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Robert J. Barrett
Site Executive Officer

April 25, 2000
IPN-00-032

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Inservice Testing Program

Reference: NYPA letter to NRC (IPN-00-005), "Inservice Testing Program", dated January 18, 2000.

Dear Sir:

The referenced letter submitted Program # 8 of the Indian Point 3 (IP3) Inservice Testing (IST) Program for pumps and valves for NRC review and approval, as required for the third ten-year interval. Subsequently, in a conference telephone call between various NRC and IP3 personnel on March 31, 2000, several items regarding questions formulated during NRC review of the referenced submittal were discussed. As a result of this conversation, NYPA (the Authority) is submitting an updated IST program document as the Attachment to this letter. This Attachment includes minor changes to the previously submitted IST Program # 8.

The subject attachment is an entire updated copy of IST Program # 8, which includes the following changes as agreed to by the NRC staff:
a) Relief request PR-1 is changed and split into three relief requests, PR-1, PR-6 and PR-7. The format for these three new relief requests has been revised to follow that of relief request PR-5.
b) Relief request PR-8 has been added based upon industry experience input. PR-3 has been withdrawn as a result of adding the newly proposed PR-8.
c) Refueling Outage Justifications (ROJ) 1 through 9, 11, 13 through 15, 19, 23 and 27 are changed to clarify that the subject valves are to be tested every refueling outage during the two-year Technical Specification testing.

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d) ROJ-7 through 9, 11, 19, 23 and 27 have their reference to relief request VR-2 deleted. Relief request VR-2 does not exist.

Accordingly, new document page numbering, a new Table of Contents, the replacement of pages 1 of 20 through 20 of 20, the replacement of Appendix D in its entirety and correction of several typographical errors are included in this updated Attachment. We also understand that NRC staff may treat ROJ-1 and ROJ-15 as relief requests.

This updated Attachment of the IP3 IST Program # 8 is submitted for your further review and approval. The third ten-year interval is scheduled to commence July 21, 2000.

The Authority is making no new commitments in this submittal. If you have any questions regarding this letter, please contact Mr. Ken Peters at (914) 736-8029.

Very truly yours,

Robert J. Barrett
Site Executive Officer
Indian Point 3 Nuclear Power Plant

Attachment: Inservice Testing Program # 8

cc: Regional Administrator
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ATTACHMENT to IPN-00-032

IP3 INSERVICE TESTING PROGRAM # 8

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:

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☐ NTSR

PFM-22A Revision: 5

INSERVICE TESTING PROGRAM #8

Robert Dolansky 1/3/00
Writer Date

Kurt Rhode 1/3/00
Reviewer Date

Approved By:
Thomas M. Orlando 1/4/00
Procedure Sponsor, DM/Designee Date

INFORMATION ONLY

Indian Point 3 Performance

MAJOR REVISION

PFM-22A REV. 5
INSERVICE TESTING PROGRAM #8

Table of Contents

1.0 INTRODUCTION

Revision 8 of the Indian Point (Unit 3) (IP3) Inservice Testing Program Plan once approved will be in effect for the applicable duration of the third 120-month (10-year) inspection interval (7/21/99-7/21/09), unless changed for other reasons. The Plan will be updated prior to the start of the fourth 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 ASME/ANSI OM (Parts 6 and 10), OMa 1988 Addenda to ASME/ANSI OM - 1987.

2.0 PROGRAM DEVELOPMENT

ASME/ANSI OM Parts 6 and 10 (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, ASME/ANSI OM Parts 6 and 10 establishes 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 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.

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 OM-6 and OM-10. 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-1, "Design Change Process"). 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
* NRC Generic Letter 87-06, "Periodic Verification of Leak-Tight Integrity of Pressure Isolation Valves."
* NUREG/CP-0152, "Proceedings of the Fourth NRC/ASME Symposium on Valve and Pump Testing."

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.

2.4 Augmented Testing

Pumps and valves that are not within the designated Indian Point 3 ISI boundaries (NC Class) are not under the jurisdiction of ASME/ANSI OM (Parts 6 and 10) and asociated testing may not necessarily meet all requirements established therein. Such components are considered "augmented" in the IST program plan. Relief requests, cold shutdown justifications and refueling outage justifications for augmented components are provided for information only and do not necessarily require approval.

3.0 TESTING PROGRAM FOR PUMPS

3.1 General

3.1.1 Code

This IST Program Plan for pumps meets the requirements of ASME/ANSI OM Part 6 (OM-6). Where these requirements are determined to be impractical, specific requests for relief are included in Section 3.2.

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 OM-6 Table 3 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 OM-6 Table 3.

3.1.4 Instrumentation

Instrumentation used in the IST Program will generally conform to the requirements of OM-6 Section 4.6 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-8 for IST pump testing.

RELIEF REQUEST NO. PR-1

PUMPS:

Service Water; Pump Nos. SWN-31 thru SWN-36.

TEST REQUIREMENT:

Reference values shall be at points of operation readily duplicated during subsequent inservice testing. (OM-6 Part 4.3)

BASIS FOR RELIEF:

The Service Water Pumps (SWPs) provide cooling water from the Hudson River to various heat exchangers in the primary and secondary portions of the plant. The SWPs supply cooling water to various heat exchangers for containment heat removal, long term core cooling and equipment cooling during accident conditions. The SWPs provide cooling to systems where throttling for the purpose of testing can lead to undesirable thermal transients on critical operating equipment.

In order to strictly adhere to the OM-6 code requirements to test the SWPs at a fixed flow each time, valves controlling flow to operating equipment would need to be adjusted. In order to minimize the need to adjust these values, the IST test allows for the measured pump flow to vary over the range of the pump curve to allow for expected variations in system alignments/operating conditions from test to test. In developing the pump curves used in the test, the following elements were used:

1. The pump curves were developed when the pumps were known to operate acceptably. The data used originated from an Engineering Test performed after pump installation.

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

3. A minimum of 5 points from the Engineering Test were used to construct the pump reference curve.

4. The constructed curve uses a range of flows which encompasses the normally expected flow observed from the Engineering 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 range of the pump curve being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

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.

RELIEF REQUEST NO. PR-1 (continued)

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).

RELIEF REQUEST NO. PR-2

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. (OM-6 Section 5.1)

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 OM-6 Table 3 establishing acceptance criteria. During the test, the test quantities shown in OM-6 Table 2 shall be measured and recorded.

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 this pump stands 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 OM-6 Table 3 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 OM-6 Table 3. This agrees with the guidance provided in NRC Generic Letter 89-04, Position 9.

RELIEF REQUEST NO. PR-3

WITHDRAWN

RELIEF REQUEST NO. PR-4

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. (OM-6, Section 4.6.2.1)

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 4% error allowance applied to both the suction and discharge pressure instruments (Ref OM-6, Table 1).

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-5

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. (OM-6 Part 4.3)

BASIS 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 OM-6 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-5 (continued)

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).

RELIEF REQUEST NO. PR-6

PUMPS:

Component Cooling Water; Pump Nos. CCW-31, CCW-32, CCW-33

TEST REQUIREMENT:

Reference values shall be at points of operation readily duplicated during subsequent inservice testing. (OM-6 Part 4.3)

BASIS FOR RELIEF:

The Component Cooling Water (CCW) pumps circulate CCW through the component cooling loops to meet or exceed the minimum required cooling flows to in service components. The CCW pumps provide cooling to systems where throttling for the purpose of testing can lead to undesirable thermal transients on critical operating equipment.

In order to strictly adhere to the OM-6 code requirements to test the CCW pumps at a fixed flow each time, valves controlling flow to operating equipment would 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 the range of the pump curve to allow for expected variations in system alignments/operating conditions from test to test. In developing the pump curves used in the test, the following elements were used:

1. The pump curves were developed or the manufacturer's pump curve validated when the pumps were known to operate acceptably.

2. The instruments used either met or exceeded the Code required accuracy.

3. A minimum of 5 points were used to construct the pump reference curve.

4. The constructed curve uses a range of flows which encompasses the normally expected flow.

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 range of the pump curve being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

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.

RELIEF REQUEST NO. PR-6 (continued)

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).

RELIEF REQUEST NO. PR-7

PUMPS:

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. (OM-6 Part 4.3)

BASIS FOR RELIEF:

The Residual Heat Removal (RHR) pumps circulate RCS water through the RHR system during plant cooldown, cold shutdown and refueling operations. The RHR pumps provide emergency core cooling during the injection phase of a LOCA and provide backup to the recirculation pumps during the recirculation phase of a LOCA. During plant shutdown, throttling RHR flow for testing creates unacceptable core cooling and mixing complications. When the plant is not in a shutdown condition, RHR pump testing is performed through a miniflow path at a fixed resistance reference point.

In order to strictly adhere to the OM-6 code requirements to test the RHR pumps at a fixed flow each time, valves controlling shutdown cooling flow would need to be adjusted. In order to minimize the need to adjust these values, the IST test allows for the measured pump flow to vary over the range of the pump curve to allow for expected variations in system alignments/operating conditions from test to test. In developing the pump curves used in the test, the following elements were used:

1. The pump curves were developed or the manufacturer's pump curve validated when the pumps were known to operate acceptably.

2. The instruments used either met or exceeded the Code required accuracy.

3. A minimum of 5 points were used to construct the pump reference curve.

4. The constructed curve uses a range of flows which encompasses the normally expected flow.

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 range of the pump curve being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

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.

RELIEF REQUEST NO. PR-7 (continued)

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). Curve comparison will be used only when the plant is in a cold shutdown or cooldown configuration.

RELIEF REQUEST NO. PR-8

PUMPS

All pumps in the Program.

TEST REQUIREMENT

Acceptance criteria requirements of OMa-1988, Part 6 paragraph 6.1.

BASIS FOR RELIEF

OM Part 6 requires doubling of test frequency or declaring a pump inoperable upon reaching the Alert or Required Action Ranges, respectively. In some cases, where a pump has sufficient excess margin to its safety analysis limits and data trending and analysis only indicate a gradual decrease in pump performance, the requirements of OM Part 6 may result in taking unnecessary corrective action.

Paragraph ISTB 4.6 of the 1995 ASME OM Code allows the ability to perform an analysis of the pump and establish new reference values. Paragraph ISTB 6.2.2 states that if the measured test parameter values fall within the required action range...the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition corrected, or an analysis of the pump is performed and new reference values are established in accordance with Paragraph ISTB 4.6. Paragraph ISTB 4.6 requires that the analysis include both a pump level and a system level evaluation of operational readiness, the cause of the change in pump performance, and an evaluation of all trends indicated by available data.

Paragraph ISTB 6.2.1 states that if the measured test parameter values fall within the alert range...the frequency of testing specified in paragraph ISTB 5.1 shall be doubled until the cause of the deviation is determined and the condition is corrected. Paragraph ISTB 4.6 allows a new set of reference values to be established when a pump's parameters are in either the alert or required action ranges using the analysis discussed above.

If an analysis, in accordance with paragraph ISTB 4.6, supports establishing new reference values in lieu of correcting the condition, then using the requirements of ISTB 4.6 as an alternative to OM(6)-6.1 would provide an acceptable level of quality and safety.

Note: Where ISTB 4.6, ISTB 6.2.1 and ISTB 6.2.2 refer to ISTB tables, OM(6) Table 3 would be inserted. All references to ISTB in the preceding paragraphs refer to the 1995 ASME OM Code.

ALTERNATE TESTING

If supported by an analysis that meets the requirements of ISTB 4.6, corrective action may be to establish new reference values for pumps which fall within the alert or action ranges.

4.0 TESTING PROGRAM FOR VALVES

4.1 General

4.1.1 Code

This IST Program Plan for valves meets the requirements of ASME/ANSI OM-10. Where these requirements are determined to be impractical, specific requests for relief are included in Section 4.2.

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 train 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 OM-10, Section 4.1.

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 OM-10, Section 4.2.1.9 except where relief is granted.

4.1.9 Check Valve Disassembly

When a check valve is disassembled in lieu of exercising (as documented in the program plan), 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 request VR-1 for IST valve testing.

RELIEF REQUEST NO. VR-1

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 OM-10 Section 4.2.2.

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.

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.

PFM-22A REV. 5
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-5
ACC-CW-32	SIS PUMP CIRC WATER PUMP #32	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-5
ACC-CW-33	SIS PUMP CIRC WATER PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-5
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	Y	N	Q/R	PR-2
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-4 and PR-8 applies to all pumps.

PFM-22A REV. 5
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-6
CCW-32	COMPONENT COOLING PUMP #32	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-6
CCW-33	COMPONENT COOLING PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-6
CS-31	CONTAINMENT SPRAY PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q	
CS-32	CONTAINMENT SPRAY PUMP #32	2	ISI 27503	NA	Y	Y	Y	Y	N	Q	
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	Y	N	Y	N	R	
REC-32	RECIRCULATION PUMP #32	2	ISI 27353	NA	Y	Y	N	Y	N	R	
RHR-31	RESIDUAL HEAT REMOVAL PUMP #31	2	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-7*
RHR-32	RESIDUAL HEAT REMOVAL PUMP #32	2	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-7*
SIS-31	SAFETY INJECTION PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q	
SIS-32	SAFETY INJECTION PUMP #32	2	ISI 27503	NA	Y	Y	Y	Y	N	Q	
SIS-33	SAFETY INJECTION PUMP #33	2	ISI 27503	NA	Y	Y	Y	Y	N	Q	
SWN-31	SERVICE WATER PUMP #31	3	ISI 20333-1	NA	Y	Y	Y	Y	N	Q	PR-1
SWN-32	SERVICE WATER PUMP #32	3	ISI 20333-1	NA	Y	Y	Y	Y	N	Q	PR-1
SWN-33	SERVICE WATER PUMP #33	3	ISI 20333-1	NA	Y	Y	Y	Y	N	Q	PR-1
SWN-34	SERVICE WATER PUMP #34	3	ISI 20333-1	NA	Y	Y	Y	Y	N	Q	PR-1
SWN-35	SERVICE WATER PUMP #35	3	ISI 20333-1	NA	Y	Y	Y	Y	N	Q	PR-1
SWN-36	SERVICE WATER PUMP #36	3	ISI 20333-1	NA	Y	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
LT-3	Leakage test - non-Appendix J and non-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 4.2 for relief requests. Cold Shutdown justifications are designated CSJ-XX. Refer to Appendix C for cold shutdown justifications. Refueling Outage justifications are designated ROJ-XX. Refer to Appendix D for refueling outage justifications.

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

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqmt	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	 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	 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		
MS-45-2	MS	ISI-20173 (H8)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-45-3	MS	ISI-20173 (E8)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-45-4	MS	ISI-20173 (D8)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		

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		
MS-46-2	MS	ISI-20173 (H8)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-46-3	MS	ISI-20173 (E8)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-46-4	MS	ISI-20173 (D8)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-47-1	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-47-2	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-47-3	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-47-4	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-48-1	MS	ISI-20173 (F7)	#31 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-48-2	MS	ISI-20173 (H7)	#32 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-48-3	MS	ISI-20173 (E7)	#33 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-48-4	MS	ISI-20173 (D7)	#34 Steam Generator Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-49-1	MS	ISI-20173 (F7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-49-2	MS	ISI-20173 (H7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-49-3	MS	ISI-20173 (E7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-49-4	MS	ISI-20173 (D7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	5Y		
MS-52	MS	ISI-20173 (H6)	#32 ABFP Steam Pressure Reducing Staion Relief	3(C)	4	SF	SA	C	SP	10Y		
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	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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		

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 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		
CT-29-1	COND	ISI-20183 (F7)	#31 Aux. Feed Pump City Water Supply Check	NC(C)	6	CK	SA	C	A-PEO	2Y		
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	 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		
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 ROJ-2	
CT-35-1	COND	ISI-20183 (E8)	#33 AFW Pump Suction Relief	3(C)	3/4	SF	SA	C	SP	10Y		
CT-35-2	COND	ISI-20183 (E8)	#31 AFW Pump Suction Relief	3(C)	3/4	SF	SA	C	SP	10Y		
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		
PCV-1187	COND	ISI-20183 (F7)	#31 AFWP City Water Makeup Isolation	3(B)	6	GA	AO	C	EO PIT	2Y 2Y	ROJ-4	

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

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 A-PIT	RR 2Y		
BFD-2-32	FW	ISI-20193 (F3)	#32 Boiler Feed Pump Discharge MOV	NC	20	GA	MO	O	A-EC A-PIT	RR 2Y		
BFD-31	FW	ISI-20193 (B5)	#32 Aux. Feed Pump Discharge Check	3(C)	6	CK	SA	C	EO PEO	2Y CS	ROJ-5 CSJ-9	
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 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 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 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 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	ROJ-5 CSJ-11 CSJ-9	
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	ROJ-5 CSJ-11 CSJ-9	
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	ROJ-5 CSJ-11 CSJ-9	
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	ROJ-5 CSJ-11 CSJ-9	
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 EC	CS OP	CSJ-13	
BFD-68	FW	ISI-20193 (D8)	Aux. Feed Pump Discharge To #31 Steam Generator Check	2(C)	4	CK	SA	C	EO EC	CS OP	CSJ-13	
BFD-69	FW	ISI-20193 (G8)	Aux. Feed Pump Discharge To #33 Steam Generator Check	2(C)	4	CK	SA	C	EO EC	CS OP	CSJ-13	
BFD-70	FW	ISI-20193 (F8)	Aux. Feed Pump Discharge To #34 Steam Generator Check	2(C)	4	CK	SA	C	EO EC	CS OP	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		
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)	Containment Isolation Valve From SJAE's	NC(A)	4	GA	AO	C	PIT LT-1	2Y 5Y		Passive Note 2
PCV-1230	CAR	ISI-20253 (E8)	Containment Isolation Valve From SJAE's	NC(A)	4	GA	AO	C	PIT LT-1	2Y 5Y		Passive Note 2

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-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-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	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	
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-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 EO	OP OP		
SWN-9-2	RW	ISI-20333 (C2)	#32 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC EO	OP OP		
SWN-9-3	RW	ISI-20333 (C2)	#33 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC EO	OP OP		
SWN-9-4	RW	ISI-20333 (C2)	#34 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC EO	OP OP		
SWN-9-5	RW	ISI-20333 (C2)	#35 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC EO	OP OP		
SWN-9-6	RW	ISI-20333 (C2)	#36 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC EO	OP 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 for Station Air Supply	NC(A)	2	DA	MA	C	LT-1	2Y		Passive Note 2
SA-24-2	AIR	ISI-20353 (F6)	Containment Isolation for Station Air Supply	NC(A)	2	DA	MA	C	LT-1	2Y		Passive Note 2

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	ROJ-7	Note 2
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	ROJ-7 ROJ-7	Note 2

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)	Post Accident Containment Vent Isolation	NC(A)	2	DA	MA	C	LT-1	5Y		Passive Note 2
PS-7	SMPL	ISI-26533 (G7)	Post Accident Containment Vent Isolation	NC(A)	3	DA	MA	C	LT-1	5Y		Passive Note 2
PS-8	SMPL	ISI-26533 (G7)	Post Accident Containment Vent Isolation	NC(A)	3	DA	MA	C	LT-1	5Y		Passive Note 2
PS-9	SMPL	ISI-26533 (F7)	Post Accident Containment Vent Isolation	NC(A)	3	DA	MA	C	LT-1	5Y		Passive Note 2
SOV-506	SMPL	ISI-26533 (E6)	#33 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-507	SMPL	ISI-26533 (E5)	#34 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-508	SMPL	ISI-26533 (D5)	#31 Fan Cooler Unit Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-509	SMPL	ISI-26533 (E4)	#31,#33,#34 Fan Cooler Units Sample to H2 Analyzer B Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-510	SMPL	ISI-26533 (C4)	H2 Analyzer A Return to Containment Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SOV-511	SMPL	ISI-26533 (B5)	H2 Analyzer A Return to Containment Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-512	SMPL	ISI-26533 (D5)	#32 Fan Cooler Unit Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-513	SMPL	ISI-26533 (C5)	#35 Fan Cooler Unit Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-514	SMPL	ISI-26533 (D4)	#32,#35 Fan Cooler Units Sample to H2 Analyzer A Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-515	SMPL	ISI-26533 (B4)	H2 Analyzer B Sample Return to Containment Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2
SOV-516	SMPL	ISI-26533 (B5)	H2 Analyzer B Sample Return to Containment Isolation	NC(A)	1	GL	SO	C	EO EC FST-C LT-1 PIT	OP OP OP 5Y 2Y		Note 2

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		Note 2
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	ROJ-8	Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2

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 2Y		Note 2

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		
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	OP CS 2Y	 CSJ-18 ROJ-9	
745A	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	MO	O	EO EC PIT	OP OP 2Y		
745B	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	MO	O	EO EC PIT	OP OP 2Y		
774A	CC	ISI-27203 (F7)	#31 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	ROJ-10	
774B	CC	ISI-27203 (F6)	#32 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	ROJ-10	
774C	CC	ISI-27203 (F4)	#33 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	ROJ-10	
774D	CC	ISI-27203 (F3)	#34 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	O	EC	RR	ROJ-10	
782	CC	ISI-27203 (B8)	RCP/Sup. Block Ret. Relief Valve	3(C)	3	SF	SA	C	SP	10Y		
783A	CC	ISI-27203 (F6)	#31 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y		
783B	CC	ISI-27203 (F6)	#32 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y		
783C	CC	ISI-27203 (F6)	#33 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y		
783D	CC	ISI-27203 (F6)	#34 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y		

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		
819A	CC	ISI-27203 (D6)	RHR HX #31 Shell-side Relief Valve	3(C)	1 1/2	SF	SA	C	SP	10Y		
819B	CC	ISI-27203 (D7)	RHR HX #32 Shell-side Relief Valve	3(C)	1 1/2	SF	SA	C	SP	10Y		
821F	CC	ISI-27203 (E7)	RV Cooling Support Blocks Safety Relief Valve	3(C)	3/4	SF	SA	C	SP	10Y		

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		
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		
SWN-29	RW	ISI-27223 (B4)	#31, 32, & 33 Service Water Pump Supply to Emergency Diesel Coolers	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	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-36-1	RW	ISI-27223 (E3)	CCW HX #31 Outlet Pressure Relief	3(C)	3/4	SF	SA	C	SP	10Y		
SWN-36-2	RW	ISI-27223 (F3)	CCW HX #32 Outlet Pressure Relief	3(C)	3/4	SF	SA	C	SP	10Y		
SWN-38	RW	ISI-27223 (D6)	FCU Supply Isolation	3(B)	18	BU	MA	O/C	EO EC	OP OP		
SWN-39	RW	ISI-27223 (D5)	FCU Supply Isolation	3(B)	18	BU	MA	O/C	EO EC	OP OP		
SWN-40-1	RW	ISI-27223 (E6)	FCU Header Cross Tie Isolation	3(B)	18	BU	MA	O/C	EC	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SWN-40-2	RW	ISI-27223 (E6)	FCU Header Cross Tie Isolation	3(B)	18	BU	MA	O/C	EC	OP		
SWN-41-1	RW	ISI-27223 (E5)	#31 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-41-2	RW	ISI-27223 (E5)	#32 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-41-3	RW	ISI-27223 (E6)	#33 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-41-4	RW	ISI-27223 (E6)	#34 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-41-5	RW	ISI-27223 (E4)	#35 FCU Supply Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-42-1	RW	ISI-27223 (E5)	#31 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-3	10Y 2Y		
SWN-42-2	RW	ISI-27223 (E5)	#32 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-3	10Y 2Y		
SWN-42-3	RW	ISI-27223 (E6)	#33 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-3	10Y 2Y		
SWN-42-4	RW	ISI-27223 (E6)	#34 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-3	10Y 2Y		
SWN-42-5	RW	ISI-27223 (E4)	#35 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	C	SP LT-3	10Y 2Y		
SWN-43-1	RW	ISI-27223 (E5)	#31 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-3	2Y		Passive
SWN-43-2	RW	ISI-27223 (E4)	#32 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-3	2Y		Passive
SWN-43-3	RW	ISI-27223 (E6)	#33 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-3	2Y		Passive
SWN-43-4	RW	ISI-27223 (E6)	#34 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-3	2Y		Passive
SWN-43-5	RW	ISI-27223 (E4)	#35 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-3	2Y		Passive
SWN-44-1	RW	ISI-27223 (F5)	#31 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-44-2	RW	ISI-27223 (F4)	#32 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-44-3	RW	ISI-27223 (F6)	#33 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
SWN-44-4	RW	ISI-27223 (F6)	#34 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-44-5	RW	ISI-27223 (F4)	#35 FCU Outlet Isolation	3(A)	10	BU	MA	O	EC LT-3	OP 2Y		
SWN-51-1	RW	ISI-27223 (F4)	#31 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-3	OP 2Y		
SWN-51-2	RW	ISI-27223 (F4)	#32 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-3	OP 2Y		
SWN-51-3	RW	ISI-27223 (F4)	#33 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-3	OP 2Y		
SWN-51-4	RW	ISI-27223 (F4)	#34 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-3	OP 2Y		
SWN-51-5	RW	ISI-27223 (F4)	#35 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	O	EC LT-3	OP 2Y		
SWN-62-1	RW	ISI-27223 (C3)	#31, 32, & 33 Service Water Pump Supply to Emergency Diesel #31 Cooler	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	3(B)	4	BU	MA	O	EO EC	OP OP		
SWN-63-1	RW	ISI-27223 (C4)	31 EDG Cooler Inlet Relief	3(C)	3/4	SF	SA	C	SP	10Y		
SWN-63-2	RW	ISI-27223 (B4)	32 EDG Cooler Inlet Relief	3(C)	3/4	SF	SA	C	SP	10Y		
SWN-63-3	RW	ISI-27223 (B4)	33 EDG Cooler Inlet Relief	3(C)	3/4	SF	SA	C	SP	10Y		
SWN-71-1	RW	ISI-27223 (F5)	#31 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-3	OP 2Y		
SWN-71-2	RW	ISI-27223 (F5)	#32 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-3	OP 2Y		
SWN-71-3	RW	ISI-27223 (F5)	#33 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-3	OP 2Y		
SWN-71-4	RW	ISI-27223 (F5)	#34 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-3	OP 2Y		
SWN-71-5	RW	ISI-27223 (F5)	#35 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	O	EC LT-3	OP 2Y		
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		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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		
17	N2	ISI-27233 (E7)	PCV-456 Accumulator Check	NC(C)	3/4	CK	SA	C	A-EC	RR		
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		Note 2
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	ROJ-11	Note 2
NNE-1864	N2	ISI-27233 (H5)	Codensate Storage Tank Breather Valve	NC(C)	12	SF	SA	C	A-SP	10Y		
NNE-1865	N2	ISI-27233 (H5)	Codensate Storage Tank Breather Valve	NC(C)	12	SF	SA	C	A-SP	10Y		

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	2Y 2Y		Passive Note 2
DW-AOV-2	DW	ISI-27243 (F5)	Demin Water To Containment Isolation	NC(A)	2	GA	AO	C	LT-1 PIT	2Y 2Y		Passive Note 2

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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2

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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2

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 PIT	RR RR	ROJ-12 ROJ-12	
1802B	SI	ISI-27353 (B4)	Recirculating Pump Discharge Isolation Valve	2(B)	10	GA	MO	C	EO PIT	RR RR	ROJ-12 ROJ-12	
1820	SI	ISI-27353 (B5)	Recirculating Pump Min Flow Line Check Valve	2(C)	2	CK	SA	C	EO	2Y	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		
733B	SI	ISI-27353 (C5)	RHR HX #31 Outlet Safety Valve	2(C)	3/4	SF	SA	C	SP	10Y		
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
839C	SI	ISI-27353 (C7)	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
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		
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	EC PIT	CS 2Y	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	EC PIT	CS 2Y	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	EC PIT	CS 2Y	CSJ-22	
856J	SI	ISI-27353 (H8)	High Head Safety Injection to Loop #2 Cold Leg NonBIT Header	2(B)	2	GL	MO	O	EC PIT	CS 2Y	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	ROJ-14 ROJ-14 VR-1	
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	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	ROJ-14 ROJ-14	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	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	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	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	ROJ-14 ROJ-14 VR-1	
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	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	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	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	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	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	ROJ-14 ROJ-14	
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	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	ROJ-14 ROJ-14 VR-1	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	ROJ-14 ROJ-14 VR-1	
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	ROJ-14 ROJ-14 VR-1	
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	ROJ-14 ROJ-14 VR-1	
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	ROJ-14 ROJ-14 VR-1	
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	ROJ-14 ROJ-14 VR-1	
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
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

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	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	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 2Y	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 2Y	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
892A	SI	ISI-27353 (E7)	#31 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y		
892B	SI	ISI-27353 (E6)	#32 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y		
892C	SI	ISI-27353 (E6)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
892D	SI	ISI-27353 (E5)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	C	SP	10Y		
894A	SI	ISI-27353 (D7)	#31 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	PIT	2Y		Passive
894B	SI	ISI-27353 (D7)	#32 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	PIT	2Y		Passive
894C	SI	ISI-27353 (D6)	#33 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	PIT	2Y		Passive
894D	SI	ISI-27353 (D5)	#34 SIS Accumulator Discharge Valve	2(B)	10	GA	MO	O	PIT	2Y		Passive
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 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 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 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 ROJ-17	
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 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 ROJ-18	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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 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 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	EO EC PIT	OP OP 2Y		
HCV-640	SI	ISI-27353 (C5)	RHR HX #32 Outlet Throttle Valve	2(B)	8	BU	MO	O	EO EC PIT	OP OP 2Y		

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 2Y	CSJ-27 CSJ-27	Note 2
202	CVCS	ISI-27363 (G6)	Letdown Containment Isolation	NC(A)	2	GA	AO	O	EC FST-C PIT LT-1	CS CS 2Y 2Y	CSJ-27 CSJ-27	Note 2
203	CVCS	ISI-27363 (G7)	Letdown Safety Relief	NC(C)	2	SF	SA	C	A-SP	10Y		
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 2Y	CSJ-28	Note 2
210A	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	CK	SA	C	EO EC	CS OP	CSJ-30	Note 1
210B	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	CK	SA	O	EO EC	OP OP		Note 1
210C	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	CK	SA	C	EO EC	CS OP	CSJ-30	Note 1
210D	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	CK	SA	O	EO EC	OP OP		Note 1
211	CVCS	ISI-27363 (E7)	Pressurizer Auxiliary Spray Check	1(C)	2	CK	SA	C	EC	OP		
212	CVCS	ISI-27363 (E7)	Pressurizer Auxiliary Spray Isolation	1(C)	2	GL	AO	C	EC FST-C PIT	OP OP 2Y		
213A	CVCS	ISI-27363 (D7)	Excess Letdown Line Isolation	1(B)	1	GL	AO	C	EC FST-C PIT	OP OP 2Y		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
213B	CVCS	ISI-27363 (D7)	Excess Letdown Line Isolation	1(B)	1	GL	AO	C	EC FST-C PIT	OP OP 2Y		
218	CVCS	ISI-27363 (D7)	Seal Return Line Safety Relief	NC(C)	3	SF	SA	C	A-SP	10Y		
222	CVCS	ISI-27363 (D6)	RCP Seal Water Return Isolation	NC(A)	4	GA	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
226	CVCS	ISI-27363 (E6)	Charging Containment Isolation	NC(A)	3	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-28	Note 2
227	CVCS	ISI-27363 (E6)	Charging Line Containment Isolation Valve	NC(A)	3	GL	MA	C	LT-1	2Y		Passive Note 2
250A	CVCS	ISI-27363 (B8)	#31 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
250B	CVCS	ISI-27363 (B8)	#32 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
250C	CVCS	ISI-27363 (B7)	#33 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
250D	CVCS	ISI-27363 (B7)	#34 RCP Seal Injection Containment Isolation	NC(A)	2	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
251A	CVCS	ISI-27363 (B8)	31 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251B	CVCS	ISI-27363 (B8)	32 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251C	CVCS	ISI-27363 (B7)	33 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251D	CVCS	ISI-27363 (B7)	34 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251E	CVCS	ISI-27363 (B8)	31 RCP Seal Water Injection Check	NC(C)	2	CK	SA	C	A-EC	OP		
251F	CVCS	ISI-27363 (B8)	32 RCP Seal Water Injection Check	NC(C)	2	CK	SA	C	A-EC	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
251G	CVCS	ISI-27363 (B7)	33 RCP Seal Water Injection Check	NC(C)	2	CK	SA	C	A-EC	OP		
251H	CVCS	ISI-27363 (B7)	34 RCP Seal Water Injection Check	NC(C)	2	CK	SA	C	A-EC	OP		
251J	CVCS	ISI-27363 (B8)	31 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251K	CVCS	ISI-27363 (B8)	32 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251L	CVCS	ISI-27363 (B7)	33 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
251M	CVCS	ISI-27363 (B7)	34 RCP Seal Water Injection Check	2(C)	2	CK	SA	C	EC	OP		
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		
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		
441	CVCS	ISI-27363 (B8)	#31 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
442	CVCS	ISI-27363 (B8)	#32 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
443	CVCS	ISI-27363 (B7)	#33 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
444	CVCS	ISI-27363 (B7)	#34 RCP Seal Injection Containment Isolation	NC(A)	1	GL	MO	O	EC PIT LT-1	CS 2Y 2Y	CSJ-31	Note 2
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 FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956B	SMPL	ISI-27453 (G6)	Pressurizer Steam Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956C	SMPL	ISI-27453 (F7)	Pressurizer Liquid Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956D	SMPL	ISI-27453 (F6)	Pressurizer Liquid Space Sample Containment Isolation	1(A)	3/8	GL	AO	C	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956E	SMPL	ISI-27453 (F7)	RCS Hot Leg Sample Isolation	1(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956F	SMPL	ISI-27453 (F6)	RCS Hot Leg Sample Isolation	1(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956G	SMPL	ISI-27453 (E6)	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
956H	SMPL	ISI-27453 (E7)	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	O	EC FST-C PIT LT-1	OP OP 2Y 2Y		Note 2
958	SMPL	ISI-27453 (D7)	RHR Loop Sample Containment Isolation	2(A)	3/4	GL	AO	C	EC FST-C PIT LT-3	OP OP 2Y 2Y		

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-3	OP OP 2Y 2Y		
990A	SMPL	ISI-27453 (F7)	Recirculating Pump Discharge Sample Isolation	2(A)	1 1/2	GL	MO	C	PIT LT-3	2Y 2Y		Passive
990B	SMPL	ISI-27453 (F6)	Recirculating Pump Discharge Sample Isolation	2(A)	1 1/2	GL	MO	C	PIT LT-3	2Y 2Y		Passive
990C	SMPL	ISI-27453 (D6)	RHR Loop Sample Main Valve	2(A)	3/8	GL	MA	C	LT-3	2Y		Passive

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1495	IVSW	ISI-27463 (F6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1501	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1502	IVSW	ISI-27463 (H5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1503	IVSW	ISI-27463 (E6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1505	IVSW	ISI-27463 (H3)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1506	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1507	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1508	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1509	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1510	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1511	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1512	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1513	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1514	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1515	IVSW	ISI-27463 (E5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1516	IVSW	ISI-27463 (H5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1517	IVSW	ISI-27463 (H6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1518	IVSW	ISI-27463 (H6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1519	IVSW	ISI-27463 (G8)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1520	IVSW	ISI-27463 (H8)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1521	IVSW	ISI-27463 (H5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1522	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1523	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1524	IVSW	ISI-27463 (H8)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1525	IVSW	ISI-27463 (G8)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1526	IVSW	ISI-27463 (G8)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1529	IVSW	ISI-27463 (F6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1530	IVSW	ISI-27463 (F6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1531	IVSW	ISI-27463 (F5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1534	IVSW	ISI-27463 (E6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1535	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1536	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1537	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1538	IVSW	ISI-27463 (H5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1539	IVSW	ISI-27463 (H5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1540	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1541	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1542	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
1543	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1544	IVSW	ISI-27463 (E7)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1545	IVSW	ISI-27463 (D5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1546	IVSW	ISI-27463 (D5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1547	IVSW	ISI-27463 (D5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1548	IVSW	ISI-27463 (D5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1549	IVSW	ISI-27463 (F5)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1550	IVSW	ISI-27463 (E6)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1551	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1552	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1553	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		
1554	IVSW	ISI-27463 (H4)	IVSW Injection Check	2(C)	3/8	CK	SA	O	EO	OP		

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	ROJ-19	Note 2
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 2Y		Note 2
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 2Y		Note 2
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 2Y		Note 2
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		Note 2
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 2Y		Note 2
652	RCS	ISI-27473 (E4)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37	
653	RCS	ISI-27473 (E4)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37	
654	RCS	ISI-27473 (E5)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37	
655	RCS	ISI-27473 (E5)	RX Vessel Head Vent Valve	1(B)	1	GL	SO	C	EO PIT	CS 2Y	CSJ-37	

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 EC PIT	CS CS 2Y	CSJ-38 CSJ-38	
PCV-456	RCS	ISI-27473 (G1)	PORV	1(B)	3	GL	AO	C	EO EC PIT	CS CS 2Y	CSJ-38 CSJ-38	
PCV-464	RCS	ISI-27473 (G2)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y		
PCV-466	RCS	ISI-27473 (G3)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y		
PCV-468	RCS	ISI-27473 (G3)	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	C	SP	5Y		

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		
14	SI	ISI-27503 (F7)	Spray Add. Tank Vac. Rel.	3(C)	1	SF	SA	C	SP	10Y		
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	
1815	SI	ISI-27503 (F7)	Spray Add. Tank Relief	3(C)	3/4	SF	SA	C	SP	10Y		
1823	SI	ISI-27503 (G7)	Boric Acid Injection Safety Relief Valve	2(C)	3/4	SF	SA	C	SP	10Y		
1835A	SI	ISI-27503 (G7)	BIT Outlet Valve	2(A)	4	GA	MO	O	EO EC PIT	OP OP 2Y		
1835B	SI	ISI-27503 (G7)	BIT Outlet Valve	2(A)	4	GA	MO	O	EO EC PIT	OP OP 2Y		
1838A	SI	ISI-27503 (D4)	Spray Add. to Educt. #31	2(C)	3	CK	SA	C	EO EC-NI	CS RR	CSJ-48 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 ROJ-20	
1852A	SI	ISI-27503 (G5)	BIT Inlet Valve	2(B)	4	GA	MO	O	PIT	2Y		Passive
1852B	SI	ISI-27503 (G5)	BIT Inlet Valve	2(B)	4	GA	MO	O	PIT	2Y		Passive
842	SI	ISI-27503 (E3)	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	O	EC LT-3 PIT	CS 2Y 2Y	CSJ-39	
843	SI	ISI-27503 (E3)	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	O	EC LT-3 PIT	CS 2Y 2Y	CSJ-39	
846	SI	ISI-27503 (G3)	RWST Isolation Valve	2(B)	14	GA	MA	O	EC LT-3	CS 2Y	CSJ-40	
847	SI	ISI-27503 (F3)	SIS Pump Suction	2(C)	8	CK	SA	C	PEO EO EC	OP RR CS	 ROJ-21 CSJ-41	

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
849A	SI	ISI-27503 (F4)	SIS Pump #31 Discharge Isolation Valve	2(C)	4	CK	SA	C	PEO EO EC	OP RR OP	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	ROJ-22	
850A	SI	ISI-27503 (F5)	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	O	EC LT-1 PIT	OP 2Y 2Y		Note 2
850C	SI	ISI-27503 (F5)	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	O	EC LT-1 PIT	OP 2Y 2Y		Note 2
851A	SI	ISI-27503 (F5)	SIS Pump #32 Discharge Isolation Valve	2(A)	4	GA	MO	O	EO EC LT-1 PIT	OP OP 2Y 2Y		Note 2
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	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	ROJ-22	
859A	SI	ISI-27503 (H7)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	2Y		Passive Note 2
859C	SI	ISI-27503 (H7)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	2Y		Passive Note 2
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		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	 ROJ-23 ROJ-23	Note 2
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	 ROJ-23 ROJ-23	Note 2
869A	SI	ISI-27503 (D8)	Containment Spray Pump #31 Discharge Valve	2(A)	8	GA	MA	O	EC LT-1	OP 2Y		Note 2
869B	SI	ISI-27503 (D8)	Containment Spray Pump #32 Discharge Valve	2(A)	8	GA	MA	O	EC LT-1	OP 2Y		Note 2
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		Passive Note 2
878B	SI	ISI-27503 (D6)	Containment Spray Pump Test Isolation Valve	2(A)	3/4	GL	MA	C	LT-1	5Y		Passive Note 2
881	SI	ISI-27503 (B3)	RHR Pump Suction	2(C)	12	CK	SA	C	PEO EO	OP RR	 ROJ-24	
882	SI	ISI-27503 (B3)	RHR Pump Suction	2(B)	12	GA	MO	O	EC PIT	CS 2Y	CSJ-43	
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 EC	OP OP		
884B	SI	ISI-27503 (F4)	SIS Pump to #32 Min-Flow	2(C)	3/4	CK	SA	C	EO EC	OP OP		
884C	SI	ISI-27503 (G4)	SIS Pump to #33 Min-Flow	2(C)	3/4	CK	SA	C	EO EC	OP OP		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
885A	SI	ISI-27503 (B8)	Containment Sump RHR Suction Isolation Valve	2(A)	14	GA	MO	C	EO PIT	CS 2Y	CSJ-45	
885B	SI	ISI-27503 (B7)	Containment Sump RHR Suction Isolation Valve	2(A)	14	GA	MO	C	EO PIT	CS 2Y	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 PIT	CS CS 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 PIT	CS CS 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
1870	RHR	ISI-27513 SH1 (G1)	RHR Pump Mini Flow Isolation	2(A)	2	GL	MO	O	EO EC LT-3 PIT	CS CS 2Y 2Y	CSJ-57 CSJ-57	
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 EC LT-3	OP OP 2Y		
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-3 PIT	CS CS 2Y 2Y	CSJ-50 CSJ-50	
744	RHR	ISI-27513 SH1 (H3)	RHR Pump Discharge to RHR HX Isolation	2(A)	12	GA	MO	O	EO EC LT-3 PIT	CS CS 2Y 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		
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		

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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	 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	 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		
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		

Valve No.	System	Drwg No./Coor.	Descripton	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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 2Y 2Y	CSJ-53	Note 2
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 2Y 2Y	CSJ-54	Note 2
785A	CC	ISI-27513 SH1 (F7)	SGBD HTX Cooling Water Safety	3(C)	3/4	SF	SA	C	SP	10Y		
785B	CC	ISI-27513 SH1 (F5)	Failed Fuel Detector Cooling Water Safety	3(C)	3/4	SF	SA	C	SP	10Y		
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 2Y 2Y	CSJ-54	Note 2
789	CC	ISI-27513 SH1 (G7)	RCP Seal CCW Return Isolation	3(A)	3	GA	MO	O	EC LT-1 PIT	CS 2Y 2Y	CSJ-55	Note 2
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 2Y 2Y		Note 2
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 2Y 2Y		Note 2
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 2Y 2Y		Note 2
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 2Y 2Y	CSJ-53	Note 2

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
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 2Y 2Y		Note 2
807	CC	ISI-27513 SH1 (D2)	Seal Water HTX Safety	3(C)	3/4	SF	SA	C	SP	10Y		
810	CC	ISI-27513 SH1 (D3)	NRHX Inlet Isolation	3(B)	6	GA	MA	O	EC	CS	CSJ-56	
812	CC	ISI-27513 SH1 (E2)	NRHX Cooling Water Safety	3(C)	3/4	SF	SA	C	SP	10Y		
814	CC	ISI-27513 SH1 (E1)	NRHX Outlet Isolation	3(B)	6	GA	MA	O	EC	CS	CSJ-56	
816	CC	ISI-27513 SH1 (B3)	Sample HX Cooling Water Safety	3(C)	1	SF	SA	C	SP	10Y		
821G	CC	ISI-27513 SH1 (C7)	Flash Evaporator Product Cooler Safety	3(C)	1	SF	SA	C	SP	10Y		
822A	CC	ISI-27513 SH1 (H8)	#31 RHR HX CCW Outlet Isolation Valve	3(B)	12	GA	MO	C	EO EC PIT	OP OP 2Y		
822B	CC	ISI-27513 SH1 (H8)	#32 RHR HX CCW Outlet Isolation Valve	3(B)	12	GA	MO	C	EO EC PIT	OP 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 2Y 2Y	CSJ-55	Note 2
109	FPC	ISI-27513 SH2 (E6)	#32 Spent Fuel Pit Pump Discharge Check	3(C)	8	CK	SA	O	A-EO A-EC	OP OP		
53	FPC	ISI-27513 SH2 (F6)	#31 Spent Fuel Pit Pump Discharge Check	3(C)	8	CK	SA	O	A-EO A-EC	OP OP		
802	FPC	ISI-27513 SH2 (G3)	Spent Fuel Pit HTX Relief	3(C)	3/4	SF	SA	C	SP	10Y		

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	CSJ-58 CSJ-58	Note 2
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	CSJ-58 CSJ-58	Note 2
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	CSJ-58 CSJ-58	Note 2
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	CSJ-58 CSJ-58	Note 2
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		Note 2
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		Note 2
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		Note 2

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 R11/R12	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y		Note 2
PCV-1235	SMPL	ISI-70453 (C7)	Containment Isolation Valve To R11/R12	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y		Note 2
PCV-1236	SMPL	ISI-70453 (C8)	Containment Isolation Valve To R11/R12	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y		Note 2
PCV-1237	SMPL	ISI-70453 (C8)	Containment Isolation Valve To R11/R12	NC(A)	1	DA	AO	O	EC FST-C PIT LT-1	OP OP 2Y 5Y		Note 2

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	ROJ-27	Note 2
CB-2	PAEH	N/A	Personnel Airlock Vent to VC Check Valve	NC(A/C)	1	CK	SA	C	EC LT-1	2Y 5Y	ROJ-27	Note 2
CB-3	PAEH	N/A	Personnel Airlock Inner Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive Note 2
CB-4	PAEH	N/A	Personnel Airlock Outer Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive Note 2
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	ROJ-27	Note 2
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	ROJ-27	Note 2
CB-7	PAEH	N/A	Equipment Hatch Airlock Inner Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive Note 2
CB-8	PAEH	N/A	Equipment Hatch Airlock Outer Door Equalizing Ball Valve	NC(A)	3	GL	MA	C	LT-1	5Y		Passive Note 2

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 require quarterly exercising while 210B and 210D will be exercised during cold shutdown.

2. The test frequency for valves tested in accordance with Appendix J will be controlled by the Appendix J program not the IST program. The IST program will be updated periodically to reflect Appendix J.

Appendix C

COLD SHUTDOWN JUSTIFICATIONS

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 this valve during operation would result in a loss of condenser makeup. Also, because of the Condensate Pump Seals, if this valve closes we would have to trip the plant due to losing seal water to the Condensate Pumps.	

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 this valve during operation would result in a loss of condenser makeup. Also, because of the Condensate Pump Seals, if this valve closes we would have to trip the plant due to losing seal water to the Condensate Pumps.

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:	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
(NO LONGER USED)

System:

Drawing:

Components:

Normal Function

Safety Function:

Testing Requirement:

CS Justification:

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 negative reactivity 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 negative reactivity 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,EC	
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 Spray Additive Tank Isolation Valve 876B 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	
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 1838B	Spray Additive to Eductor 31 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 756B	Charging Pump CCW Supply Isolation 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 JUSTIFICATIONS

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 refueling outage both the MS-41 and MS-42 valves will be full stroke exercised open during the 2 year 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 refueling outage during the 2 year 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 refueling outage this valve will be full stroke exercised open, during the 2 year #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 refueling outage PCV-1187 through PCV-1189 will be exercised open during the 2 year 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 refueling outage BFD-31 and BFD-47-1 through BFD-47-4 will be exercised to the fully open position during the 2 year 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 refueling outage these valves will be verified closed during the 2 year 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 refueling outage 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 OM-10 4.2.2.3(e) and (f) will be complied with. Fail safe testing for PCV-1228 will be performed every refueling outage.

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 refueling outage 1616 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of OM-10 4.2.2.3(e) and (f) will be complied with.

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 setup and performance limitations may render leak rate testing impractical during power operations and cold shutdowns and allows testing this valve during refueling outages.

Alternate Testing Every refueling outage 741 will be exercised and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of OM-10 4.2.2.3(e) and (f) will be complied with.

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 refueling outage NNE-1610 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of OM-10 4.2.2.3(e) and (f) will be complied with.

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

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 refueling outage valve closure will be verified during 2 year Technical Specification 4.5.B.2.c leakage testing (also see Relief Request VR-1).

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

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

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 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 refueling outage valve 518 will be exercised, and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of OM-10 4.2.2.3(e) and (f) will be complied with.	

ROJ-20

System:	SI	
Drawing:	ISI-27503	
Components:	1838A 1838B	Spray Add. To Educt. #31 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 and full stroke exercised open during each reactor refueling outage.

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 refueling outage 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 OM-10 4.2.2.3(e) and (f) will be complied with.

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 open quarterly and full stroke exercised open 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 refueling outage these valves will be exercised and closure will be verified by leak testing. The Analysis of Leakage Rates and the Corrective Action requirements of OM-10 4.2.2.3(e) and (f) will be complied with.