup of the plant. Full flow testing is only required once every two years by technical specifications. Thus, since full flow operation of this pump is the only practical way of exercising these valves, to the full open position, cold shutdown testing is impractical.

Verifying closure of valves BFD-47-1 through BFD-47-4 requires the operation of at least one of the motor-operated AFW pumps with injection to the steam generators. As discussed above, this is not practical during normal plant operation at power.

Alternate Testing

During cold shutdown periods, valves BFD 47-1 through BFD 47-4 will be verified to be closed (CSJ-11).

At a cold shutdown frequency, BFD-31 and BFD-47-1 through BFD-47-4 will be partial-stroke exercised to the open position (CSJ-9).

Every 2 years BFD-31 and BFD-47-1 through BFD-47-4 will be exercised to the fully open position during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump #32 full flow testing.

APPENDIX D

Refueling Outage Justifications

ROJ-6

System: FW

Drawing: ISI-20193

Components:

BFD-35	#31 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-37	#31 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-40	#33 Aux. Feed Pump Flow Control Valve Discharge Check
BFD-42	#33 Aux. Feed Pump Flow Control Valve Discharge Check

Function

These check valves in the auxiliary boiler feedwater piping system open to provide flowpaths from the motor-driven auxiliary feedwater pumps to the steam generators. They close to prevent backflow through the system during periods when an AFW pump is idle.

RO Justification:

During power operation, full-stroke exercising these valves would require operating the auxiliary feedwater pumps injecting cold water into the steam generators. This could result in thermal shock to the feedwater supply piping and the steam generator nozzles, which is highly undesirable.

These valves have no position indication devices and verifying closure of these valves by backleakage requires the operation of turbine-driven AFW Pump #32 with full flow directed to the steam generators. During plant operation this is not practical due the potential of unacceptable thermal stress in the feedwater piping. During a normal shutdown period steam is not available for operation of the steam-driven auxiliary feedwater pump. The full flow test is impractical to perform during startup from every cold shutdown because the test causes a plant cooldown which significantly delays the startup of the plant. Full flow testing is only required once every two years by technical specifications. Thus, since full flow operation of this pump is the only practical way of verifying closure of these valves cold shutdown testing is impractical.

Alternate Testing

During cold shutdown periods, these valves will be full-stroke exercised open (CSJ-10).

Every 2 years these valves will be verified closed during Technical Specification 4.8.1.a, Auxiliary Feedwater Pump #32 full flow testing.

APPENDIX D

Refueling Outage Justifications

ROJ-7

System: AIR

Drawing: ISI-20363

Components:

IA-39	Inboard Containment Isolation
PCV-1228	Outboard Containment Isolation

Function These valves are the containment isolation valves for the instrument air supply to the containment building.

RO Justification: Exercising these valves during operation or cold shutdown requires isolating the instrument air supply to the containment building. This would cause multiple failures of instrumentation and equipment within the containment with accompanying system and plant transients, depending on the status of the reactor plant. In addition, the only positive means of verifying valve closure of IA-39 is to perform a leakage test, which is impractical during a short duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing valve IA-39 during refueling outages.

Alternate Testing Every 2 years PCV-1228 and IA-39 will be exercised, and closure of IA-39 will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33). Fail safe testing for PCV-1228 will be performed every two years.

ROJ-8

System: WD

Drawing: ISI-27193 SH1

Components:

1616	N2 Supply to RCDT #31 Isolation Check

Function This valve is the containment isolation valve for the nitrogen supply to the reactor coolant drain tank.

RO Justification: Verifying closure of this valve during operation or cold shutdown requires access to the containment building (downstream vent path lineup is in the containment building) and performance of a leakage test, which is impractical during operation or a short duration maintenance outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

Alternate Testing Every 2 years 1616 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

APPENDIX D

Refueling Outage Justifications

ROJ-9

System: RHR

Drawing: ISI-27203

Components: 741 RHR Pump Discharge to Heat Exchanger

Function: This valve opens to provide a flowpath from the RHR pumps to the RHR heat exchangers and closes for containment isolation.

RO Justification: Verifying closure of this valve during operation or cold shutdown requires access to the containment building and performance of a leakage test, which is impractical during operation or a short-duration maintenance outage. In addition, closure testing requires interruption of shutdown cooling which is also impractical during cold shutdown.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

Alternate Testing Every 2 years 741 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

ROJ-10

System: CC

Drawing: ISI-27203

Components:

774A	#31 RCP Seal Cooler CCW Inlet Check
774B	#32 RCP Seal Cooler CCW Inlet Check
774C	#33 RCP Seal Cooler CCW Inlet Check
774D	#34 RCP Seal Cooler CCW Inlet Check

Function: In the event of a thermal barrier tube rupture these check valves close to protect the low pressure cooling water piping and associated containment penetration from over-pressure and gross failure.

RO Justification: Verifying closure of these valves requires performance of a backleakage test. Such a test requires containment entry and extensive valve manipulation and lineup changes. This represents a significant and unnecessary burden on the plant staff with no resulting commensurate increase in plant safety.

Alternate Testing During each reactor refueling outage these valves will be verified to close.

APPENDIX D

Refueling Outage Justifications

ROJ-11

System: N2

Drawing: ISI-27233

Components: NNE-1610 Containment N2 Supply Isolation Valve Inside Containment

Function: This valve is the inboard containment isolation valve for the nitrogen supply to the containment building.

RO Justification: The only positive means of verifying valve closure is to perform a leakage test, which is impractical during plant operation or short-duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

Alternate Testing Every 2 years NNE-1610 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

ROJ-12

System: SI

Drawing: ISI-27353

Components:

1802A	Recirculating Pump Discharge Isolation Valve
1802B	Recirculating Pump Discharge Isolation Valve

Function: These valves close to isolate the recirculation pumps from the remainder of the RHR system and open to provide a recirculation flowpath to the RHR heat exchangers.

RO Justification: Exercising these valves during plant operation would result in draining the RHR system piping to the containment sump.

During a normal cold shutdown when the RHR system is in operation, the stroke test requires one RHR heat exchanger to be isolated which makes this an undesirable operation.

Alternate Testing These valves will be exercised open and closed and remote position indication verified during each refueling outage.

APPENDIX D

Refueling Outage Justifications

ROJ-13

System: SI

Drawing: ISI-27353

Components: 1820 Recirculating Pump Min Flow Line Check Valve

Function: This valve opens to provide a pathway for minimum flow from the containment recirculation pumps.

RO Justification: This system is normally maintained in a dry condition except during testing of the recirculation pumps, which is performed during refueling outages. This precludes pump operation during plant operation which is required for testing of this valve.

The test circuit for testing of the recirculation pumps does not contain permanently installed instrumentation for measuring flow through this valve needed to satisfy NRC Generic Letter 89-04.

Because these valves are never operated except for pump testing each refueling and they are maintained in a dry condition, there is a low probability of deterioration.

Alternate Testing Every 2 years the 1820 valve will be full stroke exercised during Technical Specification 4.5.B.1.a Recirculation Pump testing.

A revision to Technical Specification 4.5.B.1.a to extend Recirculation Pump testing from 18 months to 2 years has been approved. Therefore the full stroke testing frequency will be 2 years as well.

APPENDIX D

Refueling Outage Justifications

ROJ-14

System: SI

Drawing: ISI-27353

Components:

857A	High Head Safety Injection to Loop #1 Cold Leg NonBIT Header
857B	High Head Safety Injection to Loop #3 Hot Leg NonBIT Header
857C	Boron Injection to Loop #4 Cold Leg
857D	Boron Injection to Loop #2 Cold Leg
857E	Boron Injection to Loop #1 Cold Leg
857F	Boron Injection to Loop #3 Cold Leg
857G	High Head Safety Injection to Loop #1 Cold Leg
857H	High Head Safety Injection to Loop #3 Hot Leg
857J	Boron Injection to Loop #4 Cold Leg
857K	Boron Injection to Loop #2 Cold Leg
857L	Boron Injection to Loop #1 Cold Leg
857M	Boron Injection to Loop #3 Cold Leg
857N	Boron Injection to Loop #1 Hot Leg
857P	Boron Injection to Loop #1 Hot Leg
857Q	High Head Safety Injection to Loop #3 Cold Leg
857R	High Head Safety Injection to Loop #3 Cold Leg
857S	High Head Safety Injection to Loop #2 Cold Leg
857T	High Head Safety Injection to Loop #2 Cold Leg
857U	High Head Safety Injection to Loop #4 Cold Leg
857W	High Head Safety Injection to Loop #4 Cold Leg

Function: These valves close to provide isolation of the high-head SIS injection system and open to provide a flowpath into the reactor coolant loops.

RO Justification: These valves cannot be exercised during plant operation since the safety injection pumps cannot develop sufficient head to open them against normal operational reactor coolant system pressure.

During cold shutdown, exercising these valves would require operation of the safety injection pumps and injection into the reactor coolant loops. This has the potential of causing low-temperature over-pressurization of the RCS.

Alternate Testing During each reactor refueling outage these valves will be full-stroke exercised open.

Every 2 years valve closure will be verified during Technical Specification 4.5.B.2.c leakage testing (also see Relief Request VR-29).

A revision to Technical Specification 4.5.B.2.c to extend valve leakage testing from 18 months to 2 years has been approved. Therefore the closure verification testing frequency will be 2 years as well.

APPENDIX D

Refueling Outage Justifications

ROJ-15

System: SI

Drawing: ISI-27353

Components:

886A	Recirculating Pump #31 Discharge Check Valve
886B	Recirculating Pump #32 Discharge Check Valve

Function: These valves are installed at the discharge of each recirculation sump pump to prevent backflow through an idle pump.

RO Justification: This system remains drained during all modes of operation except refueling outages when water is provided to test the recirculation pumps. Because there is no full-flow test line, during these tests a minimal amount of water is recirculated to the sump. This flowrate is capable of only partially stroking the discharge valves.

Because these valves are never operated except for pump testing each refueling and they are maintained in a dry condition, there is a low probability of deterioration.

Alternate Testing Every 2 years the 886A and 886B valves will be partial stroke exercised in the open direction during Technical Specification 4.5.B.1.a Recirculation Pump testing.

Every 2 years the 886A and 886B valves will be full stroke exercised in the closed direction during Technical Specification 4.5.B.1.a Recirculation Pump testing.

A revision to Technical Specification 4.5.B.1.a to extend Recirculation Pump testing from 18 months to 2 years has been approved. Therefore the partial stroke testing frequency will be 2 years as well.

During every reactor refueling outage, one of these valves will be disassembled, inspected, and manually exercised open to verify operability. The schedule will be rotated such that valves are inspected during successive outages. During these inspections, should a disassembled valve prove to be inoperable (i.e. incapable of performing its safety function), then, during the same outage, the other valve will be disassembled, inspected, and exercised to verify operability.

APPENDIX D

Refueling Outage Justifications

ROJ-16

System: SI

Drawing: ISI-27353

Components:

889A	#32 RHR HX Outlet to Spray Header Stop Valve
889B	#31 RHR HX Outlet to Spray Header Stop Valve

Function: These valves isolate the containment spray headers from the RHR heat exchangers during normal operation and open to supply cooled water as required during containment spray operation.

RO Justification: During normal plant operation, opening these valves shifts the low head safety injection flow from the reactor coolant system to the containment spray headers; thus, while either of these valves is open, the low-head safety injection system is considered to be inoperable.

During a typical short-duration outage, the RHR heat exchangers are in operation. While in the shutdown cooling mode, the containment spray headers must be isolated from the heat exchangers to preclude discharging water into the containment.

Alternate Testing These valves will be exercised open and closed and remote position indication verified during each reactor refueling outage.

APPENDIX D

Refueling Outage Justifications

ROJ-17

System: SI

Drawing: ISI-27353

Components:

895A	#31 SIS Accumulator Discharge Valve
895B	#32 SIS Accumulator Discharge Valve
895C	#33 SIS Accumulator Discharge Valve
895D	#34 SIS Accumulator Discharge Valve

Function: These valves open to provide safety injection flow into the reactor coolant system cold legs and close to provide pressure isolation between the reactor coolant system and the safety injection accumulators.

RO Justification: Exercising these valves to the open position requires actuation of safety injection and overcoming the pressure of the reactor coolant system. This cannot be done during normal plant operation since the maximum accumulator pressure is considerably less than that of the reactor coolant system.

Full stroking (open) of these valves would require "blowing-down" a pressurized accumulator into a de-pressurized reactor coolant loop. Due to the scope of such an evolution, performance during cold shutdown is not practical. Furthermore, due to the slow speed of the accumulator discharge isolation valves (894 A-D) it is unlikely that full flow can be achieved in this line.

During cold shutdown, partial stroke testing can be accomplished by blowing down a slightly pressurized accumulator. A partial-stroke test followed by a leakrate test adequately ensures that a valve of this type is intact and functioning properly. Any significant deterioration of the valve internals will be discovered during the leaktest.

Alternate Testing During each cold shutdown each valve will be partial-stroke tested open (CSJ-24) followed by a leakage test closed (CSJ-25) as required by Technical Specification 4.5.B.2.d.

During each reactor refueling outage, nonintrusive techniques will be used to verify full stroke open testing in accordance with NUREG-1482, Section 4.1.2.

APPENDIX D

Refueling Outage Justifications

ROJ-18

System: SI

Drawing: ISI-27353

Components:

897A	High Head/Low Head to Loop #1 Cold Leg
897B	High Head/Low Head to Loop #2 Cold Leg
897C	High Head/Low Head to Loop #3 Cold Leg
897D	High Head/Low Head to Loop #4 Cold Leg

Function: These valves supply make-up from the RHR/low head safety injection pumps or the safety injection accumulators to the RCS cold legs and isolate those components from RCS pressure during normal plant operation.

RO Justification: Neither the RHR/low head safety injection pumps nor the safety injection accumulators can provide enough pressure to overcome RCS pressure; thus, exercising these valves open during plant operation is not possible. The only practical means of verifying valve closure is by performing a leakrate test, which is not generally practical during plant operation.

Testing during cold shutdown – initiating safety injection by means of the SIS accumulators presents a potential safety hazard due to the change of causing low-temperature over-pressurization of the reactor coolant system.

Alternate Testing During each cold shutdown each valve will be partial-stroke tested open followed by a leakage rate test closed (CSJ-26) required by Technical Specification 4.5.B.2.d. Note that partial-stroke refers to the flow required by injection via the SIS accumulators; the valves are actually full-flow tested with respect to that associated with the RHR and low-head injection functions.

During each reactor refueling outage, noninstrusive techniques will be used to verify full stroke open testing in accordance with NUREG-1482, Section 4.1.2.

APPENDIX D

Refueling Outage Justifications

ROJ-19

System: RCS

Drawing: ISI-27473

Components: 518 N2 Supply to PRT Containment Isolation

Function: This valve provides a pathway for nitrogen to the pressurizer relief tank and acts as a containment isolation valve.

RO Justification: The only positive means of verifying valve closure is to perform a leakage test, which is impractical during a short-duration outage.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing this valve during refueling outages.

Alternate Testing Every 2 years valve 518 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

ROJ-20

System: SI

Drawing: ISI-27503

Components:

1838A	Spray Add. To Educt. #31
1838B	Spray Add. To Educt. #32

Function: These valves open to provide sodium hydroxide flow to the associated containment spray additive eductor. They close to prevent the flow of water from an idle pump's loop that could effectively dilute the sodium hydroxide solution.

RO Justification: These are simple check valves with no external position indication nor is there a practical method available to verify closure of these valves by observing back-leakage.

These valves are seldom operated; therefore, valve degradation as a result of wear and abuse is not likely.

Alternate Testing During each reactor refueling outage, noninstrusive techniques will be used to verify valve closure in accordance with NUREG-1482, Section 4.1.2.

APPENDIX D

Refueling Outage Justifications

ROJ-21

System: SI

Drawing: ISI-27503

Components: 847 SIS Pump Suction

Function: This valve opens to provide a pathway for water from the refueling water storage tank to the suction of the safety injection pump.

RO Justification: Testing this valve with full accident flow will require injection through both pathways (including through the BIT) using two high-head safety injection pumps operating simultaneously. There is no other full-flow test loop for the safety injection pumps that would provide sufficient flow to verify that this valve is fully opened.

During plant operation this is not possible since the head of the safety injection pumps is insufficient to overcome reactor pressure. While in cold shutdown, provisions related to low-temperature over-pressurization concerns preclude safety injection pump operation.

Alternate Testing This valve will be partial-stroke exercised quarterly with minimum flow. During each reactor refueling outage, this valve will be disassembled, inspected, and manually exercised to verify operability.

ROJ-22

System: SI

Drawing: ISI-27503

Components:

849A	SIS Pump #31 Discharge Isolation Valve
849B	SIS Pump #33 Discharge Isolation Valve
852A	SIS Pump #32 Discharge Isolation Valve
852B	SIS Pump #32 Discharge Isolation Valve

Function: 849A and 852A – These valves open to provide a pathway for water from the discharge of the safety injection pumps directly to the RCS. They close to prevent backflow through an idle pump.

849B and 852B – These valves open to provide a pathway for water from the discharge of the safety injection pumps to the RCS via the boron injection tank. They close to prevent backflow through an idle pump.

RO Justification: Full or partial stroke exercising of these valves requires operation of the safety injection pumps and injection into the reactor coolant system either through the boron injection tank (849B and 852B) or directly (849A and 852A). During plant operation, testing is not possible because the SIS pumps cannot develop sufficient head to overcome the RCS pressure. In cold shutdown condition, operation of the SIS pumps in this mode could potentially result in low temperature over-pressurization of the RCS.

Alternate Testing Valves 849 A&B and 852 A&B will be partial-stroke exercised open quarterly and full-stroke exercised open during each reactor refueling outage.

APPENDIX D

Refueling Outage Justifications

ROJ-23

System: SI

Drawing: ISI-27503

Components:

867A	Containment Spray Pump #31 Discharge Valve
867B	Containment Spray Pump #32 Discharge Valve

Function: These valves open to provide pathways for water from the discharge of the containment spray pumps to the containment spray headers. The valves close to prevent backflow through an idle pump and to provide containment isolation.

RO Justification: The only test circuit to provide sufficient flow needed for full-stroke exercising of these valves without spraying water into the containment building is while filling the refueling cavity prior to refueling. Spool pieces are installed to redirect the containment spray pump discharge flow to the alternate fill line for the cavity fill. The fill line has orifices installed, which limit the flow to values approximately similar to the spray requirements.

In order to verify valve closure a leakage test must be performed.

NUREG 1482 section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing these valves during refueling outages.

Alternate Testing These valves will be partial-stroke exercised (open) quarterly.

The subject valves will be full-stroke exercised open during each refueling outage.

Every 2 years the 867A and 867B valves will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427(a) will be complied with (see also Relief Request VR-33).

APPENDIX D

Refueling Outage Justifications

ROJ-24

System: SI

Drawing: ISI-27503

Components: 881 RHR Pump Suction

Function: This valve opens to provide a pathway for water from the refueling water storage tank to the suction of the residual heat removal pumps.

RO Justification: There is no flow test circuit to provide sufficient flow needed for full-stroke exercising of this valve during normal plant operation.

In cold shutdown, the RHR pumps are used for residual heat removal and there is insufficient letdown capability to recirculate to the RWST, thus, testing this valve is not practical.

Alternate Testing This valve will be partial-stroke exercised open quarterly.

This valve will be full-stroke exercised open during each reactor refueling outage.

ROJ-25

System: SI

Drawing: ISI-27513

Components: 751A Cooling Water to RHR HX #31
751B Cooling Water to RHR HX #32

Function: These check valves open to provide flowpaths from the component cooling water (CCW) system headers to the respective RHR heat exchangers. They close for containment isolation.

RO Justification: There are simple check valves with no external position indication or means of mechanical exercising. Thus, the only practical method of verifying closure is to perform a functional back-leakage test. Performing such a test requires a major realignment of the CCW system. During normal plant operation and cold shutdown conditions placing the plant in such an alignment could jeopardize the plant cooling capacity and capability.

Alternate Testing During each reactor refueling outage nonintrusive techniques will be used to verify closure in accordance with NUREG-1482, Section 4.1.2.

APPENDIX D

Refueling Outage Justifications

ROJ-26

System: CC

Drawing: ISI-27513

Components:

751A	Cooling Water to RHR HX #31
751B	Cooling Water to RHR HX #32

Function: These check valves open to provide flowpaths from the component cooling water (CCW) system headers to the respective RHR heat exchangers. They close for containment isolation.

RO Justification: During power operation and cold shutdown operation, exercising these valves to the open position involves a significant hardship. Specifically there are butterfly valves inside containment which are set at a prescribed location during refueling outages when it is possible to isolate flows to certain components which are required during power operation (i.e. RCP Pumps).
A full flow exercise test of these valves requires a major realignment of the component cooling water system. Performing such an evolution during plant operation or cold shutdown would constitute an unreasonable burden on the plant staff and could result in upsetting the thermal equilibrium of operating equipment.

Alternate Testing These valves will be partial stroke exercised quarterly and full stroke exercised during each refueling outage.

APPENDIX D

Refueling Outage Justifications

ROJ-27

System: PAEH

Drawing: N/A

Components:

CB-1	Personnel Airlock Equalizer
CB-2	Personnel Airlock Equalizer
CB-5	Equipment Hatch Equalizer
CB-6	Equipment Hatch Equalizer

Function: These valves are in the personnel and equipment hatch equalizing lines.

RO Justification: The only positive means of verifying closure of these valves is to perform a leakage test, which is impractical during plant operation or a short-duration outage.

These valves are containment isolation valves that are installed in two pairs (CB-1 & CB-2 and CB-5 and CB-6) in series with no test connections between them. This precludes individually leak testing or exercising each valve. In this configuration, only one valve is required to provide the necessary isolation function.

NUREG 1482 section 4.1.4. "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing", recognizes that the setup and performance limitations may render leak rate testing impractical during power operation and cold shutdowns and allows testing these valves during refueling outages.

Alternate Testing Every 2 years these valves will be exercised and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of Section XI IWV-3426 and 3427 (a) will be complied with (see also Relief Request VR-33).