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## 1.0 INTRODUCTION

Revision 5 of the Indian Point (Unit 3) (IP3) ASME Inservice Testing Program Plan will  $|\mathbb{R}|$  be in effect through the end of the second 120-month (10-year) inspection interval, unless changed for other reasons. The Plan will be updated prior to the start of the third inspection interval in accordance with the requirements of 10 CFR 50.55a(g).

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

## 2.0 PROGRAM DEVELOPMENT

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

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

- \* <u>Centrifugal and positive displacement pumps</u> 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.
- \* <u>Valves (and their actuating and position indicating systems)</u> 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 |D| licensee actions.

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

## 2.1 Initial Program Scope

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

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

The sequence followed during the development effort was as follows:

- 1) Each of the plant systems was subjected to an overview to determine any potential active safety function as described in the scope statement. Those systems with no obvious safety functions were then excluded from further consideration. Plant documents as well as operating staff inputs were utilized in this phase.
- 2) For the remaining systems, flow diagrams were studied and any component that could possibly have an active or passive safety function (other than simply maintaining the pressure boundary) were identified for further evaluation.
- 3) The function of each component identified in 2), above, was determined based on available documentation, staff input or general experience of the evaluator. Testing requirements were derived based on the component function(s) and the applicable rule(s).
- 4) Available documents were reviewed and specific or implied component operational requirements were compared to the information derived in 3), above.
- 5) The results of Steps 1) through 4) were reviewed by several knowledgeable members of the plant staff and evaluated for accuracy and consistency. Based on this review, the final program scope was derived and the IST Program Plan developed.

## 2.2 Program Update

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

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

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

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

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- \* NRC Generic Letter 89-04, Supplement 1 Guidance On Developing Acceptable Inservice Testing Programs
- \* NUREG-1482 Guidelines for Inservice Testing at Nuclear Power Plants

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

## 3.0 TESTING PROGRAM FOR PUMPS

## 3.1 General

## 3.1.1 Code

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

### 3.1.2 Pump Program Table

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

### 3.1.3 Allowable Ranges of Test Quantities

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

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### 3.1.4 Instrumentation

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

## 3.1.5 Testing Intervals

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

## 3.2 Relief Requests for Pump Testing

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

## RELIEF REQUEST NO. PR-1

### PUMPS:

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

### **TEST REQUIREMENT:**

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

## BASIS FOR RELIEF:

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

### **ALTERNATE TESTING:**

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

## RELIEF REQUEST NO. PR-2

### PUMPS:

Applicable to all pumps in the Program.

### **TEST REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

## **ALTERNATE TESTING:**

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

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

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

<u>Ref. Vib.</u>	Accep. Ran	ge Alert	Action Req.
< 0.15	0 - 0.3	0.301 - 0.45	> 0.45
0.15 - 0.3	0 - 0.45	0.451 - 0.7	> 0.7
0.3 - 0.6	0 - 0.7	None	> 0.7
0.6 - 0.7	0 - 0.7	None	> 0.7

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



# RELIEF REQUEST NO. PR-3

## PUMPS:

Applicable to all pumps in the Program.

### TEST REQUIREMENT:

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

### **BASIS FOR RELIEF:**

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

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

### **ALTERNATE TESTING:**

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

## RELIEF REQUEST NO. PR-4

### PUMPS:

Applicable to all pumps in the Program.

### **TEST REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

- \* Indiscriminately declaring safety system pumps inoperative could result in excessive and unneeded testing of other plant safeguard systems and components. Such testing could ultimately detract from the overall reliability of plant safety systems. In addition, unwarranted testing unnecessarily adds to the burden of the operating staff and dilutes efforts focused on the performance of their primary duties. Such testing also results in unnecessary radiation exposure.
- \* The case where a test parameter exceeds the reference value does not indicate pump degradation. It may merely signify that the reference value is probably on the lower side of the statistical scatter of the test data and the specific test in question is on the upper side. Note that the reference values are subject to the same elements of statistical error associated with any other individual test.
- \* The 3-percent limitation is overly restrictive when compared to the accuracy of the instrumentation used to gather the test data as required by Paragraph IWP-4110 (+/-2 percent).
- \* Power plant operating systems are not configured in a manner that provides the accuracy and precision needed to consistently and reliably provide the repeatability required to meet the requirements implied by the 3 percent restriction.
- \* This requirement provides no apparent additional measure of reliability to the equipment.

### ALTERNATIVE TESTING:

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

- a) The Required-Action Range (HIGH) will be greater than 110 percent of the reference value for test quantities of flowrate and differential pressure, and
- b) The Alert-range (HIGH) will be 105 to 110 percent of the reference value for test quantities of flowrate and differential pressure.

### **RELIEF REQUEST NO. PR-5**

#### PUMPS:

Applicable to all pumps in the Program.

#### **TEST REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

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

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

#### **ALTERNATIVE TESTING:**

None

## **RELIEF REQUEST NO. PR-6**

### PUMPS:

Applicable to all pumps in the Program.

### TEST REQUIREMENT:

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

### **BASIS FOR RELIEF:**

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

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

## **ALTERNATE TESTING:**

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

## **RELIEF REQUEST NO. PR-7**

### PUMPS:

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

### TEST REQUIREMENT:

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

### **BASIS FOR RELIEF:**

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

## **ALTERNATE TESTING:**

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

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

# RELIEF REQUEST NO. PR-8

# [WITHDRAWN]

**RELIEF REQUEST NO. PR-9** 

PUMPS:

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

#### TEST REQUIREMENT:

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

## **BASIS FOR RELIEF:**

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

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

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

### **ALTERNATE TESTING:**

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

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

## RELIEF REQUEST NO. PR-10

## PUMPS:

## Turbine-Driven Auxiliary Feedwater Pump No. AFW-32

### TEST REQUIREMENT:

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

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

#### **BASIS FOR RELIEF:**

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

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

### **ALTERNATE TESTING:**

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

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

## RELIEF REQUEST NO. PR-11

## PUMPS:

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

## **TEST REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

## **ALTERNATE TESTING:**

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

- \* for intervals of 45 days or longer, tests will be performed during each shutdown;
- \* for intervals of less than 45 days, testing will not be performed unless, by the end of the outage, 45 days will have passed since the last test of that particular pump.

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

# RELIEF REQUEST NO. PR-12

[WITHDRAWN]

# **RELIEF REQUEST PR-13**

# [WITHDRAWN]

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# RELIEF REQUEST PR-14

[WITHDRAWN]

## **RELIEF REQUEST NO. PR-15**

## PUMPS:

All pumps in the Program

### TEST REQUIREMENT:

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

### **BASIS FOR RELIEF:**

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

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

### **ALTERNATE TESTING:**

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

# RELIEF REQUEST NO. PR-16

# [WITHDRAWN]

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**RELIEF REQUEST NO. PR-17** 

# [WITHDRAWN]

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#### RELIEF REQUEST NO. PR-18

PUMPS:

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

#### **TEST REQUIREMENT:**

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

#### **BASIC FOR RELIEF:**

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

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

- 1. The manufacturer's pump curves were validated when the pumps were known to operate acceptably. The data used originated from the Modification Acceptance Test after pump installation.
- 2. The instruments used during the Modification Acceptance Test either met or exceeded the Code required accuracy.
- 3. 18 points from the manufacturer's curve were used to construct the pump reference curve, however only 4 of the points cover the tested flow range which is considered acceptable due to the narrow test range. The full pump curve ranges from 0 to 85 GPM while the test curve ranges from 20 to 35 GPM.
- 4. The constructed curve uses a narrow flow range which encompasses the normally expected flow observed from the Modification Test.
- 5. The acceptance criteria established does not conflict with the operability criteria for flow rate and differential pressure in technical specifications or the facility safety analysis report.

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RELIEF REQUEST NO. PR-18 (cont)

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

### **ALTERNATE TESTING:**

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

### 4.0 TESTING PROGRAM FOR VALVES

## 4.1 General

4.1.1 Code

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

4.1.2 Valve Program Table

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

4.1.3 Deferred Testing

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

### 4.1.4 Testing Intervals

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

4.1.5 Cold Shutdown Testing

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

4.1.6 Position Indication Testing

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

#### 4.1.7 Fail-Safe Testing

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

### 4.1.8 Stroke Time Evaluation

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

### 4.1.9 Check Valve Disassembly

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

### 4.2 <u>Relief Requests for Valve Testing</u>

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

**RELIEF REQUEST NO. VR-1** 

SYSTEMS:

All systems

### VALVES:

Various

#### **CATEGORIES**:

A and B

#### FUNCTIONS:

Various

#### **REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

### **ALTERNATE TESTING:**

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

# RELIEF REQUEST NO. VR-2

# [WITHDRAWN]

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RELIEF REQUEST NO. VR-3

### SYSTEM:

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

### VALVE:

CT-29-2

### CATEGORY:

С

### FUNCTION:

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

### **REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

### **ALTERNATE TESTING:**

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

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

# RELIEF REQUEST NO. VR-4

[WITHDRAWN]

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### RELIEF REQUEST NO. VR-5

### <u>SYSTEM:</u>

Boiler Feedwater (Dwg. No. ISI-20193)

### VALVES:

BFD 31 BFD 47-1 thru BFD 47-4

## CATEGORY:

С

### FUNCTION:

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

### **REQUIREMENT:**

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

## BASIS FOR RELIEF:

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

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

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

### ALTERNATE TESTING:

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

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

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

### **RELIEF REQUEST NO. VR-6**

### SYSTEM:

Instrument Air (Dwg. No. ISI-20363)

### VALVES:

IA-39 PCV-1228

## CATEGORIES:

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

### **FUNCTION:**

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

### **REQUIREMENTS:**

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

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

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

### **BASIS FOR RELIEF:**

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

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

### ALTERNATE TESTING:

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

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RELIEF REQUEST NO. VR-7

### <u>SYSTEM:</u>

Waste Disposal (Dwg. No. ISI-27193)

### VALVE:

1616

### CATEGORY:

A/C

### **FUNCTION:**

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

### **REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

### **ALTERNATE TESTING:**

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

### **RELIEF REQUEST NO. VR-8**

### <u>SYSTEM:</u>

Auxiliary Coolant (Dwg. No. ISI-27203)

## VALVE:

741

### CATEGORY:

A/C

#### FUNCTION:

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

### **REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

#### ALTERNATE TESTING:

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

RELIEF REQUEST NO. VR-9

[WITHDRAWN]

RELIEF REQUEST NO. VR-10

#### SYSTEM:

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

#### VALVE:

NNE-1610

#### **CATEGORY:**

A/C

#### FUNCTION:

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

### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

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## **ALTERNATE TESTING:**

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

# RELIEF REQUEST NO. VR-11

## RELIEF REQUEST NO. VR-12

#### <u>SYSTEM:</u>

Safety Injection (Dwg. No. ISI-27353)

#### VALVES:

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

## **CATEGORY:**

A/C

### **FUNCTION:**

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

### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

#### **ALTERNATE TESTING:**

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

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

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

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# RELIEF REQUEST NO. VR-13

## RELIEF REQUEST NO. VR-14

### SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

#### VALVES:

886A and 886B

#### CATEGORY:

С

## FUNCTION:

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

#### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

#### **ALTERNATE TESTING:**

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

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

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

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



#### RELIEF REQUEST NO. VR-15

## SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

#### VALVES:

889A and 889B

### CATEGORY:

В

### FUNCTION:

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

#### **REQUIREMENT:**

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

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

## **BASIS FOR RELIEF:**

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

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

#### **ALTERNATE TESTING:**

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

RELIEF REQUEST NO. VR-16

#### SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

#### VALVES:

895A thru 895D

#### CATEGORY:

A/C

#### **FUNCTION:**

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

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

#### **ALTERNATE TESTING:**

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

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

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#### RELIEF REQUEST NO. VR-17

#### SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

### VALVES:

897A thru 897D

### CATEGORY:

A/C

#### FUNCTION:

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

### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

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

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## **ALTERNATE TESTING:**

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

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

RELIEF REQUEST NO. VR-18

### SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

## VALVES:

1802A and 1802B

### **CATEGORY:**

В

#### FUNCTION:

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

## **REQUIREMENT:**

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

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

## **BASIS FOR RELIEF:**

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

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

### ALTERNATE TESTING:

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

### RELIEF REQUEST NO. VR-19

## <u>SYSTEM:</u>

Safety Injection (Dwg. No. ISI-27353)

### VALVE:

1820

## CATEGORY:

С

## **FUNCTION:**

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

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

## **ALTERNATE TESTING:**

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

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

RELIEF REQUEST NO. VR-20

### SYSTEM:

Reactor Coolant (Dwg. No. ISI-27473)

## VALVE:

518

## CATEGORY:

A/C

## FUNCTION:

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

### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

#### **ALTERNATE TESTING:**

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



### RELIEF REQUEST NO. VR-21

### SYSTEM:

Safety Injection (Dwg. No. ISI-27503)

## VALVE:

847

## CATEGORY:

С

### FUNCTION:

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

#### **REQUIREMENT:**

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

### **BASIS FOR RELIEF:**

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

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

#### ALTERNATE TESTING:

This valve will be partial-stroke exercised quarterly with minimum flow and full-flow exercised in conjunction with safety injection system testing performed during each refueling outage.

## RELIEF REQUEST NO. VR-22

#### SYSTEM:

Safety Injection (Dwg. No. ISI-27503)

#### VALVES:

849A and 849B 852A and 852B

## CATEGORY:

С

#### FUNCTION:

<u>849A and 852A</u> 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.

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

#### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

#### **ALTERNATE TESTING:**

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

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**RELIEF REQUEST NO. VR-23** 

#### <u>SYSTEM:</u>

Safety Injection (Dwg. No. ISI-27503)

#### VALVES:

867A and 867B

#### **CATEGORY**:

A/C

#### **FUNCTION:**

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

#### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

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

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#### **ALTERNATE TESTING:**

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

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

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

### RELIEF REQUEST NO. VR-24

### SYSTEM:

Safety Injection (Drawing No. ISI-27503)

## VALVE:

881

## CATEGORY:

С

### FUNCTION:

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

## **ALTERNATE TESTING:**

This valve will be partial-stroke exercised quarterly.

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

# RELIEF REQUEST NO. VR-25

# RELIEF REQUEST NO. VR-26

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RELIEF REQUEST NO. VR-27

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**RELIEF REQUEST NO. VR-28** 

## RELIEF REQUEST NO. VR-29

## SYSTEM:

Safety Injection (Dwg. No. ISI-27353)

## VALVE:

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

## CATEGORY:

A/C

## FUNCTIONS:

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

## **REQUIREMENTS**:

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

## BASIS FOR RELIEF:

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

## **ALTERNATE TESTING:**

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



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RELIEF REQUEST NO. VR-30

### RELIEF REQUEST NO. VR-31

#### SYSTEM:

Personnel Airlock/Equipment Hatch

VALVES:

CB-1 CB-2

CB-5 CB-6

CATEGORY:

A/C

#### FUNCTION:

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

## **REQUIREMENT:**

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

Category A valves shall be leaktested per IWV-3420.

## **BASIS FOR RELIEF:**

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

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

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

#### **ALTERNATE TESTING:**

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



RELIEF REQUEST NO. VR-32

**RELIEF REQUEST NO. VR-33** 

### SYSTEMS:

Various

#### VALVES:

Various

## **CATEGORIES**

A and A/C

### FUNCTION:

Valves provide containment isolation when in the closed position.

## **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

## ALTERNATE TESTING

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

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

RELIEF REQUEST NO. VR-34

RELIEF REQUEST NO. VR-35

## SYSTEM:

Boiler Feedwater (Dwg. No. ISI-20193)

### VALVES:

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

## CATEGORY

С

### FUNCTION:

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

#### **REQUIREMENT:**

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



## BASIS FOR RELIEF:

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

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

## **ALTERNATE TESTING:**

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

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

#### RELIEF REQUEST NO. VR-36

#### SYSTEM:

Various

#### VALVES:

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

#### <u>CATEGORY</u>

С

## FUNCTION:

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

### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

#### **ALTERNATE TESTING:**

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

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### **RELIEF REQUEST NO. VR-37**

### <u>SYSTEM:</u>

Main Steam (Dwg. No. ISI-20173)

### VALVES:

MS-41 and MS-42

#### CATEGORY

С

#### FUNCTIONS:

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

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

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

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

#### ALTERNATE TESTING:

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

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

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

RELIEF REQUEST NO. VR-38

# RELIEF REQUEST NO. VR-39

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RELIEF REQUEST NO. VR-40

[WITHDRAWN]

D

# RELIEF REQUEST NO. VR-41

# RELIEF REQUEST NO. VR-42

[WITHDRAWN]

D

RELIEF REQUEST NO. VR-43

## SYSTEM:

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

## VALVES:

PCV-1187 thru PCV-1189

## **CATEGORY**

В

## FUNCTIONS:

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

## **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

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

#### ALTERNATE TESTING:

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

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RELIEF REQUEST NO. VR-44

D

## RELIEF REQUEST NO. VR-45

### SYSTEM:

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

## VALVES:

774A thru 774D

## **CATEGORY**

С

### FUNCTION:

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

#### **REQUIREMENT:**

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

## **BASIS FOR RELIEF:**

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

#### **ALTERNATE TESTING:**

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

**RELIEF REQUEST NO. VR-46** 

D

[WITHDRAWN]

RELIEF REQUEST NO. VR-47

#### SYSTEM:

Containment Spray (Dwg. No. ISI-27503)

#### VALVES:

1838A and 1838B

#### **CATEGORY:**

С

## FUNCTION:

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

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

#### **ALTERNATE TESTING:**

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

RELIEF REQUEST NO. VR-48

[WITHDRAWN]

D



**RELIEF REQUEST NO. VR-49** 

#### SYSTEM:

Component Cooling (Dwg. No. ISI-27513)

## VALVES:

751 A&B

## **CATEGORY:**

С

## FUNCTION:

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

#### **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

#### **ALTERNATE TESTING:**

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

#### RELIEF REQUEST NO. VR-50

#### SYSTEM:

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

#### VALVES:

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

#### **CATEGORY:**

#### С

### FUNCTION:

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

## **REQUIREMENT:**

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

#### **BASIS FOR RELIEF:**

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

#### **ALTERNATE TESTING:**

These valves will be exercised closed every two years.

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Appendix A

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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.



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

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

Page A-2 of A-3



Pump	Description	IST Class	Drwg No.	IST Req Speed Meas.	IST Req Inlet Press Meas.	IST Req Diff Press Mens.	Flow	IST Req Vib Meas.		IST Test	IST Relief Request
CCW-31	COMPONENT COOLING PUMP #31	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CCW-32	COMPONENT COOLING PUMP #32'	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CCW-33	COMPONENT COOLING PUMP #33	3	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1
CS-31	CONTAINMENT SPRAY PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	PR-11
CS-32	CONTAINMENT SPRAY PUMP #32	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	<b>PR-1</b> 1
CVCS-31	CHARGING PUMP #31	NC	ISI 27363	Y	Y	Y	Y	Y	N	0	
CVCS-32	CHARGING PUMP #32	NC	ISI 27363	Y	Y	Y	Y			0	<u> </u>
CVCS-33	CHARGING PUMP #33	NC	ISI 27363	Y	Y	Y	Ŷ	-	N	0	
REC-31	RECIRCULATION PUMP #31	2	ISI 27353	NA	Y (PR-7)	Y	N	-	N		<b>PR-9,</b> 11
REC-32	RECIRCULATION PUMP #32	2	ISI 27353	NA	Y (PR-7)	Y	N		N		PR-9,11 PR-9,11
RHR-31	RESIDUAL HEAT REMOVAL PUMP #31	2	ISI 27513-1	NA	Y	Y	Y	Ŷ	N	Q	PR-1*
RHR-32	RESIDUAL HEAT REMOVAL PUMP #32	2	ISI 27513-1	NA	Y	Y	Y	Y	N	Q	PR-1*
SIS-31	SAFETY INJECTION PUMP #31	2	ISI 27503	NA	Y	Y	Y	Y	N	Q/R	<b>PR-1</b> 1
SIS-32	SAFETY INJECTION PUMP #32	2	ISI 27503	NA	Y	Y	Ŷ		N	Q/R Q/R	PR-11 PR-11
SIS-33	SAFETY INJECTION PUMP #33	2	ISI 27503	NA	Y	Y	Ŷ		N		PR-11 PR-11
SWN-31	SERVICE WATER PUMP #31	3	ISI 20333-1	NA	Y (PR-7)	Y	Ŷ		N		PR-11 PR-1
SWN-32	SERVICE WATER PUMP #32	3	ISI 20333-1	NA	Y (PR-7)	Y	Ŷ		N		PR-1 PR-1
SWN-33	SERVICE WATER PUMP #33	3	ISI 20333-1	····	Y (PR-7)	Ŷ	Ŷ	<u> </u>	N		PR-1 PR-1
SWN-34	SERVICE WATER PUMP #34	3	ISI 20333-1		Y (PR-7)	Y			N		PR-1 PR-1
SWN-35	SERVICE WATER PUMP #35	3	ISI 20333-1		Y (PR-7)	Ŷ			N		PR-1 PR-1
SWN-36	SERVICE WATER PUMP #36	3	ISI 20333-1		Y (PR-7)	Y	-		N		PR-1 PR-1

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

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Appendix B

SUMMARY INSERVICE TESTING PROGRAM - VALVES -

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**Reference Drawings** 

Drawing No.	System	Page
ISI-20173	Main Steam	B-4
ISI-20183	Condensate and Boiler Feed Pump Suction	B-7
ISI-20193	Boiler Feedwater	B-9
ISI-20253	Condenser Air Removal and Water Box Priming	B-12
ISI-20333	Service Water	B-13
ISI-20353	Station Air	B-15
ISI-20363	Instrument Air	B-16
ISI-20413	Main Steam Traps	B-17
ISI-26533	Post-Accident Containment Sample	B-18
ISI-27193 SH 1	Waste Disposal	B-20
ISI-27193 SH 2	Waste Disposal	B-20
ISI-27203	Auxiliary Coolant	B-22
ISI-27223	Service Water	B-24
ISI-27233	Nitrogen To Nuclear Equipment	B-27
ISI-27243	Demineralized Water	B-28
ISI-27293 SH 1	Steam Generator Blowdown	B-29
ISI-27293 SH 2	Steam Generator Blowdown	B-29
ISI-27353	Safety Injection, Sheet 1	B-31
ISI-27363	Chemical and Volume Control	B-38
ISI-27453	Sampling	B-41
ISI-27473 ISI-27503 ISI-27513 SH 1 ISI-27513 SH 2 ISI-40223 ISI-70453	Reactor Coolant, Sheet 2 Safety Injection, Sheet 2 Auxiliary Coolant, Sheet 1 Auxiliary Coolant, Sheet 2 Containment Purge Radiation Monitoring Personnel Airlock/ Equip. Hatch	B-43 B-45 B-49 B-52 B-54 B-55 B-56

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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

Type

The valve type as follows:

AOC Air-operated Control AOCK Air-Assisted Check Valve BU Butterfly СК Check DA Diaphram GA Gate GL Globe MSC Manual stop-check SF Safety/relief

The nominal valve size in inches.

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.)

Regm't Test

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-0 Fail-safe test to the open position.
- LT-1 Leakage test in accordance with 10 CFR 50. Appendix J.
- LT-2 Leakage test intersystem LOCA
- PEO Partial-stroke exercise to open position
- PIT Remote position indication verification
- SP Setpoint test of safety/relief valves
- VI Visual inspection of valve internals.

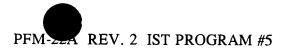
Freq

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 Refers to the test period for testing safety/ relief valves 5 years
- 10Y Refers to the test period for testing safety/ relief valves 10 years

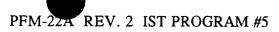
Relief Req Relief Requests are designated VR-XX. Refer to Section 3.2 for relief requests.

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

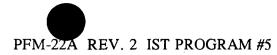


	•	Drwg									Relief	
		No./Coor.		Class/Cat			Actuator	Position	Reqm't	Freq	Req	Notes
MS-1-31	MS	ISI-20173		2(B)	28	AOCK	AO	0	EC	CS		CSJ-1
		(F7)	Isolation						FST-C	CS		
				L					PIT	2Y		
MS-1-32	MS	ISI-20173	#32 Steam Generator Main Steam	2(B)	28	AOCK	AO	0	EC	CS		CSJ-1
		(H7)	Isolation						FST-C	CS		
									PIT	2Y		
MS-1-33	MS			2(B)	28	AOCK	AO	0	EC	CS		CSJ-1
		(E7)	Isolation						FST-C	CS		
									PIT	2Y		
MS-1-34	MS		#34 Steam Generator Main Steam	2(B)	28	AOCK	AO	0	EC	CS		CSJ-1
		(D7)	Isolation						FST-C	CS		
									PIT	2Y		
MS-2-31	MS		#31 Steam Generator Main Steam Non-	2(C)	28	СК	SA	0	A-EC	CS		CSJ-2
		(F7)	Return Check									÷
MS-2-32	MS		#32 Steam Generator Main Steam Non-	2(C)	28	CK	SA	0	A-EC	CS		CSJ-2
		(H7)	Return Check									
MS-2-33	MS		#33 Steam Generator Main Steam Non-	2(C)	28	СК	SA	Ο	A-EC	CS		CSJ-2
		<u>(E7)</u>	Return Check							L		
MS-2-34	MS		#34 Steam Generator Main Steam Non-	2(C)	28	СК	SA	0	A-EC	CS		CSJ-2
	1.62	(D7)	Return Check									
MS-41	MS <sup>+</sup>		#32 Aux. Boiler Feedpump Steam	2(C) ***	4	MSC	SA	С	PEO	OP		
		(F8)	Supply From #32 Main Steam Line						EO	2Y	VR-37	
									EC-HW	OP	VR-37	
	) (0	101 00170				-	~ ~ ~		EC-VI	RR	VR-37	
MS-42	MS		#32 Aux. Boiler Feedpump Steam	2(C)	4	MSC	SA	С	PEO	OP		
		(F7)	Supply From #33 Main Steam Line						EO	2Y	VR-37	
Ĩ							ľ		EC-HW	OP	VR-37	
	<u>.</u>	101 00170		2(0)					<u>EC-VI</u>	RR	<u>VR-37</u>	
MS-45-1	MS		#31 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
10.15.0	) (7		Relief Valve	2(0)		017						
MS-45-2	MS		#32 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
(0.45.0			Relief Valve	2(0)		SF			<u>an</u>			
MS-45-3	MS		#33 Steam Generator Main Steam Safety	2(C)	6	Sr	SA	С	SP	5Y	VR-36	
10.15.1			Relief Valve	2(0)	6	OF			<u>(17)</u>			<u> </u>
MS-45-4	MS		#34 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(D8)	Relief Valve									

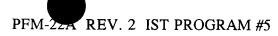
Page B-4 of B-58



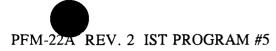
		Drwg									Reheft	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq		Notes
MS-46-1	MS	ISI-20173	#31 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(F8)	Relief Valve							_		
MS-46-2	MS	ISI-20173	#32 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(H8)	Relief Valve									
MS-46-3	MS		#33 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(E8)	Relief Valve									
MS-46-4	MS		#34 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(D8)	Relief Valve									
MS-47-1	MS		#31 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(F7)	Relief Valve									
MS-47-2	MS		#32 Steam Generator Main Steam Safety	2(C)	6.	SF	SA	С	SP	5Y	VR-36	
· · · · · · · · · · · · · · · · · · ·		(H7)	Relief Valve									
MS-47-3	MS		#33 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		<u>(E7)</u>	Relief Valve									
MS-47-4	MS		#34 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
		(D7)	Relief Valve									
MS-48-1	MS		#31 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
			Relief Valve									
MS-48-2	MS		#32 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
			Relief Valve	2(0)	-							
MS-48-3	MS .		#33 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
			Relief Valve	2(0)			<u> </u>					
MS-48-4	MS		#34 Steam Generator Main Steam Safety	2(C)	6	SF	SA	С	SP	5Y	VR-36	
	) (0		Relief Valve	2(0)	6	OF.	<u>.</u>		<b>an</b>			
MS-49-1	MS		Main Steam Safety Relief Valve	2(C)	6	SF	SA	С	SP	5Y	VR-36	
MS 40 2		(F7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA		<u>ap</u>			
MS-49-2	MS		Main Steam Safety Renet Valve	2(C)	0	Sr	SA	C	SP	5Y	VR-36	
MS-49-3	MS	(H7)	Main Steam Safety Relief Valve	2(C)	6	SF	SA	C	SP	<u></u>	TID O(	
113-47-3	1112	(E7)	Walli Steall Safety Keller Valve	2(0)	0	эг	эл	L	51	5Y	VR-36	
MS-49-4	MS		Main Steam Safety Relief Valve	2(C)	6	SF	SA	С	SP	5Y		
1113-43-4	1015	(D7)	Iviani Steani Safety Kener varve	2(0)	0	51	SК	C	Sr	эγ	VR-36	
MS-52	MS		#32 ABFP Steam Pressure Reducing	3(C)	4	SF	SA	С	SP	10Y	VR-36	<u> </u>
1010-02	IVI5		Staion Relief	5(0)	7	51	JA	U	SE	101	VK-36	
		(H0)	Staton Relief									• · · · · · · · · · · · · · · · · · · ·



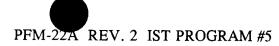
Valve No.			Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1134	MS	ISI-20173	#31 Steam Generator Main Steam	2(B)	6	GL	AO	С	EO	CS		CSJ-3
		(F7)	Atmospheric Relief Valve						EC	CS		
									FST-C	CS		
									PIT	2Y		
PCV-1135	MS	ISI-20173	#32 Steam Generator Main Steam	2(B)	6	GL	AO	С	EO	CS		CSJ-3
		(G7)	Atmospheric Relief Valve						EC	CS		
									FST-C	CS		
						~			PIT	2Y	-	
PCV-1136	MS	ISI-20173	#33 Steam Generator Main Steam	2(B)	6	GL	AO		EO	CS		CSJ-3
		(E7)	Atmospheric Relief Valve						EC	CS		
									FST-C	CS		
DOVINO	1.(0	101 00170	1124 St. Commenter Main Steam	2(1)					PIT	2Y		
PCV-1137	MS	ISI-20173	#34 Steam Generator Main Steam	2(B)	6	GL	AO	С	EO	CS		CSJ-3
		(D7)	Atmospheric Relief Valve						EC	CS		
									FST-C	CS		
DC1/ 1120		ISI-20173	#32 Aux. Feed Pump Steam Control	3(B)	3	AOC	AO		PIT	2 <u>Y</u>		
PCV-1139	MS		#32 Aux. Feed Fump Steam Control	5(5)	3	AUC	AU		EO	OP		
		(H6)							EC	OP		
									FST-O	OP		
									PIT	2Y		
PCV-1310A	MS	ISI-20173	Main Steam Supply to #32 Aux. Feed	2(B)	4	GA	AO	0	EC	OP		
		(G6)	Pump Room Isolation						FST-O	OP		
			•						PIT	2Y		
PCV-1310B	MS	ISI-20173	Main Steam Supply to #32 Aux. Feed	3(B)	4	GA	AO	0	EC	OP		
		(G6)	Pump Room Isolation						FST-O	OP		
		· ·							PIT	2Y		



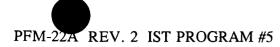
	4	Drwg	_								Relief	
		No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
1158-1	COND	ISI-20183	Condensate Storage Tank Low-Level	3(B)	12	BU	AO	0	EC	CS		CSJ-4
		(D7)	Isolation Valve	ĺ					FST-C	cs		
1150.0	00170				<b> </b>				PIT	2Y		
1158-2	COND	ISI-20183	Condensate Storage Tank Low-Level	NC(B)	12	BU	AO	0	A-EC	CS		CSJ-5
		(D-7)	Isolation Valve						A-FST-C	CS		
CT-107	COND	ISI-20183	CST Return Line Isolation Check	2(0)		OV	<u></u>		A-PIT	2Y		
		(F6)		3(C)	6	СК	SA	Ο	EC	CS		CSJ-6
CT-26	COND	ISI-20183	#31 Aux. Feed Pump Suction From CST	3(C)	6	СК	SA	С	PEO	OP	_	CSJ-7
		(E7)			•				EO	CS		
				L					EC	2Y	VR-50	
CT-28	COND	(F7)	#32 Aux. Feed Pump City Water Supply Check	NC(C)	6	СК	SA	С	A-PEO	2Y		Note 2
CT-29-1	COND	ISI-20183 (F7)	#31 Aux. Feed Pump City Water Supply Check	NC(C)	6	СК	SA	С	A-PEO	2Y		Note 2
CT-29-2	COND		#32 Aux. Feed Pump Suction From CST	3(C)	8	СК	SA	С	PEO	OP		
		(F7)							EO	2Y	VR-3	
									EC	2Y	VR-50	
CT-31	COND	ISI-20183 (E7)	#33 Aux. Feed Pump City Water Supply Check	NC(C)	6	СК	SA	С	A-PEO	2Y		Note 2
CT-32	COND	ISI-20183	#33 Aux. Feed Pump Suction From CST	3(C)	6	СК	SA	Ċ	РЕО	OP		CSJ-7
		(E7)							EO	CS		
									EC	2Y	VR-50	
CT-35-1	COND	ISI-20183 (E8)	#33 AFW Pump Suction Relief	3(C)	3/4	SF	SA	С	SP	10Y	VR-36	
СТ-35-2	COND		#31 AFW Pump Suction Relief	3(C)	3/4	SF	SA	С	SP	10Y	VR-36	
CT-6	COND		CST Supply to Aux. Feed Pumps	3(B)	12	BU	MA	0	PIT	2Y		Passive
		(G7)	Isolation			Í						
CT-64	COND		CST Supply to Aux. Feed Pumps Isolation	3(B)	8	GA	MA	0	PIT	2Y		Passive
CT-85-1	COND	(E7) ISI-20183	#31 Auxiliary Feed Pump Rotor Thrust	<b>3</b> (B)	1 1/2	СК	SA	С	EO	OP		
		(E8)	Balancing Check						-			
CT-85-2	COND		#32 Auxiliary Feed Pump Rotor Thrust	3(B)	1 1/2	СК	SA	С	EO	OP		
		(F8)	Balancing Check						_			



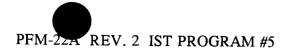
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't		Relief Req	
PCV-1187	COND	ISI-20183	#31 AFWP City Water Makeup Isolation	3(B)	6	GA	AO	С	EO	2Y	VR-43	
		(F7)							FST-C	2Y	VR-43	
			· · · · · · · · · · · · · · · · · · ·						PIT	2Y		
PCV-1188	COND	ISI-20183	#32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



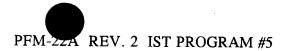
Value No	Stratom	Drwg No./Coor.	Description	0		-					Relief	
				Class/Cat	• ••••••••••••••		Actuator				Req	Notes
BFD-2-31	FW	(G3)	#31 Boiler Feed Pump Discharge MOV	NC	20	GA	MO	0	A-EC	RR		
BFD-2-32	FW	ISI-20193 (F3)	#32 Boiler Feed Pump Discharge MOV	NC	20	GA	MO	0	A-EC	RR		
BFD-31	FW	ISI-20193 (B5)	#32 Aux. Feed Pump Discharge Check	3(C)	6	СК	SA	С	EO PEO	2Y CS	VR-5	CSJ-9
BFD-34	FW	ISI-20193 (B5)	#31 Aux. Feed Pump Discharge Check	3(C)	4	СК	SA	С	EO	CS		CSJ-8
BFD-35	FW		#31 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC	CS 2Y	VR-35	CSJ-10
BFD-37	FW		#31 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC	CS 2Y	VR-35	CSJ-10
BFD-39	FW		#33 Aux. Feed Pump Discharge Check	3(C)	4	СК	SA	С	EO	CS	VIC-33	CSJ-8
BFD-40	FW		#33 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC	CS 2Y	VR-35	CSJ-10
BFD-42	FW		#33 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC	CS 2Y	VR-35	CSJ-10
BFD-47-1	FW		#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С		2Y CS CS	VR-5	CSJ-9 CSJ-11
3FD-47-2	FW	ISI-20193 (B3)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC PEO	2Y CS CS	VR-5	CSJ-9 CSJ-11
BFD-47-3	FW	ISI-20193 (B3)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С	EO EC PEO	2Y CS CS	VR-5	CSJ-9 CSJ-11
3FD-47-4	FW	ISI-20193 (B2)	#32 Aux. Feed Pump Flow Control Valve Discharge Check	3(C)	3	СК	SA	С		2Y CS CS		CSJ-9 CSJ-11
3FD-50	FW	ISI-20193 (B4)	#32 Aux. Feed Pump Min. Flow Check	3(C)	3	СК	SA	С	EO	OP		
BFD-52	FW		#31 Aux. Feed Pump Min. Flow Check	3(C)	2	СК	SA	С	EO	OP		
3FD-54	FW		#33 Aux. Feed Pump Min. Flow Check	3(C)	2	СК	SA	С	EO	OP		

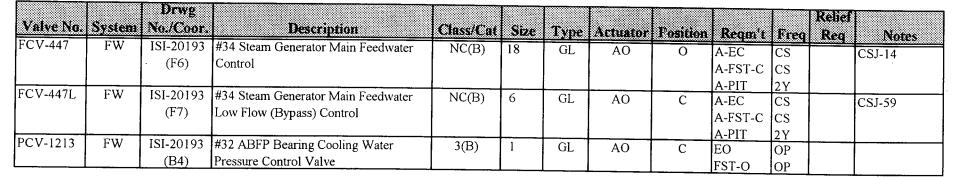


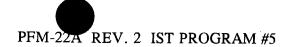
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
BFD-6-1	FW	ISI-20193 (D7)	#31 Steam Generator Feedwater Supply Check	2(C)	18	СК	SA	0	EC	CS		CSJ-12
BFD-6-2	FW	ISI-20193 (E7)	#32 Steam Generator Feedwater Supply Check	2(C)	18	СК	SA	0	EC	CS		CSJ-12
BFD-6-3	FW	ISI-20193 (G7)	#33 Steam Generator Feedwater Supply Check	2(C)	18	СК	SA	0	EC	CS		CSJ-12
BFD-6-4	FW	(F7)	#34 Steam Generator Feedwater Supply Check	2(C)	18	СК	SA	0	EC	CS		CSJ-12
BFD-67	FW	(E8)	Aux. Feed Pump Discharge To #32 Steam Generator Check	2(C)	4	СК	SA	C	EO	CS		CSJ-13
BFD-68	FW	ISI-20193 (D8)	Aux. Feed Pump Discharge To #31 Steam Generator Check	2(C)	4	СК	SA	С	EO	CS		CSJ-13
BFD-69	FW	ISI-20193 (G8)	Aux. Feed Pump Discharge To #33 Steam Generator Check	2(C)	4	СК	SA	С	EO	CS		CSJ-13
BFD-70	FW	(F8)	Aux. Feed Pump Discharge To #34 Steam Generator Check	2(C)	4	СК	SA	С	EO	CS		CSJ-13
CD-122	FW	(B4)	#32 Aux. Feedwater Pump Bearing Cooling Discharge Check	3(C)	2	СК	SA	С	EO	OP		
CD-123	FW	(B4)	#32 Aux. Feedwater Pump Bearing Cooling Relief	3(C)	3	SF	SA	С	SP	10Y	VR-36	
FCV-1121	FW	ISI-20193 (A7)	#31 Aux. Feed Pump Recirculation Control to the CST	3(B)	2	GA	AO	С	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	С	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	С	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	С	EO EC FST-O	OP OP OP		



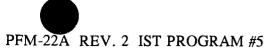
		Drwg No./Coor.		Class/Cat	Size	Туре	Actuator	Position	Reqm't	Frea	Relief Req	Notes
FCV-405D	FW	ISI-20193 (B3)	#32 Aux. Feed Pump To #34 S/G Feed Control	3(B)	2	GL	AO	С	EO EC	OP OP		
FCV-406A	FW	ISI-20193 (B8)	#31 Aux. Feed Pump To #31 S/G Feed Control	3(B)	2	GL	AO	С	F <u>ST-O</u> EO EC FST-O	OP OP OP OP		
FCV-406B	FW	ISI-20193 (B7)	#31 Aux. Feed Pump To #32 S/G Feed Control	3(B)	2	GL	AO	С	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	С	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	С	EO EC FST-O	OP OP OP	· ·	
FCV-417	FW		#31 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	0	A-EC A-FST-C A-PIT	CS CS 2Y		CSJ-14
FCV-417L	FW		#31 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO		A-EC A-FST-C A-PIT	CS CS 2Y		CSJ-59
FCV-427	FW		#32 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	0	A-EC A-FST-C A-PIT	CS CS 2Y		CSJ-14
FCV-427L	FW		#32 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	С	A-EC A-FST-C	CS CS		CSJ-59
FCV-437	FW		#33 Steam Generator Main Feedwater Control	NC(B)	18	GL	AO	0	A-EC A-FST-C	2Y CS CS 2Y		CSJ-14
FCV-437L	FW		#33 Steam Generator Main Feedwater Low Flow (Bypass) Control	NC(B)	6	GL	AO	С	A-EC A-FST-C	CS CS 2Y		CSJ-59







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

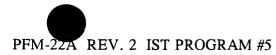


Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Paritian	Danmie	<b></b>	Relief Req	
FCV-1111	RW		SWP'S 34,35,36 to Conventional Non	3(B)	16	BU	MA	0	EC	OP	INC.	Notes
		(F3)	Essential Header Disc.	5(12)		100		0		OF		
FCV-1112	RW	ISI-20333	SWP'S 31,32,33 to Conventional Non	3(B)	16	BU	MA	0	EC	OP		
		(F3)	Essential Header Disc.					Ŭ				
PCV-1205	RW		#31 Service Water Pump Strainer	3(B)	2	GA	AO	С	EO	OP		<u> </u>
		(C3)	Backwash						EC	OP		
									FST-C	OP		
PCV-1206	RW	ISI-20333	#32 Service Water Pump Strainer	3(B)	2	GA	AO	С	EO	OP		
		(C4)	Backwash						EC	OP		
									FST-C	OP		
PCV-1207	RW	ISI-20333	#33 Service Water Pump Strainer	3(B)	2	GA	AO	С	EO	OP		
		(C5)	Backwash						EC	OP		
DOWNER									FST-C	OP		
PCV-1208	RW		#34 Service Water Pump Strainer	3(B)	2	GA	AO	C	EO	OP		
		(C6)	Backwash						EC	OP		
PCV-1209	DIU	101.00000	1025 Q : W/ ( D Q )	2(D)				~	FST-C	OP		
PCV-1209	RW		#35 Service Water Pump Strainer	3(B)	2	GA	AO	С	EO	OP		
		(C7)	Backwash						EC	OP		
PCV-1210	RW	ISI-20333	#36 Service Water Pump Strainer	3(B)	2	GA	AO	С	<u>FST-C</u> EO	OP OP		
1 C V-1210	Λw	(C8)	Backwash	3(B)	2	0A	AU	C	EC			
		(00)	Dackwash						EC FST-C	OP OP		
SWN-1-1	RW	ISI-20333	#31 Service Water Pump Discharge	3(C)	14	СК	SA	0	EO	CS		CSJ-15
~		(C3) <sup>°</sup>	Check	5(0)		ÖN	0/1	0		OP		0.53-15
		(05)								OP		
SWN-1-2	RW	ISI-20333	#32 Service Water Pump Discharge	3(C)	14	СК	SA	0	EO	CS		CSJ-15
		(C4)	Check	, í						OP		000 10
		λ, ´								OP		
SWN-1-3	RW	ISI-20333	#33 Service Water Pump Discharge	3(C)	14	СК	SA	0	EO	CS		CSJ-15
		(C5)	Check						EC	OP		
									PEO	OP		
SWN-1-4	RW		#34 Service Water Pump Discharge	3(C)	14	СК	SA		EO	CS		CSJ-15
		(C6)	Check						EC	OP		
										OP		
SWN-1-5	RW		#35 Service Water Pump Discharge	3(C)	14	СК	SA		EO	CS		CSJ-15
		(C7)	Check							OP		
				L					PEO	OP		

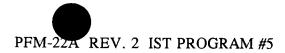
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PFM-22A REV. 2 IST PROGRAM #5

Value No.	C	Drwg No./Coor.	Description	Clause Cas	<u> </u>	<b>_</b>		n			Relief	
				Class/Cat			Actuator			the second s	Req	Notes
SWN-1-6	RW		#36 Service Water Pump Discharge	3(C)	14	CK	SA	0	EO	CS		CSJ-15
		(C8)	Check						EC	OP		
									PEO	OP		
SWN-100-1	RW		#34, 35, & 36 Service Water Pump	3(C)	24	СК	SA	0	EO	CS		CSJ-16
		(G5)	Header to Nuclear Services		ļ							
SWN-100-2	RW		#31, 32, & 33 Service Water Pump	3(C)	24	СК	SA	0	EO	CS		CSJ-16
		(G5)	Header to Nuclear Services									
SWN-100-3	RW -		Backup Service Water Discharge to	3(C)	24	СК	SA	С	EC	OP		
		(G6)	Nuclear Services Header									
SWN-100-4	RW	ISI-20333	Backup Service Water Discharge to	3(C)	24	CK	SA	С	EC	OP		
		(G6)	Nuclear Services Header									
SWN-4	RW	ISI-20333	Service Water to Circ Pump Cooling	3(B)	8	BU	MA	O/C	EC	OP		
		(D5)	Isolation	_								
SWN-5	RW	ISI-20333	Service Water to Circ Pump Cooling	3(B)	8	BU	MA	O/C	EC	OP		
		(D6)	Isolation									
SWN-6	RW	ISI-20333	SWP'S 34,35,36 to Conventional	3(B)	10	BU	MA	O/C	EC	OP		
		(G4)	Essential Header Discharge									
SWN-7	RW	ISI-20333	SWP'S 31,32,33 to Conventional	3(B)	10	BU	MA	O/C	EC	OP		
		(F4)	Essential Header Discharge									
SWN-9-1	RW	ISI-20333	#31 Service Water Pump Vent Check	3(C)	3	CK	SA	C	EC	OP		
		(C2)										
SWN-9-2	RW	ISI-20333	#32 Service Water Pump Vent Check	3(C)	3	CK	SA	С	EC	OP		
		(C2)					-					1
SWN-9-3	RW		#33 Service Water Pump Vent Check	3(C)	3	CK	SA	С	EC	OP		
		(C2)	•									
SWN-9-4	RW	ISI-20333	#34 Service Water Pump Vent Check	3(C)	3	CK	SA	С	EC	OP		
		(C2)	•									
SWN-9-5	RW		#35 Service Water Pump Vent Check	3(C)	3	СК	SA	С	EC	OP		
		(C2)	· · · ·									
SWN-9-6	RW		#36 Service Water Pump Vent Check	3(C)	3	СК	SA	С	EC	OP	•	
2		(C2)						-	-			
		(02)						L	L			

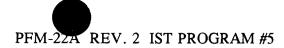


Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't		Relief Req	
SA-24-1	AIR	ISI-20353 (F7)	Containment Isolation	NC(A)	2	DA	MA	С	LT-1			Passive
SA-24-2	AIR	ISI-20353 (F6)	Containment Isolation	NC(A)	2	DA	MA	С	LT-1	2 Y	VR-33	Passive

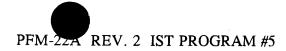


Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Reg	Notes
IA-39	AIR		Inboard Containment Isolation	NC(A/C)	2	CK	SA		EC		VR-6	
		(F6)							LT-1	2Y		
PCV-1228	AIR		Outboard Containment Isolation	NC(A)	2	DA	AO	0	EC	2Y	VR-6	
		(F6)							FST-C	2Y	VR-6	
									PIT	2Y		
Ĺ									LT-1	2Y		

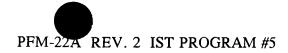
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		Drwg									Relicf	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
MS-34-10	MS	ISI-20413	#33 Steam Generator MST-14 Inlet	2(B)	1	GA	MA	0	EC	OP		
		(E4)	Isolation									
MS-34-4	MS	ISI-20413	#32 Steam Generator MST-10 Inlet	2(B)	1	GA	MA	0	EC	OP		
		(G5)	Isolation									
MS-34-5	MS	ISI-20413	#32 Steam Generator MST-12 Inlet	2(B)	1	GA	MA	0	EC	OP		
-		(G4)	Isolation									
MS-34-7	MS	ISI-20413	#31 Steam Generator MST-6 Inlet	2(B)	1	GA	MA	0	EC	OP		
		(G3)	Isolation									
MS-34-9	MS	ISI-20413	#34 Steam Generator MST-18 Inlet	2(B)	1	GA	MA	0	EC	OP		
		(E6)	Isolation									
MS-37-1	MS	ISI-20413	#31 Steam Generator MST-5 Inlet	2(B)	1 1/4	GA	MA	0	EC	OP		
		(G2)	Isolation									
MS-37-2	MS	ISI-20413	#33 Steam Generator MST-13 Inlet	2(B)	1 1/4	GA	MA	0	EC	OP		<u> </u>
		(E5)	Isolation									
MS-67-1	MS	ISI-20413	#31 Steam Generator MST-1 Inlet	2(B)	1 1/2	GA	MA	0	EC	OP		
		(E2)	Isolation									
MS-67-2	MS	ISI-20413	#32 Steam Generator MST-2 Inlet	2(B)	1 1/2	GA	MA	0	EC	OP		
		(G2)	Isolation									
MS-67-3	MS	ISI-20413	#33 Steam Generator MST-3 Inlet	2(B)	1 1/2	GA	MA	0	EC	OP		
		(E3)	Isolation									
MS-67-4	MS	ISI-20413	#34 Steam Generator MST-4 Inlet	2(B)	1 1/2	GA	MA	0	EC	OP		
		(E5)	Isolation									

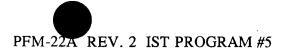


		Drwg									Relief	
	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq		Notes
PS-10	SMPL	ISI-26533	Containment Vent Sample Isolation	NC(A)	2	DA	MA	С	LT-1	2Y		Passive
		(G7)										
PS-7	SMPL	ISI-26533	Containment Vent Sample Isolation	NC(A)	3	DA	MA	С	LT-1	2Y	VR-33	Passive
PS-8		(G7)							ļ			
122-8	SMPL	ISI-26533 (G7)	Containment Vent Sample Isolation	NC(A)	3	DA	MA	С	LT-1	2Y	VR-33	Passive
PS-9	SMPL	ISI-26533	Containment Vent Sample Isolation	NC(A)	3	DA	MA	С	LT-1	2Y	VR-33	Passive
		(F7)									11000	
SOV-506	SMPL	ISI-26533	#33 Fan Cooler Unit Sample to H2	NC(A)	1	GL	SO	С	EC	OP	VR-1	· · · · · · · · · · · · · · · · · · ·
		(E6)	Analyzer B Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
									PIT	2Y		
SOV-507	SMPL	ISI-26533	#34 Fan Cooler Unit Sample to H2	NC(A)	1	GL	SO		EC	OP	VR-1	
		(E5)	Analyzer B Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
									PIŢ	2Y		
SOV-508	SMPL	ISI-26533	#31 Fan Cooler Unit Sample to H2	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(D5)	Analyzer B Isolation						FST-C	OP		
		, ,							LT-1	2Y	VR-33	
									PIT	2Y		
SOV-509	SMPL		#31,#33,#34 Fan Cooler Units Sample to	NC(A)	1	GL	SO		EC	OP	VR-1	
		(E4)	H2 Analyzer B Isolation	-					FST-C	OP		
									LT-I	2Y	VR-33	
									PIT	2Y		
SOV-510	SMPL	ISI-26533	H2 Analyzer A Return to Containment	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(C4)	Isolation						FST-C	OP		
		` ´							LT-1	2Y	VR-33	
									PIT	2Y		



17-1- N.	e .	Drwg	<b>b</b> · · ·	<b>A</b> (A).				-			Relief	
		No./Coor.		Class/Cat	Size		Actuator					Notes
SOV-511	SMPL	ISI-26533	H2 Analyzer A Return to Containment	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(B5)	Isolation						FST-C	OP		
									LT-I	2Y	VR-33	
			X						PIT	2Y		
SOV-512	SMPL		#32 Fan Cooler Unit Sample to H2	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(D5)	Analyzer A Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
									PIT	2 Y		
SOV-513	SMPL	ISI-26533	#35 Fan Cooler Unit Sample to H2	NC(A)	1	GL	SO		50			
307-313	SIVIEL		Analyzer A Isolation	NC(A)	1	GL	50	С	EC	OP	VR-1	
		(0)							FST-C LT-1	OP		
									PIT	2Y 2Y	VR-33	
									FII	2 1		
SOV-514	SMPL	ISI-26533	#32,#35 Fan Cooler Units Sample to H2	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(D4)	Analyzer A Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
									PIT	2Y		
SOV-515	SMPL	ISI-26533	H2 Analyzer B Sample Return to	NC(A)	1	GL	SO	С	<u>F0</u>			
307-313	SIVIEL		Containment Isolation	NC(A)	1	GĽ,	50		EC FST-C	OP	VR-1	
		(D4)	Containancia Isolation						LT-1	OP	VD 22	
										2Y 2Y	VR-33	
									<b>F I I</b>	21		
SOV-516	SMPL	ISI-26533	H2 Analyzer B Sample Return to	NC(A)	1	GL	SO	С	EC	OP	VR-1	
		(B5)	Containment Isolation						FST-C	OP	-	
										2Y	VR-33	
									PIT	2Y		

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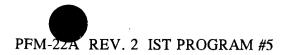


Value Ne	S	Drwg	Desired	C1 40 1							Relief	
1610		No./Coor.		Class/Cat	Size		Actuator					Notes
1610	WD	ISI-27193	N2 Supply to RCDT #31 Isolation	NC(A)	1	DA	AO	0	EC	OP	VR-1	
		SH1 (F3)							FST-C	OP		
									PIT	2Y		
1616	WD	ISI-27193	N2 Supply to RCDT #31 Isolation Check	NC(A/C)	1	СК		· · ·	LT-1	2Y		
1010		SH1 (F3)	N2 Supply to RCD1 #31 Isolation Check	INC(A/C)	1	CK	SA	0	EC	2Y	VR-7	
1702	WD		RCDT #31 Inboard Drain	NC(A)	3	GA	AO	0	LT-1 EC	2Y OP		
1702		SH1 (D3)	RCD1 #31 mooard Dram	NC(A)	3	GA	AU	0				
									FST-C	OP		
									PIT	2Y		
1705	WD	151-27103	RCDT #31 Outboard Drain	NC(A)	3	GA	AO	0	LT-1 EC	2Y OP	VR-33	
1705	WD	SH1 (D3)			5	UA	AU		FST-C	OP OP		
		311 (D3)							PIT	0P 2Y		
									LT-1		VR-33	
1723	WD	ISI-27193	Containment Sump Discharge Outboard	NC(A)	2	DA	AO	0	EC	OP	<u>VR-33</u>	
		SH2 (C4)	Isolation Valve		-	2.11	110	Ŭ	FST-C	OP		
-									PIT	2Y		
									LT-1	2 Y	VR-33	
1728	WD	ISI-27193	Containment Sump Discharge Inboard	NC(A)	2	DA	AO	0	EC	OP	<u>vic-55</u>	
		SH2 (C4)	Isolation Valve						FST-C	OP		
									PIT	2Y		
									LT-1		VR-33	
1786	WD	ISI-27193	RCDT #31 Discharge to Waste Gas	NC(A)	1	DA	AO	0	EC	OP		
		SH1 (F3)							FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
1787	WD	ISI-27193	RCDT #31 Discharge to Waste Gas	NC(A)	1	DA	AO	0	EC	OP		
		SH1 (F3)							FST-C	OP		
									PIT	2Y		
										2Y	VR-33	
1788	WD		RCDT #31 Gas Sample Inboard	NC(A)	3/4	DA	AO		EC	OP		
		SH1 (E3)							FST-C	OP		
										2Y		
									LT-1	2Y	VR-33	1

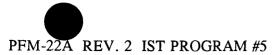


# PFM-22A REV. 2 IST PROGRAM #5

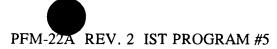
Valve No.		Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't		Relief Req	***************************************
1789	WD	ISI-27193	Reactor Coolant Drain Tank to Gas	NC(A)	3/4	DA	AO	0	EC	OP		
		SH1 (E3)	Analyzer Isolation Valve						FST-C	OP		
								:	PIT	2Y		
			L						LT-1	2Y	VR-33	



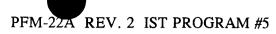
	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Frea	Relief Req	Notes
1836	RHR	ISI-27203 (B3)	RHR Supply Safety Relief	2(C)	2	SF	SA	C	SP	10Y	VR-36	
730	RHR	ISI-27203 (C3)	RHR Supply from RCS	l(A)	14	GA	МО	С	EO A-EC LT-2 PIT	CS CS 2Y 2Y		CSJ-17
731	RHR	ISI-27203 (C3)	RHR Supply from RCS	1(A)	14	GA	МО	С	EO A-EC LT-2 PIT	CS CS 2Y 2Y		CSJ-17
741	RHR	ISI-27203 (B6)	RHR Pump Discharge to Heat Exchanger	2(A/C)	12	СК	SA	С	PEO EO EC LT-1	OP CS 2Y 2Y	VR-8	CSJ-18
745A	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	МО	0	EC PIT	OP 2 Y		
745B	RHR	ISI-27203 (C7)	RHR Pump Discharge to HX Inlet #32 Isolation Valve	2(B)	8	GA	MO	0	EC PIT	OP 2Y		· · · · · · · · · · · · · · · · · · ·
774A	CC	ISI-27203 (F7)	#31 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	СК	SA	0	EC	RR	VR-45	
774B	CC	ISI-27203 (F6)	#32 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	0	EC	RR	VR-45	· · · · · · · · · · · · · · · ·
774C	CC		#33 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	CK	SA	0	EC	RR	VR-45	
774D	CC		#34 RCP Seal Cooler CCW Inlet Check	3(C)	1 1/2	СК	SA	0	EC	RR	VR-45	- <u></u>
782	CC		RCP/Sup. Block Ret. Relief Valve	3(C)	3	SF	SA	С	SP	10Y	VR-36	
783A	CC	ISI-27203	#31 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	С	SP	10Y	VR-36	
783B	СС	ISI-27203	#32 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	C	SP	10Y	VR-36	
783C	СС	ISI-27203	#33 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	С	SP	10Y	VR-36	
783D	CC	ISI-27203	#34 RCP Seal Cooler CCW Return Relief	3(C)	3/4	SF	SA	С	SP	10Y	VR-36	



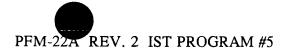
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Reg	Notes
792	СС	ISI-27203 (C4)	Excess Letdown HX Shell Relief	3(C)	3	SF	SA				VR-36	
819A	CC	ISI-27203 (D6)	RHR HX #31 Shell-side Relief Valve	3(C)	1 1/2	SF	SA	С	SP	10Y	VR-36	<b>T</b>
819B	CC	ISI-27203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



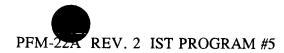
Value No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Tuna	Antreation	Denition	<b>D</b>		Relief	<b></b>	
FCV-1176	RW	ISI-27223	Emergency Diesel Generators SWS	3(B)	6	BU	Actuator AO		EO		Req	Notes	
		(B2)	Outlet Flow Control	) (D)	0	BU	AU	C	EO FST-O	OP OP			
									PIT	0P 2Y			
FCV-1176A	RW	ISI-27223	Emergency Diesel Generators SWS	3(B)	6	BU	AO	С	EO	OP			{
		(B2)	Outlet Flow Control	- ()	Ŭ		10	C	FST-O	OP			
									PIT	2Y			110
SWN-108-3	RW	ISI-27223	Service Water Supply to CCR A/C Cross	3(B)	3	GA	MA	0	EC	OP			D
		(C3)	Connect							Ŭ.			
SWN-108-6	RW	ISI-27223	Service Water Supply to CCR A/C Cross	3(B)	3	GA	MA	0	EC	OP 1			
		(C3)	Connect								1		AII
SWN-110-1	RW	ISI-27223	#31, 32, & 33 Service Water Pump	3(C)	3/4	SF	SA	С	SP	10Y	VR-36		1
		(C3)	Supply to CCR A/C Relief										
SWN-110-2	RW	ISI-27223	#34, 35, & 36 Service Water Pump	3(C)	3/4	SF	SA	С	SP	10Y	VR-36		
		(C3)	Supply to CCR A/C Relief										
SWN-137	RW	ISI-27223	#34, 35 & 36 Service Water Pump	3(B)	4	GA	MA	0/C	EC	OP			1
		(C6)	Supply to SGBD HX Cooling Water										ĺ
SWN-138	RW	ISI-27223	#31, 32 & 33 Service Water Pump	3(B)	4	GA	MA	O/C	EC	OP		· · · · · · · · · · · · · · · · · · ·	1
		(C5)	Supply to SGBD HX Cooling Water										
SWN-29	RW		#31, 32, & 33 Service Water Pump	3(B)	10	BU	MA	O/C	EO	OP			]
		(B4)	Supply to Emergency Diesel Coolers										
		iii	Isolation										
SWN-30	RW		#34, 35, & 36 Service Water Pump	3(B)	10	BU	MA	O/C	EO	OP			
		(B4)	Supply to Emergency Diesel Coolers										
			Isolation					·····					ļ
SWN-31	RW		#31, 32, & 33 Service Water Pump	3(B)	20	BU	MA	O/C	EO	OP			
		(D4)	Supply to CCW HX Header Isolation										
SWN-32	RW		#34, 35, & 36 Service Water Pump	3(B)	20	BU	MA	O/C	EO	OP			
		(D3)	Supply to CCW HX Header Isolation	2(0)	10	- DI			20				
SWN-33-1	RW	ISI-27223	CCW HX's Service Water Supply	3(B)	18	BU	MA	0	EC	OP			
CUDI 22 A	DIV	(D3)	Crosstie Isolation	2(D)	18	DU			Ed	0.0			
SWN-33-2	RW	ISI-27223	CCW HX's Service Water Supply	3(B)	18	BU	MA	0	EC	OP			
ONDI AL L	DIV	(D3)	Crosstie Isolation	2(4)	10	BU	MA		50	0.0			
SWN-41-1	RW		#31 FCU Supply Isolation	3(A)	10	Ud	IVLA	0		OP			
SWAL 41 2	DIV	(E5)	#22 ECU Sumply logistion	3(A)	10	BU	MA	0		2Y OP	VR-33		
SWN-41-2	RW		#32 FCU Supply Isolation	3(A)		ЪU	IVIA	U					
		(E5)		· · ·	I				LT-1	2Y	VR-33		



		Drwg									Relief	
Valve No.	System	No./Coor.		Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
SWN-41-3	RW		#33 FCU Supply Isolation	3(A)	10	BU	MA	0	EC	OP		
		(E6)							LT-1	2Y	VR-33	
SWN-41-4	RW	ISI-27223	#34 FCU Supply Isolation	3(A)	10	BU	MA	0	EC	OP		
		(E6)							LT-1	2Y	VR-33	
SWN-41-5	RW	ISI-27223	#35 FCU Supply Isolation	3(A)	10	BU	MA	0	EC	OP		
	ļ	(E4)			ļ				LT-1	2Y	VR-33	
SWN-42-1	RW		#31 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	С	SP	10Y	VR-36	
		(E5)							LT-1	2Y	VR-33	
SWN-42-2	RW	ISI-27223	#32 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	С	SP	10Y	VR-36	
		(E5)				~~~			LT-1	2Y	VR-33	
SWN-42-3	RW		#33 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	С	SP	10Y	VR-36	
		(E6)			1.1/2		~ .		LT-1	2Y	VR-33	
SWN-42-4 SWN-42-5	RW		#34 FCU Service Water Relief	3(A/C)	1 1/2	SF	SA	С	SP	10Y	VR-36	
	DIV	(E6)		2(4(0))	1.1/0	<u>OF</u>	<u> </u>		LT-1	2Y	VR-33	
	RW		#35 FCU Service Water Relief	3(A/C) <sup>-</sup>	1 1/2	SF	SA	С	SP	10Y	VR-36	
SWN-43-1	DIV	(E4)		2(4)	1				LT-1	2Y -	VR-33	
	RW		#31 FCU Service Water Drain Isolation	3(A)	1	GA	MA	C	LT-1	2Y	VR-33	Passive
SWN-43-2	RW	(E5) ISI-27223	#32 FCU Service Water Drain Isolation	3(A)	1	GA	MA	С	LT-1	2.12	1/10 00	D
	ĸw	(E4)	#32 FCO Service water Drain Isolation	$J(\mathbf{A})$	1	0A	IVLA	U	LI-I	2Y	VR-33	Passive
SWN-43-3	RW		#33 FCU Service Water Drain Isolation	3(A)	1	GA	MA	С	LT-1	2Y	170 22	Descione
	Γ VV	(E6)	#33 FCO Service Water Drain Isolation	J(X)	1	UA	IVLA	C	L1-1	21	VK-33	Passive
SWN-43-4	RW		#34 FCU Service Water Drain Isolation	3(A)	1	GA	MA	С	LT-1	2 Y	VD 22	Passive
		(E6)			1	0A	IVITA	C	L1-1	21	VK-33	rassive
SWN-43-5	RW		#35 FCU Service Water Drain Isolation	3(A)	1	GA	MA	С	LT-1	2Y	VR-33	Passive
		(E4)		-()		U.I.		Ũ		21	VIC-55	
SWN-44-1	RW		#31 FCU Outlet Isolation	3(A)	10	BU	MA	0	EC	OP	<u> </u>	
		(F5)							LT-1	2Y	VR-33	
SWN-44-2	RW		#32 FCU Outlet Isolation	3(A)	10	BU	MA		EC	OP		
		(F4)							LT-1	2Y	VR-33	
SWN-44-3	RW		#33 FCU Outlet Isolation	3(A)	10	BU	MA		EC	OP	1105	
		(F6)		. ,					LT-1	2Y	VR-33	
SWN-44-4	RW		#34 FCU Outlet Isolation	3(A)	10	BU	MA		EC	OP		
		(F6)							LT-1	2Y	VR-33	
SWN-44-5	RW	ISI-27223	#35 FCU Outlet Isolation	3(A)	10	BU	MA		EC	OP		
		(F4)							<u>LT-1</u>	2Y	VR-33	



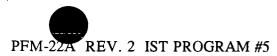
		Drwg									Relief	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Req	Notes
SWN-51-1	RW		#31 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	0	EC	OP		
	L	(F4)							LT-1	2Y	VR-33	
SWN-51-2	RW	ISI-27223	#32 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	0	EC	OP		
		(F4)							LT-1	2Y	VR-33	
SWN-51-3	RW		#33 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	0	EC	OP		
		(F4)							LT-1	2Y	VR-33	
SWN-51-4	RW		#34 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	0	EC	OP		
		(F4)							LT-1	2Y	VR-33	
SWN-51-5	RW	ISI-27223	#35 FCU Rad Mon Supply Isolation	3(A)	1	GA	MA	0	EC	OP		
		(F4)							LT-1	2Y	VR-33	
SWN-62-1	RW	ISI-27223	#31, 32, & 33 Service Water Pump	3(B)	4	BU	MA	0	EO	OP		
		(C3)	Supply to Emergency Diesel #31 Cooler Isolation						EC	OP		
SWN-62-2	RW	ISI-27223	#34, 35, & 36 Service Water Pump	3(B)	4	BU	MA	0	EO	OP		
		(C3)	Supply to Emergency Diesel #31 Cooler						EC	OP		
			Isolation							·		
SWN-71-1	RW	ISI-27223	#31 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	0	EC	OP		
		(F5)							LT-1	2Y	VR-33	
SWN-71-2	RW	ISI-27223	#32 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	0	EC	OP		
		(F5)							LT-1	2Y	VR-33	
SWN-71-3	RW		#33 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	0	EC	OP		
		(F5)							LT-1	2Y	VR-33	
SWN-71-4	RW		#34 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	0	EC	OP		
		(F5)							LT-1	2Y	VR-33	
SWN-71-5	RW		#35 FCU Motor Cooler Outlet Isolation	3(A)	2	GL	MA	0	EC	OP		
		(F5)							LT-1	2Y	VR-33	
SWN-94-1	RW	ISI-27223	#31, 32, & 33 Service Water Pump to	3(B)	3	GA	MA	0	EO	OP		
CHINE OF C		(C4)	CCR A/C Isolation #34, 35, & 36 Service Water Pump to	2(D)	3				EC	OP		
SWN-94-2	RW		, , ,	3(B)	3	GA	MA		EO EO	OP		
TO11 1104	DIV	(C4)	CCR A/C Isolation Containment Temperature Control Valve	3(B)	18	BU	AO		EC	OP		
TCV-1104	RW	ISI-27223	Containment Temperature Control Valve	3(B)	18	во	AU	1	EO Fot o	OP		
		(G3)						1	FST-O	OP	1	
TOU-1105	DUV	101 07000	Containment Temperature Control Valve	3(B)	10	BU	AO	С	PIT EO	<u>2Y</u> OP	┟───┤	
TCV-1105	RW	ISI-27223	Containment remperature condor varve	JUDJ	10	ы	AU	U				
		(G3)							FST-O	OP		
									PIT	2Y		



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't		Relief Req	Notes
16	N2	ISI-27233 (E7)	PCV-455C Accumulator Check	NC(C)	3/4	СК	SA	С	A-EC	RR		Note 2
17	N2	ISI-27233 (E7)	PCV-456 Accumulator Check	NC(C)	3/4	СК	SA	С	A-EC	RR		Note 2
863	N2	ISI-27233 (D6)	Containment N2 Supply Outboard	NC(A)	1	GA	AO		EC FST-C PIT LT-1	OP OP 2Y 2Y	VR-1	
NNE-1607	N2		Containment N2 Supply for Test Equipment Isolation Valve	NC(A)	3/4	GL	MA	С	LT-1	2Y		Passive
NNE-1610	·N2		Containment N2 Supply Isolation Valve	NC(A/C)	1	CK	SA		EC LT-1	2Y 2Y	VR-10	

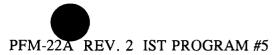
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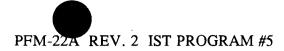




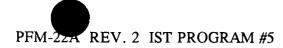
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom't		Relief Ren	
DW-AOV-1	DW		Demin Water To Containment Isolation	NC(A)	2	GA	AO	С	LT-1		VR-33	
DW-AOV-2	DW	<u>(F5)</u> ISI-27243	Demin Water To Containment Isolation	NC(A)			40		PIT	2Y		
D W-AO V-2	Dw	(F5)	Denni water to containment isolation	NC(A)	Z	GA	AO	C	LT-1 PIT	2 Y 2 Y	VR-33	Passive



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom'i	Freo	Relief Ren	Notes
PCV-1214	SG	ISI-27293	#31 SG Blowdown Upstream	2(A)	3	GL	AO	0	EC	OP		
		SH1 (E6)	Containment Isolation						FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1214A	SG		#31 SG Blowdown Downstream	2(A)	3	GL	AO	0	EC	OP		
		SH1 (E5)	Containment Isolation						FST-C	OP		
								•	PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1215	SG		#32 SG Blowdown Upstream	2(A)	3	GL	AO	0	EC	OP		
		SH1 (E6)	Containment Isolation						FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1215A	SG		#32 SG Blowdown Downstream	2(A)	3	GL	AO	0	EC	OP		
		SH1 (E5)	Containment Isolation						FST-C	OP		
									PIT	2Y		
DOLLIDIC		101.07000		2(4)	3	GL	10		LT-1	2Y	VR-33	
PCV-1216	SG		#33 SG Blowdown Upstream	2(A)	3	GL	AO	0	EC	OP		
		SH1 (F6)	Containment Isolation						FST-C	OP		
				· · ·					PIT	2Y		
PCV-1216A	SG	ISI-27293	#33 SG Blowdown Downstream	2(A)	3	GL	AO	0	<u>LT-1</u> EC	2Y OP	VR-33	
FC V-1210A	50		Containment Isolation	2(A)	J	UL	AU	0	FST-C	OP		
		SFI (F3)	Containinent isolation						PIT	2Y		
		н. 1							LT-1	2 T 2Y	VR-33	
PCV-1217	SG	ISI-27293	#34 SG Blowdown Upstream	2(A)	3	GL	AO	0	EC	OP	VK-33	
			Containment Isolation	2(1)	÷	01		Ũ	FST-C	OP		
		5111 (00)							PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1217A	SG	ISI-27293	#34 SG Blowdown Downstream	2(A)	3	GL	AO	0	EC	OP	11-55	
			Containment Isolation						FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1223	SG	ISI-27293	#31 SG Blowdown Sample Upstream	2(A)	1/2	GL	AO	0	EC	OP		
			Containment Isolation						FST-C	OP		
		, í							PIT	2Y		
									LT-1	2Y	VR-33	

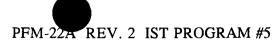


		Drwg									Rehei	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
PCV-1223A	SG	ISI-27293	#31 SG Blowdown Sample Downstream	2(A)	1/2	GL	AO	0	EC	OP		
		SH2 (G7)	Containment Isolation						FST-C	OP		· · ·
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1224	SG	ISI-27293	#32 SG Blowdown Sample Upstream	2(A)	1/2	GL	AO	0	EC	OP		
		SH2 (E7)	Containment Isolation						FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1224A	SG	ISI-27293	#32 SG Blowdown Sample Downstream	2(A)	1/2	GL	AO	0	EC	OP		
		SH2 (E7)	Containment Isolation						FST-C	OP		
									PIT	2Y		
										2Y	VR-33	
PCV-1225	SG	ISI-27293	#33 SG Blowdown Sample Upstream	2(A)	1/2	GL	AO		EC	OP		
		SH2 (F7)	Containment Isolation						FST-C	OP		
									PIT	2Y		
										2Y	VR-33	
PCV-1225A	SG		#33 SG Blowdown Sample Downstream	2(A)	1/2	GL	AO		EC	OP		
		SH2 (F7)	Containment Isolation						FST-C	OP		
										2Y		
				2(1)	1/2		10			2Y	VR-33	
PCV-1226	SG		#34 SG Blowdown Sample Upstream	2(A)	1/2	GL	AO		ÈC	OP		
		SH2 (D7)	Containment Isolation Valve						FST-C	OP		
										2Y		
DOV 10051		101.07000	124 SC Disudarum Sample Darrestraam	2(4)	1/2	GL	AO		LT-1 EC	2Y OP	VR-33	
PCV-1226A	SG		#34 SG Blowdown Sample Downstream	2(A)	1/2	UL	AU		EC FST-C	I		
		SH2 (D7)	Containment Isolation Valve							OP		
										2Y		•
									<u>LT-1</u>	2Y	VR-33	

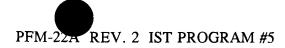


		Drwg									Relief	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq		Notes
1802A	SI	ISI-27353	Recirculating Pump Discharge Isolation	2(B)	10	GA	MO	C	EO	RR	VR-18	
		(B5)	Valve						EC	RR	VR-18	
							·		PIT	RR	VR-18	
1802B	SI	ISI-27353	Recirculating Pump Discharge Isolation	2(B)	10	GA	MO	C	EO	RR	VR-18	
		(B4)	Valve						EC	RR	VR-18	
				ļ					PIT	RR	VR-18	
1820	SI		Recirculating Pump Min Flow Line	2(C)	2	СК	SA	С	EO	2Y	VR-19	
10.004	~.	(B5)	Check Valve									
1869A	SI	ISI-27353	RHR HX #32 to SIS Pump Isolation	2(B)	6	GA	MO	0	EC	OP		
10(00)	01	(C4)	Valve						PIT	2Y		
1869B	SI	ISI-27353	RHR HX #31 to SIS Pump Isolation	· 2(B)	6	GA	MO	0	EC	OP		
7004		(C4)	Valve	2(0)		0.5			PIT	2Y		
733A	SI		RHR HX #32 Outlet Safety Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
733B		(C5)	DID IV #21 Outlet Sefet: Value	2(0)	2/4							
/338	SI	ISI-27353	RHR HX #31 Outlet Safety Valve	2(C)	3/4	SF	SA	С	SP	10Y	VR-36	
746	SI	(C5) ISI-27353	#31 RHR HX Outlet Injection Stop	2(B)	8	GA			E.C.			· · ·
/40	51		Valve	2(B)	0	GA	MO	0	EC	OP		
747	SI	(C5) ISI-27353	#32 RHR HX Outlet Injection Stop	2(B)	8	GA	MO	0	PIT EC	2Y OP		
/4/	51	(C5)	Valve		0	UA	IVIO	0				
838A	SI	181.27353	RHR Return Low Head Injection Loop	1(A/C)	6	СК	SA	С	PIT EO	2Y CS		CGL 10
0504	51		#1	I(AC)	0	CK	SA	C	EC	CS CS		CSJ-19
		(C)	<i>π</i> 1						LT-2	CS 2Y		CSJ-20
838B	SI	ISI-27353	RHR Return Low Head Injection Loop	l(A/C)	6	СК	SA	С	EO	CS		CSJ-19
0501	01		#2	-((2))	Ũ	011	511		EC	CS CS		CSJ-19 CSJ-20
		(150)							LC LT-2	2Y		0.53-20
838C	SI	ISI-27353	RHR Return Low Head Injection Loop	l(A/C)	6	СК	SA	С	EO	CS		CSJ-19
			#3						EC	cs		CSJ-20
		<b>、</b> /							LT-2	2Y	ar a	000 20
838D	SI	ISI-27353	RHR Return Low Head Injection Loop	1(A/C)	6	CK	SA	С	EO	CS		CSJ-19
		(B6)	#4						EC	CS		CSJ-20
		、 <i>、</i>							LT-2	2Y		
839A	SI	ISI-27353 (C7)	SIS Discharge Valve Test Valve	l(B)	3/4	GL	AO	С		2Y		Passive
339B	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	С	PIT	2Y		Passive
-		(C8)	÷	, , , ,								1 400110

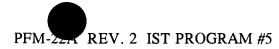
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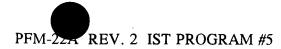
		Drwg		1							Relief	
Valve No	. System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
839C	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	С	PIT	2Y		Passive
		(C7)										
839D	SI	1	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
		(B8)										
839E	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	С	PIT	2Y		Passive
		(C6)										
839F	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
		(B8)										
839G	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
		(C6)										
839H	SI	ISI-27353	SIS Discharge Valve Test Valve	1(B)	3/4	GL	AO	C	PIT	2Y		Passive
		(A8)										
855	SI	ISI-27353	SIS Header Safety Relief Valve	2(C)	3/4	SF	SA	С	SP	10Y	VR-36	
		(H4)										
856B	SI	ISI-27353	High Head Safety Injection to Loop #3	2(B)	2	GL	MO	С	EO	CS		CSJ-21
		(G8)	Hot Leg NonBIT Header						EC	CS		
									PIT	2Y		
856C	SI	ISI-27353	High Head Boron Injection to Loop #4	2(B)	2	GL	MO	0	EO	CS		CSJ-22
		(F8)	Cold Leg BIT Header Stop						EC	CS		
									PIT	2Y		
856E	SI	ISI-27353	High Head Boron Injection to Loop #1	2(B)	2	GL	MO	0	EO	CS		CSJ-22
		(F8)	Cold Leg BIT Header Stop Valve						EC	CS		
									PIT	2Y		
856G	SI.	ISI-27353	High Head Boron Injection to Loop #1	2(B)	2	GL	MO	С	EO	CS		CSJ-21
		(E8)	Hot Leg BIT Header Stop Valve						EC	CS		
									PIT	2 Y		
856H	SI	ISI-27353	High Head Safety Injection to Loop #3	2(B)	2	GL	MO	0	EO	CS		CSJ-22
		(G8)	Cold Leg NonBIT Header						EC	CS		
									PIT	2Y		
856J	SI	ISI-27353	High Head Safety Injection to Loop #2	2(B)	2	GL	MO	0	EO	CS		CSJ-22
		(H8)	Cold Leg NonBIT Header						EC	CS		
			_						PIT	2Y		
857A	SI	ISI-27353	High Head Safety Injection to Loop #1	1(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(G8)	Cold Leg NonBIT Header						EC	2Y	VR-12	
			-			1			LT-2	2Y	VR-29	



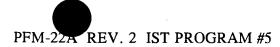
	System	Drwg No./Coor.		Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
857B	SI	ISI-27353	High Head Safety Injection to Loop #3	1(A/C)	2	CK	SA	С	EO	RR	VR-12	
		(G8)	Hot Leg NonBIT Header						EC	2Y	VR-12	
		L							LT-2	2Y		
857C	SI	ISI-27353	Boron Injection to Loop #4 Cold Leg	1(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(F8)							EC	2Y	VR-12	
0.000	·								LT-2	2Y		
857D	SI	ISI-27353	Boron Injection to Loop #2 Cold Leg	1(A/C)	2	CK	SA	C	EO	RR	VR-12	
		(F8)							EC	2 Y	VR-12	
0.575		101 050 10							LT-2	2Y		
857E	SI	ISI-27353	Boron Injection to Loop #1 Cold Leg	1(A/C)	2	CK	SA	С	EO	RR	VR-12	
		(F8)							EC	2Y	VR-12	
857F	CI.	101 272 52		1(4(0))		GV	<u> </u>	~	LT-2	2Y		
857F	SI	ISI-27353	Boron Injection to Loop #3 Cold Leg	1(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(F8)							EC	2Y	VR-12	
857G	SI	161 07252	High Head Safety Injection to Loop #1	1(A/C)	2	СК	64		LT-2	2Y		
85/G	51	ISI-27353		I(A/C)	2	UK	SA	С	EO	RR	VR-12	
		(G8)	Cold Leg						EC	2Y	VR-12	
857H	SI	ISI-27353	High Head Safety Injection to Loop #3	1(A/C)	2	СК	SA	C	LT-2	2Y	VR-29	
03/11	51		Hot Leg	I(A/C)	2	CK	SA	C	EO	RR	VR-12	
		(G8)	Hot Leg						EC	2Y	VR-12	
857J	SI	ISI-27353	Boron Injection to Loop #4 Cold Leg	1(A/C)	2	СК	SA	C	<u>LT-2</u> EO	2Y RR	VR-12	
0.575	51	(F8)	Boron injection to Loop #4 Cold Leg	1(AC)	2	CK	JA	C				
		(18)							LT-2	2Y 2Y	VR-12	
857K	SI	ISI-27353	Boron Injection to Loop #2 Cold Leg	1(A/C)	2	СК	SA	С	EO	2 Y RR	VR-12	
05/10	51	(F8)	Boron injection to hoop #2 cold hop	1(100)	2	on	011	C		2Y	VR-12 VR-12	
		(10)								2 I 2Y	VK-12	
857L	SI	ISI-27353	Boron Injection to Loop #1 Cold Leg	1(A/C)	2	СК	SA	С	EO	Z I RR	VR-12	
	51	(F8)	Deren injection to heep wit deta heB	-(-2-)	_		5.1	U		2Y	VR-12 VR-12	
		(10)								2 Y	VIC-12	
857M	SI	ISI-27353	Boron Injection to Loop #3 Cold Leg	1(A/C)	2	СК	SA	С	EO	RR	VR-12	
	~-	(F8)		ÌÌÍÍ						2Y	VR-12 VR-12	
		(* 0)								2 Y	712-12	· · · · · ·
857N	SI	ISI-27353	Boron Injection to Loop #1 Hot Leg	1(A/C)	2	СК	SA	С		RR	VR-12	· · · · · · · · · · · · · · · · · · ·
		(E8)								2Y	VR-12	
		< /								2Y		



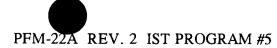
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
857P	SI	ISI-27353	Boron Injection to Loop #1 Hot Leg	1(A/C)	2	CK	SA	С	EO	RR	VR-12	
		(E8)							EC	2Y	VR-12	
				L					LT-2	2Y		
857Q	SI		High Head Safety Injection to Loop #3	1(A/C)	2	CK	SA	С	EO	RR	VR-12	
		(G8)	Cold Leg						EC	2Y	VR-12	
				<b>_</b>					LT-2	2Y	VR-29	
857R	SI	ISI-27353	High Head Safety Injection to Loop #3	1(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(G8)	Cold Leg						EC	2Y	VR-12	-
·									LT-2	2Y	VR-29	
857S	SI	ISI-27353	High Head Safety Injection to Loop #2	l(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(H8)	Cold Leg						EC	2Y	VR-12	
									LT-2	2Y	VR-29	
857T	SI	ISI-27353	High Head Safety Injection to Loop #2	l(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(H8)	Cold Leg				L		EC	2Y	VR-12	
									LT-2	2Y	VR-29	
857U	SI	ISI-27353	High Head Safety Injection to Loop #4	l(A/C)	2	СК	SA	С	EO	RR	VR-12	
		(H8)	Cold Leg						EC	2Y	VR-12	
									LT-2	2Y	VR-29	
857W	SI	ISI-27353	High Head Safety Injection to Loop #4	1(A/C)	2	CK	SA	С	EO	RR	VR-12	
		(H8)	Cold Leg	а - -					EC	2Y	VR-12	
							~ ~ ~		LT-2	2Y	VR-29	
858A	SI		SIS High Head Injection Test Line	2(C)	3/4	CK	SA	C	EO	OP		
0.000	~~	(G4)	Check	2(0)	2/4	OV			EC	OP		
858B	SI	ISI-27353	SIS High Head Injection Test Line	2(C)	3/4	CK	SA	С	EO	OP		
		(G4)	Check	2(7)	-				EC	OP		
880A	SI	ISI-27353	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
2005	<u>ar</u>	(G5)		2(D)	2	<u> </u>			DIT	0.17		
880B	SI	ISI-27353	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
0000	~	(G5)		2(D)	2			0	DIT			
880C	SI	ISI-27353	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
000D		(G5)	Classed Filter Deusing Isolation	2(D)	2	GA	MO	<u> </u>		0.17		
880D	SI		Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
		(G5)	Cl. I Filter Dauging Indiation	2(D)	2	GA	МО	C		0.12		
880E	- SI		Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
0001		(G6)	Obere al Eilter Douging Indiction	2(D)	2	GA	MO	C	DIT	2.		D
880F	SI	ISI-27353	Charcoal Filter Dousing Isolation	2(B)	2	ŪΑ	MO	С	PIT	2Y		Passive
		(G5)				L				L.		



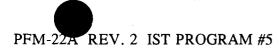
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Ream't	Freq	Relief Req	Notes
880G	SI	ISI-27353 (G6)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
880H	SI	ISI-27353 (G6)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2 Y		Passive
880J	SI	ISI-27353 (G4)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
380K	SI	ISI-27353 (G4)	Charcoal Filter Dousing Isolation	2(B)	2	GA	MO	С	PIT	2Y		Passive
886A	SI	ISI-27353 (B5)	Recirculating Pump #31 Discharge Check Valve	2(C)	8	СК	SA	C	PEO EC EO-VI	2Y 2Y RR	VR-14 VR-14 VR-14	
886B	SI	ISI-27353 (B4)	Recirculating Pump #32 Discharge Check Valve	2(C)	8	СК	SA	С	PEO EC EO-VI	2Y 2Y RR	VR-14 VR-14 VR-14 VR-14	
889A	SI	ISI-27353 (D4)	#32 RHR HX Outlet to Spray Header Stop Valve	2(B)	8	GA	МО	С	EO EC PIT	RR RR RR	VR-14 VR-15 VR-15 VR-15	
389B	SI	ISI-27353 (D4)	#31 RHR HX Outlet to Spray Header Stop Valve	2(B)	8	GA	МО	С	EO EC PIT	RR RR RR	VR-15 VR-15 VR-15	
390A	SI	ISI-27353 (D7)	#31 SIS Accumulator Fill	2(B)	1	GL	AO	С	PIT	2Y	110 13	Passive
90B	SI		#32 SIS Accumulator Fill	2(B)	1	GL	AO	С	PIT	2Y		Passive
90C	SI		#33 SIS Accumulator Fill	2(B)	1	GL	AO	С	PIT	2Y		Passive
90D	SI	ISI-27353 (D5)	#34 SIS Accumulator Fill	2(B)	1	GL	AO	С	PIT	2Y	·	Passive
91A	SI	(E7)	#31 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	С	PIT	2Y		Passive
91B	SI	ISI-27353 (E6)	#32 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	С	PIT	2Y		Passive
91C	SI		#33 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	С	PIT	2Y		Passive
91D	SI		#34 SIS Accumulator Nitrogen Supply/Vent	2(B)	1	GL	AO	С	PIT	2Y		Passive



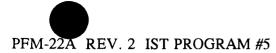
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom'i	Frea	Relief Req	Notes
892A	SI	ISI-27353 (E7)	#31 SIS Accumulator Safety Relief	2(C)	1	SF	SA	С	SP	10Y	VR-36	
892B	SI	ISI-27353 (E6)	#32 SIS Accumulator Safety Relief	2(C)	1	SF	SA	С	SP	10Y	VR-36	
892C	SI	ISI-27353 (E6)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	С	SP	10Y	VR-36	-
892D	SI	ISI-27353 (E5)	#33 SIS Accumulator Safety Relief	2(C)	1	SF	SA	С	SP	10Y	VR-36	
894A	SI	ISI-27353 (D7)	#31 SIS Accumulator Discharge Valve	2(B)	10	GA	МО	0	EC PIT	CS 2Y		CSJ-23
894B	SI	ISI-27353 (D7)	#32 SIS Accumulator Discharge Valve	2(B)	10	GA	МО	0	EC PIT	CS 2Y		CSJ-23
894C	SI	(D6)	#33 SIS Accumulator Discharge Valve	2(B)	10	GA	МО	0	EC PIT	CS 2Y		CSJ-23
894D	SI	(D5)	#34 SIS Accumulator Discharge Valve	2(B)	10	GA	МО	0	EC PIT	CS 2Y		CSJ-23
895A	SI	ISI-27353 (C7)	#31 SIS Accumulator Discharge Valve	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y RR		CSJ-24 CSJ-25
895B	SI	ISI-27353 . (C7)	#32 SIS Accumulator Discharge Valve	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y RR	<u>VR-16</u> VR-16	CSJ-24 CSJ-25
895C	SI	ISI-27353 (C6)	#33 SIS Accumulator Discharge Valve	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y RR	VR-16	CSJ-24 CSJ-25
395D	SI	ISI-27353 (C5)	#34 SIS Accumulator Discharge Valve	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y RR	VR-16	CSJ-24 CSJ-25
896A	SI	ISI-27353 (D8)	#31 SIS Accumulator Drain Valve	2(B)	1	GL	AO	С	PIT	2Y	VIX-10	Passive
896B	SI		#32 SIS Accumulator Drain Valve	2(B)	1	GL	AO	С	PIT	2Y		Passive



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
896C	SI	ISI-27353 (D6)	#33 SIS Accumulator Drain Valve	2(B)	1	GL	AO	С	PIT	2Y		Passive
896D	SI	ISI-27353 (D5)	#34 SIS Accumulator Drain Valve	2(B)	1	GL	AO	С	PIT	2Y	<u> </u>	Passive
897A	SI	ISI-27353 (C8)	High Head/ Low Head to Loop #1 Cold Leg	I(A/C)	10	СК	SA		PEO EC LT-2 EO	CS CS 2Y RR	VR-17	CSJ-26
897B	SI	ISI-27353 (B8)	High Head/ Low Head to Loop #2 Cold Leg	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y	VR-17	CSJ-26
897C	SI	ISI-27353 (B8)	High Head/ Low Head to Loop #3 Cold Leg	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y	VR-17	CSJ-26
397D .	SI	ISI-27353 (A8)	High Head/ Low Head to Loop #4 Cold Leg	1(A/C)	10	СК	SA	С	PEO EC LT-2 EO	CS CS 2Y	VR-17	CSJ-26
399A	SI		#32 RHR HX Outlet to Loop #3 & #4 Cold Leg	2(B)	8	GA	MO		EC PIT	OP 2 Y		
999B	SI	ISI-27353 (C5)	#31 RHR HX Outlet to Loop #1 & #2 Cold Leg	2(B)	8	GA	MO	0	EC PIT	OP 2 Y		
ICV-638	SI	ISI-27353 (C4)	RHR HX #31 Outlet Throttle Valve	2(B)	8	BU	МО			2Y	- ·· · · · · · · · · · ·	Passive
ICV-640	SI		RHR HX #32 Outlet Throttle Valve	2(B)	8	BU	MO	0	PIT	2Y		Passive



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
201	CVCS	ISI-27363 (G6)	Letdown Containment Isolation	NC(A)	2	GA	AO	0	EC FST-C	CS CS		CSJ-27
									PIT LT-1	2 Y 2 Y	VR-33	
202	CVCS	ISI-27363 (G6)	Letdown Containment Isolation	NC(A)	2	GA	AO	0	EC FST-C PIT LT-1	CS CS 2Y 2Y	VR-33	CSJ-27
203	CVCS	ISI-27363 (G7)	Letdown Safety Relief	NC(C)	2	SF	SA	С	SP	10Y	VR-36	
204A	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Isolation	NC(B)	3	GL	AO	С	A-EO A-FST-O A-PIT	CS CS 2Y		CSJ-29
204B	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Isolation	NC(B)	3	GL	AO	0	A-EO A-FST-O A-PIT	CS CS 2Y		CSJ-29
205	CVCS	ISI-27363 (E6)	Charging Containment Isolation	NC(A)	3	GA	МО	0	EC PIT LT-1	CS 2Y 2Y	VR-33	CSJ-28
210A	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	СК	SA	C	ĘO	CS		Note 1 CSJ-30
210B	CVCS	ISI-27363 (E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	СК	SA	0	EO	OP		Note 1
210C	CVCS	ISI-27363 (E7)	Charging Line Loop 2 Hot Leg Check	1(C)	3	CK	SA	С	EO	CS		Note 1 CSJ-30
210D	CVCS	(E7)	Charging Line Loop 1 Cold Leg Check	1(C)	3	СК	SA	0	EO	OP		Note 1
213A	CVCS	(D7)	Excess Letdown Line Isolation	1(B)	1.	GL	AO	Ċ	PIT	2Y		Passive
213B	CVCS	(D7)	Excess Letdown Line Isolation	1(B)	1	GL	AO	С	PIT	2Y		Passive
218	CVCS	(D7)	Seal Return Line Safety Relief	NC(C)	3	SF	SA	С	SP	10Y	VR-36	
222	CVCS	ISI-27363 (D6)	RCP Seal Water Return Isolation	NC(A)	4	GA	МО	0	EC PIT LT-1	CS 2Y 2Y	VR-33	CSJ-31

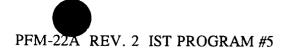


Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom't	Free	Relief Req	Notes
226	CVCS		Charging Containment Isolation	NC(A)	3	GL	MO	0	EC	CS	:	CSJ-28
		(E6)	<u>-</u>					Ŭ	PIT	2Y		0.55-28
		()							LT-1	2Y	VR-33	
227	CVCS	ISI-27363	Charging Line Containment Isolation	NC(A)	3	GL	MA	C	LT-1	2Y		Passive
		(E6)	Valve					_			1	1 455170
250A	CVCS	ISI-27363	#31 RCP Seal Injection Containment	NC(A)	2	GL	MO	0	EC	CS		CSJ-31
		(B8)	Isolation						PIT	2Y	[	
									LT-1	2Y	VR-33	
250B	CVCS	ISI-27363	#32 RCP Seal Injection Containment	NC(A)	2	GL	MO	0	EC	CS		CSJ-31
		(B8)	Isolation						PIT	2Y		
									LT-1	2Y	VR-33	
250C	CVCS	ISI-27363	#33 RCP Seal Injection Containment	NC(A)	2	GL	MO	0	EC	CS		CSJ-31
		(B7)	Isolation						PIT	2Y		
									LT-1	2Y	VR-33	
250D	CVCS	ISI-27363	#34 RCP Seal Injection Containment	NC(A)	2	GL	MO	0	EC	CS		CSJ-31
		(B7)	Isolation						PIT	2Y		
									LT-1	2Y	VR-33	
290	CVCS	ISI-27363	Charging Pump Suction from RWST	2(C)	4	CK	SA	С	EO	CS		CSJ-32
		(C5)	Check									
332	CVCS	ISI-27363	Charging Pump Suction from Emergency	NC(C)	2	СК	SA	С	A-EO	2Y		Note 2
		(B4)	Boration Check									
333	CVCS	ISI-27363	Charging Pump Suction from Emergency	NC(B)	2	GL	MO	С	A-EO	CS		CSJ-33
		<u>(B4)</u>	Boration Isolation						A-PIT	2Y		
362A	CVCS		#31 Boric Acid Transfer Pump	NC(C)	2	СК	SA	0	A-EO	OP		
		(C3)	Discharge Check									
362B	CVCS		#32 Boric Acid Transfer Pump	NC(C)	2	СК	SA	0	A-EO	OP		
		(C3)	Discharge Check									
374	CVCS	ISI-27363	Charging Line Check	NC(C)	3	СК	SA	0	A-EO	OP		
<u> </u>		(E7)										
401	CVCS		#31 Charging Pump Discharge to	NC(C)	1 1/2	CK	SA	0	A-EO	OP		
		(C6)	Charging Header Check							L	L	
403	CVCS		#32 Charging Pump Discharge to	NC(C)	1 1/2	СК	SA	0	A-EO	OP		
		(C6)	Charging Header Check							ļ		
405	CVCS		#33 Charging Pump Discharge to	NC(C)	1 1/2	СК	SA	0	A-EO	OP _		
		(B6)	Charging Header Check							L		

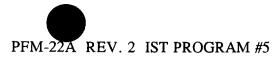
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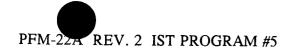
		Drwg No./Coor.		Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
441	CVCS	ISI-27363	#31 RCP Seal Injection Containment	NC(A)	1	GL	MO	. 0	EC	CS		CSJ-31
		(B8)	Isolation						PIT	2Y		
	avea	101.050.00			<b>_</b>				<u>LT-1</u>		VR-33	
442	CVCS	ISI-27363	#32 RCP Seal Injection Containment	NC(A)	1	GL	MO	0	EC	CS		CSJ-31
		(B8)	Isolation						PIT	2Y		
442	CLOB	101.070(0							LT-1	2Y	VR-33	
443	CVCS		#33 RCP Seal Injection Containment	NC(A)		GL	MO	0	EC	CS		CSJ-31
		(B7)	Isolation						PIT	2Y		
444	<u>avos</u>	101.072(2		NICKA					LT-1	2Y	VR-33	
444	CVCS		#34 RCP Seal Injection Containment	NC(A)	1	GL	MO		EC	CS		CSJ-31
		(B7)	Isolation						PIT	2Y		
1101/ 122	OLICO	101.07262				~ ~ ~			LT-1	2Y	VR-33	
HCV-133	CVCS	ISI-27363 (G7)	RHR / CVCS Cross Connect	2(B)	2	GL	AO	С	PIT	2 Y		Passive
LCV-112B	CVCS	ISI-27363	Charging Pump Suction from RWST	2(B)	4	GA	MO	0	EO	CS		CSJ-34
		(C5)	Isolation						PIT	2Y		
LCV-112C	CVCS	ISI-27363	Charging Pump Suction from VCT	NC(B)	4	GA	MO	0	A-EC	CS		CSJ-35
		(D5)	Isolation						A-PIT	2Y		
LCV-459	CVCS	ISI-27363	Letdown Line Isolation	NC(B)	3	GL	AO	0	EC	CS	_	CSJ-36
		(F7)							FST-C	cs		
									PIT	2Y		
LCV-460	CVCS	ISI-27363	Letdown Line Isolation	NC(B)	3	GL	AO	0	EC	CS		CSJ-36
		(F7)							FST-C	cs		
									PIT	2Y		



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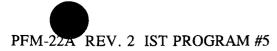
		Drwg									Rehall	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq		Notes
956A	SMPL	ISI-27453	Pressurizer Steam Space Sample	l(A)	3/8	GL	AO	С	EC	OP		
	1	(G7)	Containment Isolation						FST-C	OP		
									PIT	2Y		
			· · · · · · · · · · · · · · · · · · ·						LT-1	2Y	VR-33	
956B	SMPL		Pressurizer Steam Space Sample	l(A)	3/8	GL	AO	С	EC	OP		
		(G6)	Containment Isolation						FST-C	OP		
N									PIT	2Y		
									LT-1	2Y	VR-33	
956C	SMPL	ISI-27453	Pressurizer Liquid Space Sample	l(A)	3/8	GL	AO	С	EC	OP		-
		(F7)	Containment Isolation						FST-C	OP		
									PIT	2Y		
	C) (D)	101.05450		1(4)	2/0			~	LT-1	2Y	VR-33	
956D	SMPL	ISI-27453	Pressurizer Liquid Space Sample	1(A)	3/8	GL	AO	C	EC	OP		
		(F6)	Containment Isolation						FST-C	OP		
									PIT	2Y		
956E	CMDI	ISI-27453	DCS List Log Semple Isolation	l(A)	3/8	GL	AO	0	LT-1	2Y	VR-33	
930E	SMPL	(F7)	RCS Hot Leg Sample Isolation	I(A)	5/8	GL	AU	0	EC	OP		
		(F7)							FST-C	OP		
		-							PIT	2Y		
956F	SMPL	ISI-27453	RCS Hot Leg Sample Isolation	1(A)	3/8	GL	AO	0	LT-1 EC	2Y OP	VR-33	
9 <b>5</b> 01	SIVILL	(F6)	Res not Leg Sample Isolation	1(A)	5/8	UL	AU		EC FST-C	OP		
		(10)							PIT	2Y		
									LT-1	2 I 2Y	VR-33	
956G	SMPL	ISI-27453	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	0	EC	OP	VR-33	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		(E6)		-()	5,6	0.5			FST-C	OP		,
		(10)							PIT	2Y		
									LT-1	2Y	VR-33	
956H	SMPL	ISI-27453	Accumulator's Sample Isolation	2(A)	3/8	GL	AO	0	EC	OP	<u>VIC-35</u>	
		(E7)							FST-C	OP		
		<u> </u>							PIT	2Y		
									LT-I	2Y	VR-33	
958	SMPL	ISI-27453	RHR Loop Sample Containment	2(A)	3/4	GL	AO	С	EC	OP		
		(D7)	Isolation						FST-C	OP		
-			,						PIT	2Y		
									LT-1	2Y	VR-33	



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Valve No.				Class/Cat	Size	Туре	Actuator	Position	Reqm't	Frea	Relief Rea	Notes
959	SMPL	ISI-27453	RHR Loop Sample Containment	2(A)	3/8	GL	AO	С	EC	OP		
		(D6)	Isolation						FST-C	OP		
									PIT	2Y		
0004									LT-1	2Y	VR-33	
990A	SMPL	ISI-27453	Recirculating Pump Discharge Sample	2(A)	1 1/2	GL	MO	С	PIT	2Y		Passive
ļ		(F7)	Isolation						LT-1		VR-33	I ussive
990B	SMPL	ISI-27453	Recirculating Pump Discharge Sample	2(A)	1 1/2	GL	МО	C	PIT	2Y	VIC-33	Passive
		(F6)	Isolation							2 Y	VR-33	Passive
990C	SMPL	ISI-27453	RHR Loop Sample Main Valve	2(A)	3/8	GL	MA		LT-1			Deseries
		(D6)	• •	- </td <td></td> <td>01</td> <td>1012 1</td> <td>C</td> <td>1.1-1</td> <td>21</td> <td>VR-33</td> <td>Passive</td>		01	1012 1	C	1.1-1	21	VR-33	Passive

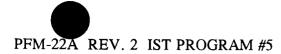
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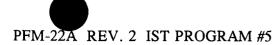
System	Drwg No/Coor	Description	Class/Cat	Size	Type	Actuator	Position	Reom't	Frea	Relief Ren	Notes
				3/4			С				
							-			1.1.2.	
RCS	ISI-27473	Primary Water Supply to PRT Isolation	NC(A)	3	DA	AO	С	EC	OP		
	(F8)	Valve						FST-C	OP		
								PIT	2Y		
								LT-1	2Y	VR-33	
RCS	ISI-27473	PORV Blocking Valve	1(B)	3	GA	MO	0	EO	OP		
	(G1)							EC	OP		
								PIT	2Y		
RCS		PORV Blocking Valve	1(B)	3	GA	MO	0	1			
·	(G1)										
RCS		-	NC(A)	3/8	GL	AO	0	1			
	(G8)	Valve									
1											
				- 10	~*					<u>VR-33</u>	
RCS		-	NC(A)	3/8	GL	AO	0	1			
	(G7)	Valve									
			NG(A)	2/4		10					
RCS		N2 Supply to PRT Isolation Valve	NC(A)	3/4	GA	AO	С	1		VR-1	
	(G8)										
Daa	101.05.150			2	DA	10					
RCS			NC(A)	3	DA	AU	C		1		
	(F8)	Valve	:								
										100 22	
DCG	191 27472	DX Vessel Head Vent Value	1(B)	1	GI	50					CSJ-37
RUS		RX Vessel Head Vent Valve	I(D)	1	UL	50	C			VK-1	C3J-37
PCS	(E4)	DV Vessel Head Vent Valve	1(B)	1	GL	50	C			VR-1	CSJ-37
RUS				•		50	Ŭ				
PCS		RX Vessel Head Vent Valve	1(B)	1	GL.	SO	С			VR-1	CSJ-37
RC3			.(2)	-	~2		Ŭ				0.00 07
RCS		RX Vessel Head Vent Valve	1(B)	1 .	GL	SO	С			VR-1	CSJ-37
IC S	(E5)						-	PIT	2Y		
	RCS RCS	System         No./Coor.           RCS         ISI-27473 (G7)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (G1)           RCS         ISI-27473 (G1)           RCS         ISI-27473 (G1)           RCS         ISI-27473 (G1)           RCS         ISI-27473 (G8)           RCS         ISI-27473 (G8)           RCS         ISI-27473 (G8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (F8)           RCS         ISI-27473 (E4)           RCS         ISI-27473           (E4)         RCS           RCS         ISI-27473           (E4)         RCS           RCS         ISI-27473           (E4)         RCS           RCS         ISI-27473           (E4)         RCS           RCS         ISI-27473	SystemNo./Coor.DescriptionRCSISI-27473N2 Supply to PRT Containment Isolation (G7)RCSISI-27473Primary Water Supply to PRT Isolation ValveRCSISI-27473PORV Blocking Valve(G1)PORV Blocking Valve(G1)RCSISI-27473RCSISI-27473PORV Blocking Valve(G1)RCSISI-27473RCSISI-27473PRT Gas Sample to Analyzer Isolation ValveRCSISI-27473PRT Gas Sample to PRT Isolation ValveRCSISI-27473RX Vessel Head Vent Valve (E4)RCSISI-27473RX Vessel Head Vent Valve (E4)RCSISI-27473RX Vessel Head Vent Valve (E4)RCSISI-27473RX Vessel Head Vent Valve (E5)RCSISI-27473RX Vessel Head Vent Valve	SystemNo./Coor.DescriptionClass/CatRCSISI-27473N2 Supply to PRT Containment Isolation (G7)NC(A/C)RCSISI-27473Primary Water Supply to PRT Isolation ValveNC(A)RCSISI-27473PORV Blocking Valve1(B)(G1)PORV Blocking Valve1(B)RCSISI-27473PORV Blocking Valve1(B)(G1)PORV Blocking Valve1(B)RCSISI-27473PORV Blocking Valve1(B)(G1)PORV Blocking Valve1(B)RCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)RCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)RCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)RCSISI-27473Primary Water Supply to PRT Isolation ValveNC(A)RCSISI-27473RX Vessel Head Vent Valve1(B)(E4)RX Vessel Head Vent Valve1(B)RCSISI-27473RX Vessel Head Vent Valve1(B)(E4)RX Vessel Head Vent Valve1(B)RCSISI-27473RX Vessel Head Vent Valve1(B)(E5)RXISI-27473RX Vessel Head Vent Valve1(B)(E5)RCSISI-27473RX Vessel Head Vent Valve1(B)(E4)RXISI-27473RX Vessel Head Vent Valve1(B)(E5)ISI-27473RX Vessel Head Vent Valve1(B)(E5)ISI-27473RX Vessel Head Vent Valve1(B)(E4	SystemNo./Coor.DescriptionClass/CatSizeRCSISI-27473 (G7)N2 Supply to PRT Containment Isolation (G7)NC(A/C)3/4RCSISI-27473 (F8)Primary Water Supply to PRT Isolation ValveNC(A)3RCSISI-27473 (G1)PORV Blocking Valve1(B)3RCSISI-27473 (G1)PORV Blocking Valve1(B)3RCSISI-27473 	SystemNo./Coor.DescriptionClass/CatSizeTypeRCSISI-27473N2 Supply to PRT Containment Isolation (G7)NC(A/C)3/4CKRCSISI-27473Primary Water Supply to PRT Isolation ValveNC(A)3DARCSISI-27473Primary Water Supply to PRT Isolation (G1)NC(A)3DARCSISI-27473PORV Blocking Valve1(B)3GA(G1)(G1)PORV Blocking Valve1(B)3GARCSISI-27473PORV Blocking Valve1(B)3/8GLRCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLRCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)3/4GARCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)3/4GARCSISI-27473RX Supply to PRT Isolation ValveNC(A)3/4GARCSISI-27473RX Vessel Head Vent Valve1(B)1GLRCSISI-27473RX Vessel Head Vent Valve1(B)1	SystemNo./CoorDescriptionClass/CatSizeTypeActuatorRCSISI-27473N2 Supply to PRT Containment Isolation (G7)NC(A/C)3/4CKSARCSISI-27473Primary Water Supply to PRT Isolation (F8)NC(A)3DAAORCSISI-27473PORV Blocking Valve1(B)3GAMORCSISI-27473PORV Blocking Valve1(B)3GAMORCSISI-27473PORV Blocking Valve1(B)3/8GLAORCSISI-27473PRT Gas Sample to Analyzer Isolation (G8)NC(A)3/8GLAORCSISI-27473PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLAORCSISI-27473 (G7)PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLAORCSISI-27473 (G7)PRT Gas Sample to PRT Isolation ValveNC(A)3/8GLAORCSISI-27473 (G8)N2 supply to PRT Isolation ValveNC(A)3/4GAAORCSISI-27473 (F8)Primary Water Supply to PRT Isolation ValveNC(A)3DAAORCSISI-27473 (F8)RX Vessel Head Vent Valve1(B)1GLSORCSISI-27473 (F8)RX Vessel Head Vent Valve1(B)1GLSORCSISI-27473 (F8)RX Vessel Head Vent Valve1(B)1GLSORCSISI-27473 (E4)RX	SystemNo./Coor.DescriptionClass/CatSizeTypeActuatorPositionRCSISI-27473 (G7)N2 Supply to PRT Containment Isolation (G7)NC(A/C)3/4CKSACRCSISI-27473 (F8)Primary Water Supply to PRT Isolation ValveNC(A)3DAAOCRCSISI-27473 (G1)PORV Blocking Valve1(B)3GAMOORCSISI-27473 (G1)PORV Blocking Valve1(B)3GAMOORCSISI-27473 (G1)PORV Blocking Valve1(B)3/8GLAOORCSISI-27473 (G8)PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLAOORCSISI-27473 (G7)PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLAOORCSISI-27473 (G7)PRT Gas Sample to Analyzer Isolation ValveNC(A)3/8GLAOORCSISI-27473 (G8)N2 upply to PRT Isolation ValveNC(A)3/4GAAOCRCSISI-27473 (F8)RX vessel Head Vent Valve1(B)1GLSOCRCSISI-27473 (F8)RX vessel Head Vent Valve1(B)1GLSOCRCSISI-27473 (F3)RX vessel Head Vent Valve1(B)1GLSOCRCSISI-27473 (F3)RX vessel Head Vent Valve1(B)1GLSOC <t< td=""><td>System         Na./Coor.         Description         Class/Cut         Size         Type         Actuator         Position         Requit           RCS         151-27473         N2 Supply to PRT Containment Isolation         NC(A/C)         3/4         CK         SA         C         EC           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC           (F8)         Valve         1(B)         3         GA         MO         O         EC         FST-C         PIT           (G1)         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         EC           (G1)         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         EC           (G1)         PRT Gas Sample to Analyzer Isolation         NC(A)         3/8         GL         AO         O         EC           (G3)         Valve         N2 for Gas Sample to Analyzer Isolation         NC(A)         3/8         GL</td><td>System         No./Coor.         Description         Class/Cat         Size         Type         Actuator         Pediator         Requit         Freq           RCS         151-27473         N2 Supply to PRT Containment Isolation (G7)         NC(A/C)         3/4         CK         SA         C         EC         2Y           RCS         ISI-27473         Primary Water Supply to PRT Isolation (F8)         NC(A)         3         DA         AOO         C         EC         OP           RCS         ISI-27473         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         OP           RCS         ISI-27473         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         OP           (G1)         0         1(B)         3         GA         MO         O         EC         OP           (G1)         0         1(B)         3         GA         MO         EC         OP           (G1)         0         FRTG assample to Analyzer Isolation         NC(A)         3/8         GL         AOO         O         EC         OP           (G3)         Valve         N2         NC(A)         <td< td=""><td>System         No./Coor.         Description         Class/Cat         Size         Type         Actaato         Position         Requestion         Requestion           RCS         151-27473         N2 Supply to PRT Containment Isolation         NC(A/C)         3/4         CK         SA         C         EC         2Y         VR-20           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC         QP         PRST-C         OP         PST-C         OP         PST-C&lt;</td></td<></td></t<>	System         Na./Coor.         Description         Class/Cut         Size         Type         Actuator         Position         Requit           RCS         151-27473         N2 Supply to PRT Containment Isolation         NC(A/C)         3/4         CK         SA         C         EC           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC           (F8)         Valve         1(B)         3         GA         MO         O         EC         FST-C         PIT           (G1)         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         EC           (G1)         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         EC           (G1)         PRT Gas Sample to Analyzer Isolation         NC(A)         3/8         GL         AO         O         EC           (G3)         Valve         N2 for Gas Sample to Analyzer Isolation         NC(A)         3/8         GL	System         No./Coor.         Description         Class/Cat         Size         Type         Actuator         Pediator         Requit         Freq           RCS         151-27473         N2 Supply to PRT Containment Isolation (G7)         NC(A/C)         3/4         CK         SA         C         EC         2Y           RCS         ISI-27473         Primary Water Supply to PRT Isolation (F8)         NC(A)         3         DA         AOO         C         EC         OP           RCS         ISI-27473         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         OP           RCS         ISI-27473         PORV Blocking Valve         1(B)         3         GA         MO         O         EC         OP           (G1)         0         1(B)         3         GA         MO         O         EC         OP           (G1)         0         1(B)         3         GA         MO         EC         OP           (G1)         0         FRTG assample to Analyzer Isolation         NC(A)         3/8         GL         AOO         O         EC         OP           (G3)         Valve         N2         NC(A) <td< td=""><td>System         No./Coor.         Description         Class/Cat         Size         Type         Actaato         Position         Requestion         Requestion           RCS         151-27473         N2 Supply to PRT Containment Isolation         NC(A/C)         3/4         CK         SA         C         EC         2Y         VR-20           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC         QP         PRST-C         OP         PST-C         OP         PST-C&lt;</td></td<>	System         No./Coor.         Description         Class/Cat         Size         Type         Actaato         Position         Requestion         Requestion           RCS         151-27473         N2 Supply to PRT Containment Isolation         NC(A/C)         3/4         CK         SA         C         EC         2Y         VR-20           RCS         151-27473         Primary Water Supply to PRT Isolation         NC(A)         3         DA         AO         C         EC         QP         PRST-C         OP         PST-C         OP         PST-C<

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		Drwg									Rehei	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm'i	Freq	Req	Notes
PCV-455C	RCS	ISI-27473		1(B)	3	GL	AO	С	EO	CS		CSJ-38
		(G1)							PIT	2Y		
PCV-456	RCS	ISI-27473	PORV	1(B)	3	GL	AO	С	EO	CS		CSJ-38
		(G1)							PIT	2Y		
PCV-464	RCS	ISI-27473	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	С	SP	5Y	VR-36	
		(G2)										
PCV-466	RCS	ISI-27473	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	С	SP	5Y	VR-36	
		(G3)										
PCV-468	RCS	ISI-27473	Pressurizer Safety Relief Valve	1(C)	6	SF	SA	С	SP	5Y	VR-36	
		(G3)										

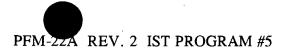


Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom's	Erne	Relief Req	Notes
13	SI	ISI-27503	Spray Add. Tank Vac. Rel.	3(C)	1	SF	SA	C	SP	10Y	VR-36	inches
		(F7)			-		0/1	Ŭ			VK-30	
14	SI	ISI-27503	Spray Add. Tank Vac. Rel.	3(C)	1	SF	SA	С	SP	10Y	VR-36	
		(F7)										
1807B	SI	ISI-27503	#32 Safety Injection Pump Min Flow	2(B)	3/4	GL	MA	0	EO	OP	<u> </u>	
		(F3)	Isolation Valve						EC	OP		
1810	SI	ISI-27503	RWST Outlet Isolation Valve	2(B)	8	GA	MO	0	EC	CS		CSJ-47
		(F4)							PIT	2Y		
1814A	SI	ISI-27503	Containment Pressure Sensing	NC(A)	3/4	GL	MA	0	LT-1	2Y		Passive
		(F8)										
1814B	SI	ISI-27503	Containment Pressure Sensing	NC(A)	3/4	GL	MA	0	LT-1	2Y		Passive
<u> </u>		(E8)										
1814C	SI	ISI-27503	Containment Pressure Sensing	NC(A)	3/4	GL	MA	0	LT-1	2Y		Passive
		(E8)										
1823	SI	ISI-27503	Boric Acid Injection Safety Relief Valve	2(C)	3/4	SF	SA	C	SP	10Y	VR-36	
		(G7)										
1835A	SI		BIT Outlet Valve	2(A)	4	GA	MO	С	EO	OP		
		(G7)							EC	OP		
									LT-1	2Y		
									PIT	2Y		
1835B	SI		BIT Outlet Valve	2(A)	4 ·	GA	MO	С	EO	OP		
		(G7)							EC	OP		
									LT-1	2Y		
				2(0)					PIT	2Y	<b> </b>	
1838A	SI	ISI-27503	Spray Add. to Educt. #31	2(C)	3	СК	SA	C	EO	CS		CSJ-48
		(D4)		2(0)		OV			EC	RR	VR-47	
1838B	SI		Spray Add. to Educt. #32	2(C)	3	CK	SA	С	EO	CS		CSJ-48
	~~~~	(C4)		200		<u></u>	<u> </u>	~	EC	RR	VR-47	
1852A	SI		BIT Inlet Valve	2(B)	4	GA	MO	С	EO	OP		
		(G5)							PIT	2 Y	L	
1852B	SI		BIT Inlet Valve	2(B)	4	GA	MO	С	EO	OP		
		(G5)		2(D)		DU		~	PIT	2Y		
1863	SI	(C4)	RHR Pump Discharge to SIS	2(B)	8	BU	MA	С				Passive
842	SI	ISI-27503	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	0	EC	CS		CSJ-39
		(E3)							PIT	2Y		

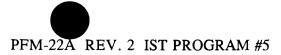
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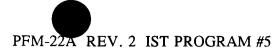
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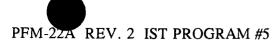
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom't	Frea	Relief Req	Notes
843	SI	ISI-27503	SI Pump Recirculation Isolation Valve	2(B)	2	GL	MO	0	EC	CS		CSJ-39
		(E3)							PIT	2Y		
846	SI	ISI-27503	RWST Isolation Valve	2(B)	14	GA	MA	0	EC	CS		CSJ-40
	ļ	(G3)				ļ						
847	SI	ISI-27503	SIS Pump Suction	2(C)	8	CK	SA	С	PEO	OP		CSJ-41
		(F3)							EO	RR	VR-21	
0.404	GI	101.05.000		2(0)		OT			EC	CS		
849A	SI	ISI-27503	SIS Pump #31 Discharge Isolation Valve	2(C)	4	СК	SA	С	PEO	OP		
		(F4)							EO	RR	VR-22	
849B	SI	ISI-27503	SIS Pump #33 Discharge Isolation Valve	2(0)		CV			EC	OP	<u> </u>	
8495	51		SIS Pump #33 Discharge Isolation Valve	2(C)	4	СК	SA	С	PEO	OP		
		(G4)							EO	RR	VR-22	
850A	SI	ISI-27503	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	0	EC EO	OP OP		
830A	51	(F5)	SIST unip #51 Discharge isolation valve	2(A)	4		IVIO	0	EO EC	OP OP		
		(1.5)								2Y	VR-33	
										2 Y 2Y	VK-33	-
850C	SI	ISI-27503	SIS Pump #31 Discharge Isolation Valve	2(A)	4	GA	MO	0	EO	OP		
0000	U.	(F5)	510 · milp 10 · 2 · 5 · 5 · 5 · 5 · 5 · 5 · 5 · 5 · 5	-()		0.1		Ū	EC	OP		
		(19)							LT-1	2Y	VR-33	
	· · ·								PIT	2Y		
851A	SI	ISI-27503	SIS Pump #32 Discharge Isolation Valve	2(A)	4	GA	MO	0	EO	OP		
		(F5)							EC	OP		
									LT-1	2Y	VR-33	
									PIT	2Y		
851B	SI	ISI-27503	SIS Pump #32 Discharge Isolation Valve	2(B)	4	GA	MO	0	EO	OP		
		(F5)							EC	OP		
									PIT	2Y		
852A	SI	ISI-27503	SIS Pump #32 Discharge Isolation Valve	2(C)	4	СК	SA		PEO	OP		
		(F5)							EO	RR	VR-22	-
									EC	OP		
852B	SI	ISI-27503	SIS Pump #32 Discharge Isolation Valve	2(C)	4	CK	SA		PEO	OP		
		(G5)							EO	RR	VR-22	
				2(4)	2/1			0	EC	OP		
859A	SI	ISI-27503 (H7)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	C .	LT-1	2Y	VR-33	Passive



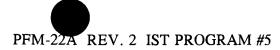
Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
859C	SI	ISI-27503 (H7)	SIS Pump Test Isolation Valve	2(A)	3/4	GL	MA	С	LT-1	2Y	VR-33	Passive
866A	SI	ISI-27503	Containment Spray Pump #31 Discharge	2(B)	8	GA	MO	C	EO	OP		
		(D6)	Valve						EC	OP		
									PIT	2Y		
866B	SI	ISI-27503	Containment Spray Pump #32 Discharge	2(B)	8	GA	MO	С	EO	OP		
		(D6)	Valve						EC	OP		
									PIT	2Y		
867A	SI	ISI-27503	Containment Spray Pump #31 Discharge	2(A/C)	8	CK	SA	С	PEO	OP		
		(D6)	Valve						EO	RR	VR-23	
				•					EC	2Y	VR-23	
									LT-1	2Y	VR-33	
867B	SI	ISI-27503	Containment Spray Pump #32 Discharge	2(A/C)	8	СК	SA	С	PEO	OP		
		(D6)	Valve						EO	RR	VR-23	
									EC	2Y	VR-23	
									LT-1	2Y	VR-33	· ·
869A	SI	ISI-27503	Containment Spray Pump #31 Discharge	2(A)	8	GA	MA	0	EC	OP		
		(D8)	Valve						LT-1	2Y	VR-33	
869B	SI	ISI-27503	Containment Spray Pump #32 Discharge	2(A)	8	GA	MA	0	EC	OP		
		(D8)	Valve						LT-1	2Y	VR-33	
876A	SI	ISI-27503	Spray Additive to Educt.	3(B)	3	DA	AO		EO	CS		CSJ-42
		(E6)							EC	CS		
									FST-O	CS		
									PIT	2Y		
876B	SI	ISI-27503	Spray Additive to Educt.	3(B)	3	DA	AO		EO	CS		CSJ-42
		(D6)							EC	CS		
									FST-O	CS		
									PIT	2Y		
878A	SI	ISI-27503 (D6)	Containment Spray Pump Isolation Valve	2(A)	3/4	GL	MA		LT-1	2Y	VR-33	Passive
878B	SI	ISI-27503	Containment Spray Pump Test Isolation	2(A)	3/4	GL	MA	С	LT-1	2Y	VR-33	Passive
		(D6)	Valve									
881	SI	ISI-27503	RHR Pump Suction	2(C)	12	СК	SA	С	PEO	OP		
		(B3)							EO	RR	VR-24	
882	SI	ISI-27503	RHR Pump Suction	2(B)	12	GA	MO		EC	CS		CSJ-43
		(B3)							PIT	2Y		



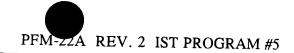
Value No	Suctom	Drwg No./Coor.	Description	Class/Cat	¢:	<b>T</b>	1	Desiden	<b>D</b>	E	Relief	
883	SI		RHR Pump Discharge to SIS Isolation				Actuator				Req	Notes
883	51			2(B)	8	GA	МО	С	EO	CS		CSJ-44
884A	SI	(C5) ISI-27503	Valve SIS Pump to #31 Min-Flow	2(0)	3/4	СК	SA		PIT	2Y		
004A	51		SIS Pump to #31 Min-Flow	2(C)	3/4		SA	С	EO	OP		
884B	SI	(F4) ISI-27503	SIS Pump to #32 Min-Flow	2(0)	3/4	CK	SA		EO			
884D		(F4)	515 Fullp to #52 Mill-Flow	2(C)	5/4	CK	SA	C	EO	OP		
884C	SI	ISI-27503	SIS Pump to #33 Min-Flow	2(C)	3/4	CK	SA	С	EO	OP		
004C	51	(G4)	313 Fump to #55 Mm-110w	2(0)	5/4	CK	SA		EO	OP		
885A	SI	ISI-27503	Containment Sump RHR Suction	2(A)	14	GA	МО	С	EO	CS		CSJ-45
00JA	51	(B8)	Isolation Valve	2(A)	14	UA	IVIO	C	EC	CS CS		CSJ-45
		(66)										
									PIT	2Y		
885B	SI	ISI-27503	Containment Sump RHR Suction	2(A)	14	GA	MO	С	LT-1 EO	2Y CS		001/5
D	51			Z(A)	14	0A	MO	C				CSJ45
		(B7)	Isolation Valve						EC	CS		
									PIT	2Y		
887A	SI	101.07502	#32 SI Pump Suction Isolation Valve	2(B)	6	GA	MO	· 0	LT-1 EO	2Y OP		
58/A	51		#32 SI Pump Suction Isolation Valve	2(D)	0	0A	MO	0		1		
		(F4)							EC	OP		
887B	SI	ISI-27503	#32 SI Pump Suction Isolation Valve	2(B)	6	GA	MO	0	PIT EO	2Y OP		
50/D	51		#32 SI Fump Suction Isolation Valve	2(13)	0	UA	MO	0	EC EC	OP OP		
	•	(F4)							EC PIT			
388A	SI	ISI-27503	Low Head to High Head SI Recirculation	2(A)	6	GA	MO	C	EO	2Y CS		CSJ-46
300A	51		Stop Valve	2(A)	U	UA	IVIO	C	EC	CS CS		CSJ-40
		(D7)	Stop varve						LT-1	CS 2Y		
									PIT			
388B	SI	ISI-27503	Low Head to High Head SI Recirculation	2(A)	6	GA	MO	С	EO	2Y CS		CSJ-46
000	51		Stop Valve	2(1)	5	UA	1410		EC	CS CS		C3J-40
		(C7)	Supvarve				مسير بدر الم		EC LT-1	CS2Y		
398	SI	ISI-27503	#32 SIS Pump RWST Suction	2(B)	6	GA	MA	С	PIT EO	2Y OP		
570	51	(F3)	#52 515 Fullp R w 51 Suction	2(D)		UA	1417.2		ĽU	or		



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reom't	Fran	Relief Req	Notes
13	CC		Radiation Monitor Condenser Sample	3(B)	3/4	GL	MA	0			335	Passive
		SH1 (E6)	Cooler Supply Isolation	- <- /				Ŭ				assive
14	CC	ISI-27513	Radiation Monitor Condenser Sample	3(B)	3/4	GL	MA	0		1		Passive
		SH1 (C8)	Cooler Return Isolation					~				1 433170
1805	CC	ISI-27513	Flash Evaporator Product Cooler CCW	3(B)	4	GA	MA	0		<u> </u>		Passive
		SH1 (C7)	Return Isolation Valve									
1850	CC	ISI-27513	Flash Evaporator Product Cooler CCW	3(B)	4	GA	MA	0		_		Passive
		SH1 (D6)	Supply Isolation Valve									
1870	RHR	ISI-27513	RHR Pump Mini Flow Isolation	2(A)	2	GL	MO	0	EO	CS		CSJ-57
		SH1 (G1)	~						EC	CS		
									LT-1	2Y	VR-33	
									PIT	2Y		
500	CC		Radiation Monitor Return Isolation	3(B)	2	GL	MA	0				Passive
		SH1 (D8)	Valve									
701A	CC		City Water to Charging Pumps	3(B)	2	GL	MA	С	EO	OP		
		SH1 (B3)										
701B	CC		City Water from Charging Pumps	3(B)	2	GL	MA	С	EO	OP		
		SH1 (B3)										-
732	RHR		#32 Loop Hot Leg to RHR Pumps	2(A)	14	GA	MA	С	EO	OP		
		SH1 (H2)	Suction Isolation							2Y		
738A	RHR	ISI-27513	RHR Pump #31 Discharge	2(C)	8	CK	SA	C	PEO	OP		CSJ-49
		SH1 (F3)							EO	CS		
									EC	OP		
738B	RHR		RHR Pump #32 Discharge	2(C)	8	СК	SA		PEO	OP		CSJ-49
		SH1 (G3)							EO	CS		
									EC	OP		
743	RHR		RHR Pump Mini Flow Isolation	2(A)	3	GA	MO		EO	CS		CSJ-50
		SH1 (H2)							EC	CS		
									LT-I	2Y	VR-33	
7.4.4		101.05.010		2(4)	10	<u></u>	1/0		PIT	2Y	·	
744	RHR		RHR Pump Discharge to RHR HX	2(A)	12	GA	MO		EO	CS		CSJ-51
		SH1 (H3)	Isolation						EC	CS		
									LT-1	2Y		
	00	101.07610	COW From SIS Dump #21 Cooler Charles	2(())		СК				2Y		
750A	СС		CCW From SIS Pump #31 Cooler Check	3(C)	1	UK	SA	0	EO	OP		
		SH1 (C3)										



		Drwg									Relief	
Valve No.	System	No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Req	Notes
750B	CC	ISI-27513	CCW From SIS Pump #32 Cooler Check	3(C)	1	CK	SA	0	EO	OP		
		SH1 (B3)										
750C	CC	ISI-27513	CCW From SIS Pump #33 Cooler Check	3(C)	1	CK	SA	0	EO	OP		
		SH1 (A3)										
750D	CC	ISI-27513	CCW From RHR Pump #32 Seal	3(C)	1	CK	SA	0	EO	OP	1	
	•	SH1 (G3)			Į							
750E	CC	ISI-27513	CCW From RHR Pump #31 Seal	3(C)	1	CK	SA	0	EO	OP		
		SH1 (F3)										
751A	CC		Cooling Water to RHR HX #31	3(C)	12	СК	SA	0	EO	OP		
		SH1 (H4)			ļ				EC	RR	VR-49	
751B	CC		Cooling Water to RHR HX #32	3(C)	10	СК	SA	0	EO	OP		
		SH1 (H4)			ļ				EC	RR	VR-49	,
755A	CC		Aux. Component Cooling Pump Bypass	3(C)	2	СК	SA	0	EC	OP		
		SH1 (G5)	Check			<u> </u>					L	
755B	CC	ISI-27513	Aux. Component Cooling Pump #31	3(C)	2	СК	SA	0	EO	OP		
			Discharge Check		<u> </u>				EC	OP		
755C	CC		Aux. Component Cooling Pump #32	3(C)	2	СК	SA	0	EO	OP		
		SH1 (G5)	Discharge Check	2(0)		au			EC	OP		
755D	CC		Aux. Component Cooling Pump Bypass	3(C)	2	CK	SA	0	EC	OP		
		SH1 (G5)	Valve (22)	2(0)			<u> </u>			L		
755E	CC		Aux. Component Cooling Pump #33	3(C)	2	СК	SA	0	EO	OP		
		SH1 (G6)	Discharge Check	2(0)		OV			EC	OP		
755F	CC		Aux. Component Cooling Pump #34	3(C)	2	CK	SA	0	EO	OP		
7764		SH1 (G6)	Discharge Check	3(B)	3	GA	MA		EC	OP		
756A	СС		Charging Pump CCW Supply Isolation	3(Б)	5	0A	MA	0	EC	CS		CSJ-52
756B	00	SH1 (B3)	Charging Pump CCW Return Isolation	3(B)	3	GA	MA	0	ÉC			001.50
/20B	CC		Charging Pump CC w Return Isolation	3(B)	3	GA	IVIA	0	EC	CS		CSJ-52
759C	СС	<u>SHI (B3)</u>	CCW Pumps Discharge Header Isolation	3(B)	14	GA	MA	0	EC	OP		
7390	u		CC w Fullips Discharge Fleader Isolation	5(D)	14	UA	IVIA	0	EC	OF		
759D	CC	SH1 (C6) ISI-27513	CCW Pumps Discharge Header Isolation	3(B)	14	GA	MA	0	EC	OP		
עלני		SH1 (B6)	CC W I unips Discharge Fleader Isolation	5(1)	1 4		IATLA	0		or	1	
761A	СС	ISI-27513	Component Cooling Pump #31	3(C)	10	СК	SA	0	EO	OP	<u> </u>	
INA .			Discharge Valve		· ·		<i></i>	0	EC	OP	1	
761B	CC	ISI-27513	Component Cooling Pump #32	3(C)	10	СК	SA	0	EO	OP		
			Discharge Valve		``		~11	0	EC	OP	Ì	
		STI (D0)	Discharge valve		I	1					L	



.

		Drwg					1				88 880 in 19995 X 2000	2 9000000000000000000000000000000000000
		No./Coor		Class/Cat	Size	Type	Actuator	Position	Reqm't	Error	Relie Req	4
761C	CC	ISI-27513	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3(C)	10	CK	SA	0	EO	OP		Notes
766A	CC	SH1 (B6)	Discharge Valve						EC	OP		
TOOA		ISI-27513	CCW Pumps Suction Header Isolation	3(B)	12	GA	MA	0	EC	OP	+	
766B	CC	<u>SH1 (B7)</u> ISI-27513	COMPACTOR									· ·
1000			CCW Pumps Suction Header Isolation	3(B)	12	GA	MA	0	EC	OP	<u> </u>	<u> </u>
766C	CC	SH1 (B7) ISI-27513	CCW Heat Fundamental Constant		L							
1000	cc	SH1 (C5)	CCW Heat Exchanger Cross Connect	3(B)	12	GA	MA	0	EC	OP		+
766D	CC	ISI-27513	Isolation									:
	00	SH1 (C5)	CCW Heat Exchanger Cross Connect Isolation	3(B)	12	GA	MA	0	EC	OP	<u> </u>	<u> </u>
769	CC		RCP Seal & Bearing Coolers and Vessel		<u> </u>						1	
	00	SH1 (H4)	Cooling Support Blocks CCW Supply	3(A)	6	GA	MO	0	EC	CS		CSJ-53
		5111 (114)	Isolation						LT-1	2Y	VR-33	
									PIT	2Y		
784	CC	ISI-27513	RCP Bearing Coolers and Vessel	3(A)								
		SH1 (H7)	Cooling Support Blocks CCW Return	5(A)	6	GA	MO	0	EC	CS		CSJ-54
		()	Isolation						LT-1	2Y	VR-33	
									PIT	2Y		
86	CC	ISI-27513	RCP Bearing Coolers and Vessel	3(A)	6	GA	МО	0	20			
		SH1 (H7)	Cooling Support Blocks CCW Return	0(.1)	Ŭ		MO			CS		CSJ-54
			Isolation							2Y	VR-33	
									PIT	2Y		
89			RCP Seal CCW Return Isolation	3(A)	3	GA	МО	0	EC	cs		
		SH1 (G7)						1				CSJ-55
				!						21 2Y	VR-33	
91										21		
91		ISI-27513	Excess Letdown HX CCW Supply	3(A)	3	DA	AO	0	EC	OP .		
		SH1 (H4)	Isolation					1		OP		
									1		VR-33	
93	CC	ISI-27513								2Y	, 1(-55	
			Excess Letdown HX CCW Return	3(A)	3	DA	AO			OP		· · · · · · · · · · · · · · · · · · ·
		SH1 (G7)	solation					1	ST-C	OP		
								1	LT-1	2Y	VR-33	
								· II	PIT Z	2Y		

# PFM-22A REV. 2 IST PROGRAM #5

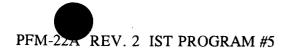
		Drwg									Relief	
	System	No./Coor.		Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Req	Notes
796	CC	ISI-27513	Excess Letdown HX CCW Return	3(A)	3	DA	AO	0	EC	OP		
		SH1 (H7)	Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
					<u> </u>				PIT	2Y		
797	CC		RCP Seal & Bearing Coolers and Vessel	3(A)	6	GA	MO	0	EC	CS		CSJ-53
		SH1 (H4)	Cooling Support Blocks CCW Supply						LT-1	2Y	VR-33	
700		101.07.010	Isolation						PIT	2Y		
798	CC		Excess Letdown HX CCW Supply	<sup>3(A)</sup> .	3	DA	AO	0	EC	OP		
		SH1 (G4)	Isolation						FST-C	OP		
									LT-1	2Y	VR-33	
799A	60	101.07510				<u>ar</u>			PIT	2Y		
799A	СС	ISI-27513	Sample Heat Exhangers CCW Supply	3(B)	3	GL	MA	0				Passive
799B	СС	SH1 (C3) ISI-27513	Isolation Sample Heat Exhangers CCW Return	3(B)	3	CI				L		
7990		SH1 (C3)	Isolation	3(B)	3	GL	MA	0				Passive
810	СС		NRHX Inlet Isolation	3(B)	6	GA	MA	0	50			
010		SH1 (D3)		5(B)	0	0A	IVLA	U	EC	CS		CSJ-56
814	СС		NRHX Outlet Isolation	3(B)	6	GA	MA	0	EC	CS		001.56
011	00	SH1 (E1)		5(15)	Ŭ	0A	14171	0	EC	CS		CSJ-56
815A	CC		S/G Sample Heat Echangers CCW	3(B)	2	GL	MA	0				Passive
			Supply Isolation	0(2)	2	0.5	14771	U				rassive
815B	CC		S/G Sample Heat Echangers CCW	3(B)	2	GL	MA	0				Passive
			Return Isolation					0				assive
822A	CC		#31 RHR HX CCW Outlet Isolation	3(B)	12	GA	MO	С	EO	OP		
		SH1 (H8)	Valve						PIT	2Y		
822B	CC	ISI-27513	#32 RHR HX CCW Outlet Isolation	3(B)	12	GA	MO	С	EO	OP		
			Valve						PIT	2Y		
837	RHR	ISI-27513	RHR Pump #31 Mini-flow	2(C)	3	CK	SA	С	EO	OP		
		SH1 (G2)										
838	RHR	ISI-27513	RHR Pump #32 Mini-flow	2(C)	3	CK	SA	С	EO	OP		
		SH1 (H3)										
FCV-625	CC		RCP Seal CCW Return Isolation	3(A)	3	GA	MO		EC	CS		CSJ-55
		SH1 (H7)							LT-I	2Y	VR-33	
										2Y		
109	FPC		#32 Spent Fuel Pit Pump Discharge	3(C)	8	CK	SA		EO	OP		
		SH2 (E6)	Check						EC	OP		

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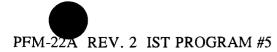


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Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
53	FPC	ISI-27513	#31 Spent Fuel Pit Pump Discharge	3(C)	8	СК	SA	0	EO	OP		
		SH2 (F6)	Check						EC	OP		



Valve No.				Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
FCV-1170	HVAC	ISI-40223	Containment Building Purge Inside	NC(A)	36	BU	AO	С	EC	CS	VR-1	CSJ-58
		(G6)	Supply Valve						FST-C	CS		
				i					PIT	2Y		
FOULINE	TITLE								LT-1	2Y	VR-33	
FCV-1171	HVAC	ISI-40223	Containment Building Purge Outside	NC(A)	36	BU	AO	С	EC	CS	VR-1	CSJ-58
		(G5)	Supply Valve						FST-C	CS		
									PIT	2Y		
ECV 1172	TIMAG	101 40222							LT-1	2Y	<u>VR-33</u>	
FCV-1172	HVAC	ISI-40223	Containment Building Purge Outside	NC(A)	36	BU	AO		EC	CS	VR-1	CSJ-58
		(G5)	Exhaust Valve						FST-C	CS		
									PIT	2Y		
FCV-1173	HVAC	ISI-40223	Containment Duilding Dungs Inside	NIC(A)	26	DU			LT-1	2Y	VR-33	
IC V-11/5	HVAC		Containment Building Purge Inside Exhaust Valve	NC(A)	36	BU	AO		EC	CS	VR-1	CSJ-58
ľ		(G4)							FST-C	CS		
										2Y		
PCV-1190	HVAC	ISI-40223	Containment Building Inside Pressure	NC(A)	10	BU	AO		LT-1 EC	<u>2Y</u>	VR-33	
	IIVAC		Relief Valve	NC(A)	10	ЪU	AU			OP		
		(В8)	Relief Valve							OP		
1										2Y		
PCV-1191	HVAC	ISI-40223	Containment Building Outside Pressure	NC(A)	10	BU	AO		LT-1 EC	2Y OP	<u>VR-33</u>	
	nino		Relief 2nd Valve	110(11)	10	50	AU		EC FST-C	OP OP		
		(D7)							PIT	OP 2Y		
											VD 22	
PCV-1192	HVAC	ISI-40223	Containment Building Outside Pressure	NC(A)	10	BU	AO			<u>2 Y</u> OP	VR-33	
			Relief 3rd Valve							OP 0		
		()								2Y		
											VR-33	



Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Туре	Actuator	Position	Reqm't	Freq	Relief Req	Notes
PCV-1234	SMPL	ISI-70453	Containment Isolation Valve To PASS	NC(A)	1	DA	AO		EC	OP		
		(C7)							FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1235	SMPL	ISI-70453	Containment Isolation Valve To PASS	NC(A)	1	DA	AO	0	EC	OP		
		(C7)							FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1236	SMPL	ISI-70453	Containment Isolation Valve To PASS	NC(A)	1	DA	AO		EC	OP		
		(C8)							FST-C	OP		
									PIT	2Y		
									LT-1	2Y	VR-33	
PCV-1237	SMPL		Containment Isolation Valve To PASS	NC(A)	1	DA	AO		EC	OP		
		(C8)							FST-C	OP		
									PIT	2Y		
			·						LT-1	2Y	VR-33	



.

Valve No.	System	Drwg No./Coor.	Description	Class/Cat	Size	Type	Actuator	Position	Reqm't	Freq	Relief Req	Notes
CB-1	PAEH	N/A	Personnel Airlock Equalizer	NC(A/C)	1	СК	SA	С	EC	2Y	VR-31	
									LT-1	2 Y	VR-33	
CB-2	PAEH	N/A	Personnel Airlock Equalizer	NC(A/C)	1	CK	SA	C	EC	2Y	VR-31	
									<u>LT-1</u>	2Y	VR-33	
CB-3	PAEH	N/A	Personnel Airlock Equalizer	NC(A)	3	GL	MA	С	LT-1	2 Y		Passive
CB-4	PAEH	N/A	Personnel Airlock Equalizer	NC(A)	3	GL	MA	С	LT-1	2Y		Passive
CB-5	PAEH	N/A	Equipment Hatch Equalizer	NC(A/C)	1	СК	SA	С	EC	2Y	VR-31	
									LT-1	2Y	VR-33	
CB-6	PAEH	N/A	Equipment Hatch Equalizer	NC(A/C)	1	CK	SA	С	EC	2Y	VR-31	
									LT-1	2Y	VR-33	
CB-7	PAEH	N/A	Equipment Hatch Equalizer	NC(A)	3	GL	MA	C	LT-1	2Y		Passive
CB-8	PAEH	N/A	Equipment Hatch Equalizer	NC(A)	3	GL	MA	С	LT-1	2 Y		Passive

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#### NOTES TO APPENDIX B

- 1. The normal plant operation, the charging alignment establishes valves 204A closed and 204B open. This necessarily allows exercising check valves 210B and 210D during plant operation while 210A and 210C are isolated. In the event that the CVCS system charging alignment is reversed (ie. 204A open and 204B closed), the testing requirements for 210 A-D will be reversed and 210A and 210C will required quarterly exercising while 210B and 210D will be exercised during cold shutdown.
- 2. Valves that are not within the designated Indian Point 3 ISI boundaries (NC classed) are not under the jurisdiction of ASME B&PV Code, Section XI and associated testing may not necessarily meet <u>all</u> requirements established therein. Relief requests are provided for information only and do not necessarily require approval.

### PFM-22A REV. 2 INSERVICE TESTING PROGRAM #5

Appendix C

### COLD SHUTDOWN VALVE TESTING JUSTIFICATION

# APPENDIX C

# Cold Shutdown Justifications

# <u>CSJ-1</u>

System:	MS				
Drawing:	ISI-20173				
Components:	MS-1-31 MS-1-32 MS-1-33 MS-1-34	<ul> <li>31 Steam Generator Main Steam Isolation</li> <li>32 Steam Generator Main Steam Isolation</li> <li>33 Steam Generator Main Steam Isolation</li> <li>34 Steam Generator Main Steam Isolation</li> </ul>			
Normal Function	Air assisted open to p	ir assisted open to provide flowpaths for steam to the main turbine generator and auxiliaries.			
Safety Function:	Close during MSLB d	lose during MSLB inside containment to prevent blowdown of more than 1 S/G. lose during MSLB downstream of MSIV to isolate steam break. lose during SGTR to isolate faulted S/G.			
Testing Requirement:	EC and FST-C				
CS Justification:	Closing any of these v trip.	valves during operation would result in an unacceptable transient and plant			
		<u>CSJ-2</u> (Augmented)			
System:	MS				
Drawing:	ISI-20173				
Components:	MS-2-31 MS-2-32 MS-2-33 MS-2-34	<ul> <li>31 Steam Generator Main Steam Non-Return Check</li> <li>32 Steam Generator Main Steam Non-Return Check</li> <li>33 Steam Generator Main Steam Non-Return Check</li> <li>34 Steam Generator Main Steam Non-Return Check</li> </ul>			
Normal Function	Open to provide flowp	paths for steam to the main turbine generator and auxiliaries.			
Safety Function:		upstream of an MSIV to prevent blowdown of more than 1 S/G. n in the accident analysis for these valves.			
Testing Requirement:	A-EC				
CS Justification:	Closing any of these v trip.	valves during operation would result in an unacceptable transient and plant			

### **APPENDIX C**

# **Cold Shutdown Justifications**

### <u>CSJ-3</u>

System:	MS	
Drawing:	ISI-20173	·
Components:	PCV-1134 PCV-1135 PCV-1136 PCV-1137	<ul> <li>31 Steam Generator Main Steam Atmospheric Relief Valve</li> <li>32 Steam Generator Main Steam Atmospheric Relief Valve</li> <li>33 Steam Generator Main Steam Atmospheric Relief Valve</li> <li>34 Steam Generator Main Steam Atmospheric Relief Valve</li> </ul>
Normal Function	Provide a means of S/	G pressure control if the high pressure steam dump is not available.
Safety Function:	unavailable as a heat	e a means of controlling RCS heat rejection when the main condenser is sink. sink. sed during MSLB to not increase the severity of the cooldown transient.
<b>Testing Requirement:</b>	EO, EC, and FST-C	
CS Justification:	Opening any of these the potential for excee	valves during operation would result in an undesirable power transient with eding reactor core power limits.
		<u>CSJ-4</u>
System:	COND	
Drawing:	ISI-20183	
Components:	1158-1	Condensate Storage Tank Low-Level Isolation Valve
Normal Function	Normally open to allo	w condensate makeup to the main condensers.
Safety Function:	Closes on low CST le	vel to maintain a minimum of 360,000 collops for ARED exercises for at

Safety Function:Closes on low CST level to maintain a minimum of 360,000 gallons for ABFP operation for at<br/>least 24 hours following a plant trip from 100% power.

Testing Requirement: EC and FST-C

CS Justification: Closing either of these valves during operation would result in a loss of condenser makeup.

# APPENDIX C

### Cold Shutdown Justifications <u>CSJ-5</u> (Augmented)

System:	COND					
Drawing:	ISI-20183					
Components:	1158-2	Condensate Storage Tank Low-Level Isolation Valve				
Normal Function	Normally open to allo	w 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	* <sup>*</sup>				
CS Justification:	Closing either of these	e valves during operation would result in a loss of condenser makeup.				
		<u>CSJ-6</u>				
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 ABF	Closes to isolate ABFP minimum recirculation flow line from non-seismic portions of pipe.				
Testing Requirement:	EC					
CS Justification:	Closing CT-107 durin for an extended period	ng power operations requires securing condensate recirculation to the CST d of time.				



## **Cold Shutdown Justifications**

## <u>CSJ-7</u>

System:	COND	
Drawing:	ISI-20183	
Components:	CT-26 CT-32	#31 Aux. Feed Pump Suction From CST #33 Aux. Feed Pump Suction From CST
Normal Function	whenever a negative	Il provide passive means to isolate nonoperating sections of the system pressure gradient exists across the valve. In addition, the check valves shall w 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:	each motor driven AE	on, exercising these values to their open position would require operating BFP and injecting cold water into the steam generators. This could result in feedwater supply piping and steam generator nozzles.
	а.	<u>CSJ-8</u>
System:	FW	
Drawing:	ISI-20193	
Components:	BFD-34 BFD-39	#31 Aux. Feed Pump Discharge Check #33 Aux. Feed Pump Discharge Check
Normal Function	whenever a negative	Il provide passive means to isolate nonoperating sections of the system pressure gradient exists across the valve. In addition, the check valves shall w 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:	each motor driven Al	on, exercising these valves to their open position would require operating BFP and injecting cold water into the steam generators. This could result in feedwater supply piping and steam generator nozzles.



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## **Cold Shutdown Justifications**

## <u>CSJ-9</u>

System:	FW		
Drawing:	ISI-20193		
Components:	BFD-31 BFD-47-1 BFD-47-2 BFD-47-3 BFD-47-4	<ul> <li>#32 Aux. Feed Pump Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> </ul>	
Normal Function	whenever a negative	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.		
		<u>CSJ-10</u>	
System:	FW		
Drawing:	ISI-20193		
Components:	BFD-35 BFD-37 BFD-40 BFD-42	<ul> <li>#31 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#31 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#33 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#33 Aux. Feed Pump Flow Control Valve Discharge Check</li> </ul>	
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:	each motor driven AE	on, exercising these values to their open position would require operating FP and injecting cold water into the steam generators. This could result in eedwater supply piping and steam generator nozzles.	

# **Cold Shutdown Justifications**

### <u>CSJ-11</u>

System:	FW	
Drawing:	ISI-20193	
Components:	BFD-47-1 BFD-47-2 BFD-47-3 BFD-47-4	<ul> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> <li>#32 Aux. Feed Pump Flow Control Valve Discharge Check</li> </ul>
Normal Function	whenever a negative	Ill provide passive means to isolate nonoperating sections of the system pressure gradient exists across the valve. In addition, the check valves shall w when a positive pressure gradient is present.
Safety Function:	whenever a negative	Il provide passive means to isolate nonoperating sections of the system pressure gradient exists across the valve. In addition, the check valves shall w 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.	
		<u>CSJ-12</u>
System:	FW	
Drawing:	ISI-20193	
Drawing: Components:	ISI-20193 BFD-6-1 BFD-6-2 BFD-6-3 BFD-6-4	<ul> <li>#31 Steam Generator Feedwater Supply Check</li> <li>#32 Steam Generator Feedwater Supply Check</li> <li>#33 Steam Generator Feedwater Supply Check</li> <li>#34 Steam Generator Feedwater Supply Check</li> </ul>
-	BFD-6-1 BFD-6-2 BFD-6-3 BFD-6-4 Normally open to sup	<ul> <li>#32 Steam Generator Feedwater Supply Check</li> <li>#33 Steam Generator Feedwater Supply Check</li> <li>#34 Steam Generator Feedwater Supply Check</li> <li>ply main feedwater to the S/Gs.</li> <li>ans to prevent backflow from the S/G's into the feedwater system while the</li> </ul>
Components:	BFD-6-1 BFD-6-2 BFD-6-3 BFD-6-4 Normally open to sup Provide a passive mea main boiler feed pum	<ul> <li>#32 Steam Generator Feedwater Supply Check</li> <li>#33 Steam Generator Feedwater Supply Check</li> <li>#34 Steam Generator Feedwater Supply Check</li> <li>ply main feedwater to the S/Gs.</li> <li>ans to prevent backflow from the S/G's into the feedwater system while the</li> </ul>
Components: Normal Function	BFD-6-1 BFD-6-2 BFD-6-3 BFD-6-4 Normally open to sup Provide a passive mea main boiler feed pum	<ul> <li>#32 Steam Generator Feedwater Supply Check</li> <li>#33 Steam Generator Feedwater Supply Check</li> <li>#34 Steam Generator Feedwater Supply Check</li> <li>ply main feedwater to the S/Gs.</li> <li>ans to prevent backflow from the S/G's into the feedwater system while the ps are not operating.</li> </ul>

## **Cold Shutdown Justifications**

#### <u>CSJ-13</u>

System:	FW		
Drawing:	ISI-20193		
Components:	BFD-67 BFD-68 BFD-69 BFD-70	Aux. Feed Pump Discharge To #32 Steam Generator Check Aux. Feed Pump Discharge To #31 Steam Generator Check Aux. Feed Pump Discharge To #33 Steam Generator Check Aux. Feed Pump Discharge To #34 Steam Generator Check	
Normal Function	whenever a negative pr	provide passive means to isolate nonoperating sections of the system ressure gradient exists across the valve. In addition, the check valves shall when a positive pressure gradient is present.	
Safety Function:	whenever a negative pr	provide passive means to isolate nonoperating sections of the system essure gradient exists across the valve. In addition, the check valves shall 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.		
		<u>CSJ-14</u>	
		(Augmented)	
System:	FW		
Drawing:	ISI-20193		
Components:	FCV-427 FCV-437	<ul> <li>#31 Steam Generator Main Feedwater Control</li> <li>#32 Steam Generator Main Feedwater Control</li> <li>#33 Steam Generator Main Feedwater Control</li> <li>#34 Steam Generator Main Feedwater Control</li> </ul>	
<b>Normal Function</b>	Operate in conjunction	with the MBFP speed control system to maintain S/G levels	
Safety Function:	Closes automatically to	Closes automatically to mitigate certain accidents.	
Testing Requirement:	A-EC, A-FST-C		
CS Justification:	During normal power of Closure verification can required.	operations these valves are open to supply main feedwater to the S/Gs. n only be performed during a stroke test when main feedwater is not	

## **Cold Shutdown Justifications**

### <u>CSJ-15</u>

System:	SW	
Drawing:	ISI-20333	
Components:	SWN-1-1 SWN-1-2 SWN-1-3 SWN-1-4 SWN-1-5 SWN-1-6	<ul> <li>31 Service Water Pump Discharge Check</li> <li>32 Service Water Pump Discharge Check</li> <li>33 Service Water Pump Discharge Check</li> <li>34 Service Water Pump Discharge Check</li> <li>35 Service Water Pump Discharge Check</li> <li>36 Service Water Pump Discharge Check</li> </ul>
Normal Function		vide flowpaths from the respective pumps to the various service water s. Close to prevent backflow of service water through idle pumps and the headers.
Safety Function:	Open to provide flowp heat loads.	paths from the respective pumps to the various service water headers and
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.	
	X	<u>CSJ-16</u>
System:	SW	
Drawing:	ISI-20333	
Components:	SWN-100-1 SWN-100-2	34, 35, &36 Service Water Pump Header to Nuclear Services 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:	and probably the oper evolution during plan	est of these valves requires a major realignment of the service water system ration of three service water pumps in each train. Performing such an it operation would constitute an unreasonable burden on the plant staff and ing the thermal equilibrium of operating equipment.

## **Cold Shutdown Justifications**

### <u>CSJ-17</u>

System:	RHR	
Drawing:	ISI-27203	
Components:	730 731	RHR Supply from RCS RHR Supply from RCS
Normal Function		ressure boundary between the RCS and RHR systems whenever RCS ture is above the RHR system design conditions.
Safety Function:	and temperature is ab	essure boundary between the RCS and RHR systems whenever RCS pressure ove the RHR system design conditions. Open to provide flowpaths for suctions of the RHR pumps to effect shutdown cooling recirculation from heat exchangers.
Testing Requirement:	EO, A-EC	
CS Justification:	These valves are elect and will automatically	rically interlocked to prevent opening at reactor pressures above 450 psig close if system pressure exceeds 550 psig.
		<u>CSJ-18</u>
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:		

## **Cold Shutdown Justifications**

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## <u>CSJ-19</u>

System:	SI	
Drawing:	ISI-27353	
Components:	838ARHR Return Low Head Injection Loop 1838BRHR Return Low Head Injection Loop 2838CRHR Return Low Head Injection Loop 3838DRHR 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.	
	<u>CSJ-20</u>	
System:	SI	
Drawing:	ISI-27353	
Components:	838ARHR Return Low Head Injection Loop 1838BRHR Return Low Head Injection Loop 2838CRHR Return Low Head Injection Loop 3838DRHR 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.	

## Cold Shutdown Justifications <u>CSJ-21</u>

System:	SI	
Drawing:	ISI-27353	
Components:	856B 856G	High Head Safety Injection to Loop #3 Hot Leg NonBIT Header 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 flow Closed during cold le	wpath from the SIS pumps to the RCS hot leg during hot leg injection.
<b>Testing Requirement:</b>	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.	
		<u>CSJ-22</u>
System:	SI	
Drawing:	ISI-27353	
Components:	856C 856E 856H 856J	High Head Boron Injection to Loop #4 Cold Leg BIT Header Stop High Head Boron Injection to Loop #1 Cold Leg BIT Header Stop High Head Safety Injection to Loop #3 Cold Leg NonBIT Header Stop 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.	
<b>Testing Requirement:</b>	EO, EC	
CS Justification:	These valves are pres During plant operatio containment.	et for throttling and require resetting following any stroking operation. on this is impractical and undesirable due to the location of the valves inside

# **Cold Shutdown Justifications**

#### <u>CSJ-23</u>

System:	SI	
Drawing:	ISI-27353	
Components:	894A 894B 894C 894D	<ul> <li>31 SIS Accumulator Discharge Valve</li> <li>32 SIS Accumulator Discharge Valve</li> <li>33 SIS Accumulator Discharge Valve</li> <li>34 SIS Accumulator Discharge Valve</li> </ul>
Normal Function	Open and de-energiz the RCS cold legs.	ed during operation to provide flowpaths from the respective accumulators to
Safety Function:	Open to allow accumulator flow to be delivered to the RCS SI actuation when RCS pressure drops below the accumulator operating pressure. Closed to isolate the accumulators and prevent possible gas binding of the steam generators and RHR pumps.	
<b>Testing Requirement:</b>	EC	
CS Justification:	During plant operation per Technical Specifi a plant shutdown wou	on these valves must be maintained open with their operators de-energized cation 3.3.A.3.c. If a valve were to fail to reopen in the course of exercising, and be required.
		<u>CSJ-24</u>
System:	SI	
Drawing:	ISI-27353	
Components:	895A 895B 895C 895D	<ul> <li>31 SIS Accumulator Discharge Valve</li> <li>32 SIS Accumulator Discharge Valve</li> <li>33 SIS Accumulator Discharge Valve</li> <li>34 SIS Accumulator Discharge Valve</li> </ul>
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:	coolant system. This	es to the open position requires overcoming the pressure of the reactor cannot be done during normal plant operation since the maximum is considerably less than that of the reactor coolant system.

## Cold Shutdown Justifications <u>CSJ-25</u>

System:	SI	
Drawing:	ISI-27353	
Components:	895A 895B 895C 895D	<ul> <li>31 SIS Accumulator Discharge Valve</li> <li>32 SIS Accumulator Discharge Valve</li> <li>33 SIS Accumulator Discharge Valve</li> <li>34 SIS Accumulator Discharge Valve</li> </ul>
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:	interface whenever R backleakage to the ac	Ill provide passive means to isolate the system/RCS pressure boundary CS pressure is at or above the system operating pressure and minimize RCS ccumulators to prevent dilution of the borated water contained in these tanks. If flow delivery to the RCS when RCS pressure is below system pressure.
<b>Testing Requirement:</b>	EC	
CS Justification:	The only positive me impractical during pl	ans of verifying valve closure is to perform a back leakage test, which is ant operation.
		<u>CSJ-26</u>
System:	SI	
Drawing:	ISI-27353	
Components:	897A 897B 897C 897D	High Head/Low Head to Loop #1 Cold Leg High Head/Low Head to Loop #2 Cold Leg High Head/Low Head to Loop #3 Cold Leg 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 me impractical during pl	ans of verifying valve closure is to perform a back leakage test, which is lant operation.

### Cold Shutdown Justifications <u>CSJ-27</u>

System:	CVCS	
Drawing:	ISI-27363	
Components:	201 202	Letdown Containment Isolation Letdown Containment Isolation
Normal Function	Normally open to pro flow.	vide a pathway from the RCS to the CVCS for normal letdown and charging
Safety Function:	Close for containmen	t 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.	
		<u>CSJ-28</u>
Saunda and		
System:	CVCS	
System: Drawing:	CVCS ISI-27363	
		Charging Containment Isolation Charging Containment Isolation
Drawing:	ISI-27363 205 226	
Drawing: Components:	ISI-27363 205 226 Normally open to prov	Charging Containment Isolation vide a pathway from the RCS to the CVCS for normal letdown and charging
Drawing: Components: Normal Function	ISI-27363 205 226 Normally open to prov flow.	Charging Containment Isolation vide a pathway from the RCS to the CVCS for normal letdown and charging

**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.



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## **Cold Shutdown Justifications**

# CSJ-29

#### (Augmented)

System:	CVCS	
Drawing:	ISI-27363	
Components:	204A 204B	Charging Line Loop 1 Cold Leg Isolation Charging Line Loop 2 Hot Leg Isolation
<b>Normal Function</b>	Normally one valve is	open and one valve is closed.
Safety Function:	These valves open to pumps to two RCS loc	provide charging and emergency boration flowpaths from the charging ops.
Testing Requirement:	A-EO, A-FST-O	
CS Justification:	opening of the A valve	hally aligned with the "A" valve closed and the "B" valve open. Routine e would subject the associated charging line piping to unnecessary thermal ial for damage to the piping.
		<u>CSJ-30</u>
System:	CVCS	
Drawing:	ISI-27363	
Components:	210A 210C	Charging Line Loop 2 Hot Leg Check Charging Line Loop 2 Hot Leg Check
Normal Function		
Safety Function:	These valves open to p pumps to two RCS loo	provide charging and emergency boration flowpaths from the charging ops.
Testing Requirement:	EO	

**CS Justification:** Exercising these values requires that value 204A be opened to establish flow to RCS Loop 2. Routine opening of the A value would subject the associated charging line piping to unnecessary thermal cycling and the potential for damage to the piping.

## **Cold Shutdown Justifications**

### <u>CSJ-31</u>

System:	CVCS	
Drawing:	ISI-27363	
Components:	222 250A 250B 250C 250D 441 442 443 444	RCP Seal Water Return Isolation 31 RCP Seal Injection Containment Isolation 32 RCP Seal Injection Containment Isolation 33 RCP Seal Injection Containment Isolation 34 RCP Seal Injection Containment Isolation 31 RCP Seal Injection Containment Isolation 32 RCP Seal Injection Containment Isolation 33 RCP Seal Injection Containment Isolation 34 RCP Seal Injection Containment Isolation
Normal Function	Open to provide a pa leakoff, and cooling.	thway from the RCP seals to the CVCS system to allow for seal injection,
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.	
		<u>CSJ-32</u>
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.	

## **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.	
<u>CSJ-34</u>		
System:	CVCS	
Drawing:	ISI-27363	
Components:	LCV-112B Charging Pump Suction From Refueling Water Storage Tank	
Normal Function	Closed to prevent backflow from the charging pump suction header to the RWST during emergency boration.	
Safety Function:	Opens to allow the charging pumps to take suction directly from the refueling water storage tank.	
Testing Requirement:	EO	
CS Justification:	Exercising this valve would require drawing water from the Refueling Water Storage Tank (RWST). During plant operation, this would add negativity into the reactor core and result in undesirable reactor power and temperature transients.	

## **Cold Shutdown Justifications**

#### <u>CSJ-35</u> (Augmented)

System:	CVCS		
Drawing:	ISI-27363		
Components:	LCV-112C	Volume Control Tank Outlet Isolation Valve	
Normal Function		Open to provide a flowpath from the volume control tank to the charging pumps and maintains proper NPSH for the pumps.	
Safety Function:		Closes on low level in the volume control tank to prevent nitrogen gas from entering the suctions of the charging pumps.	
Testing Requirement:	A-EC		
CS Justification:	Exercising this valve would require drawing water from the Refueling Water Storage Tank (RWST). During plant operation, this would add negativity into the reactor core and result in undesirable reactor power and temperature transients. Additionally, this could cause a level and pressure transient in the Volume Control Tank (VCT), whereas, the VCT relief valve could be challenged.		
<u>CSJ-36</u>			
System:	CVCS		
Drawing:	ISI-27363		
Components:	LCV-459 LCV-460	Letdown Line Isolation Valve 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.		

## **Cold Shutdown Justifications**

#### <u>CSJ-37</u>

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System:	RCS	
Drawing:	ISI-27473	
Components:	652 653 654 655	RX Vessel Head Vent Valve RX Vessel Head Vent Valve RX Vessel Head Vent Valve 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.	
		<u>CSJ-38</u>
System:	RCS	
Drawing:	ISI-27473	
Components:	PCV-455C PCV-456	Power Operated Relief Valve Power Operated Relief Valve
Normal Function	Closed to maintain the RCS pressure boundary.	
Safety Function:	Protect the RCS from over-pressurization when the reactor vessel is cooled down (LTOP).	
Testing Requirement:	EO	
CS Instituation.	Should a DODU Gilt	- Anno - Constant in the state of the state

**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.



## **Cold Shutdown Justifications**

### <u>CSJ-39</u>

System:	SI	
Drawing:	ISI-27503	
Components:	842 843	Safety Injection Pump Miniflow Isolation Valve Safety Injection Pump Miniflow Isolation Valve
Normal Function	Open to provide mini	mum 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.	
<u>CSJ-40</u>		
System:	SI	
Drawing:	ISI-27503	
Components:	846	Refueling Water Storage Tank Isolation Valve
Normal Function	Open to provide a flow	wpath 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:		in open and de-energized during plant operation to ensure the operability of poling systems. Closing this valve renders all high head and low head safety erable.

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## **Cold Shutdown Justifications**

### <u>CSJ-41</u>

	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.	
			<u>CSJ-42</u>
)	System:	SI	
	Drawing:	ISI-27503	
	Components:	876A 876B	Spray Additive Tank Isolation Valve Spray Additive Tank Isolation Valve
	Normal Function	Closed. Precludes ina systems (RWST) with	dvertent contamination of the containment spray and safety injection 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.	



## **Cold Shutdown Justifications**

## <u>CSJ-43</u>

System:	SI		
Drawing:	ISI-27503		
Components:	882	RHR Pump Suction	
Normal Function	Open to provide a flowp pumps for low pressure	bath from the refueling water storage tank to the suction of the RHR 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.		
		<u>CSJ-44</u>	
System:	SI		
Drawing:	ISI-27503		
Components:	883 F	RHR Pump Discharge to SIS Isolation Valve	
Normal Function	Closed with power remo function of the RHR pur	wed from its operator to prevent opening and defeating the safety injection nps.	
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 Technical Specification	n power removed from its operator during plant operation as required by 3.3.A.3.1.	



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## **Cold Shutdown Justifications**

#### <u>CSJ-45</u>

System:	SI	
Drawing:	ISI-27503	
Components:	885A 885B	Containment Sump RHR Suction Isolation Valve Containment Sump RHR Suction Isolation Valve
Normal Function	Closed for containment isolation and to provide isolation to prevent the accidental draining of the RCS or RWST to the containment sump.	
Safety Function:	Opened to align the RHR pumps to take suction from the containment sump for post-accident long-term recirculation as a backup for the recirculation pumps.	
Testing Requirement:	EO, EC	
CS Justification:	These two valves are in series and valve 885A is inside minicontainment and thus inaccessible during operation. Opening these valves could result in inadvertent draining of the RWST to the containment sump. During power operation this would be an unacceptable transient.	
		<u>CSJ-46</u>
System:	SI	
Drawing:	ISI-27503	
Components:	888A 888B	Low Head to High Head SI Recirculation Stop Valve 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.	

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## **Cold Shutdown Justifications**

## <u>CSJ-47</u>

System:	SI	
Drawing:	ISI-27503	
Components:	1810	Refueling Water Storage Tank Outlet Isolation Valve
Normal Function	Open to permit SI pu	mps to draw suction from the RWST.
Safety Function:		wpath from the refueling water storage tank to the SIS pumps, and close to gh 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.	
<u>CSJ-48</u>		
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.	
<b>Testing Requirement:</b>	EO	
CS Justification:	The system lineup and defeating the spray ac	d preparations required for opening either of these valves would require distive feature of the containment spray system.

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## **Cold Shutdown Justifications**

#### <u>CSJ-49</u>

System:	RHR	
Drawing:	ISI-27513	
Components:	738A 738B	RHR Pump Discharge Check Valve 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.	
		<u>CSJ-50</u>
System:	RHR	
Drawing:	ISI-27513	
<b>Components:</b>		
	743	RHR Pump Recirculation Line Isolation Valve
Normal Function		wpath for RHR pump minimum flow to afford pump protection when a
-	Open to provide a flor pump is operating at o During an accident sco	wpath for RHR pump minimum flow to afford pump protection when a
Normal Function	Open to provide a flor pump is operating at o During an accident sco	wpath for RHR pump minimum flow to afford pump protection when a r near shutoff head.



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# **Cold Shutdown Justifications**

### <u>CSJ-51</u>

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.	
<u>CSJ-52</u>		
System:	CCW	
Drawing:	ISI-27513	
Components:	756A 756B	Charging Pump CCW Supply Isolation Charging Pump CCW Return Isolation
<b>Normal Function</b>	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).	



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## **Cold Shutdown Justifications**

## <u>CSJ-53</u>

System:	CCW	
Drawing:	ISI-27513	· · · ·
Components:	769 797	RCP Seal & Bearing Coolers & Vessel Cooling Support Block CCW Supply Isolation RCP Seal & Bearing Coolers & Vessel Cooling Support Block CCW Supply Isolation
Normal Function	Open to provide a flo	wheth for cooling water to the reactor coolant pumps.
Safety Function:	Containment isolation values 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.	
		<u>CSJ-54</u>
System:	CCW	
Drawing:	ISI-27513	
Components:	784	RCP Bearing Coolers & Vessel Cooling Support Block CCW Return
	786	Isolation 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.	



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## **Cold Shutdown Justifications**

### <u>CSJ-55</u>

System:	CCW			
Drawing:	ISI-27513			
Components:	789 FCV-625	RCP Seal CCW Return Isolation 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 values during plant operation would disrupt cooling to the reactor coolant pumps with the potential for damaging the pumps due to overheating.			
<u>CSJ-56</u>				
System:	CCW			
Drawing:	ISI-27513			
Components:	810 814	Non Regenerative Heat Exchanger Cooling Water Supply/Return Isolation 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.			
<b>Testing Requirement:</b>	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.			

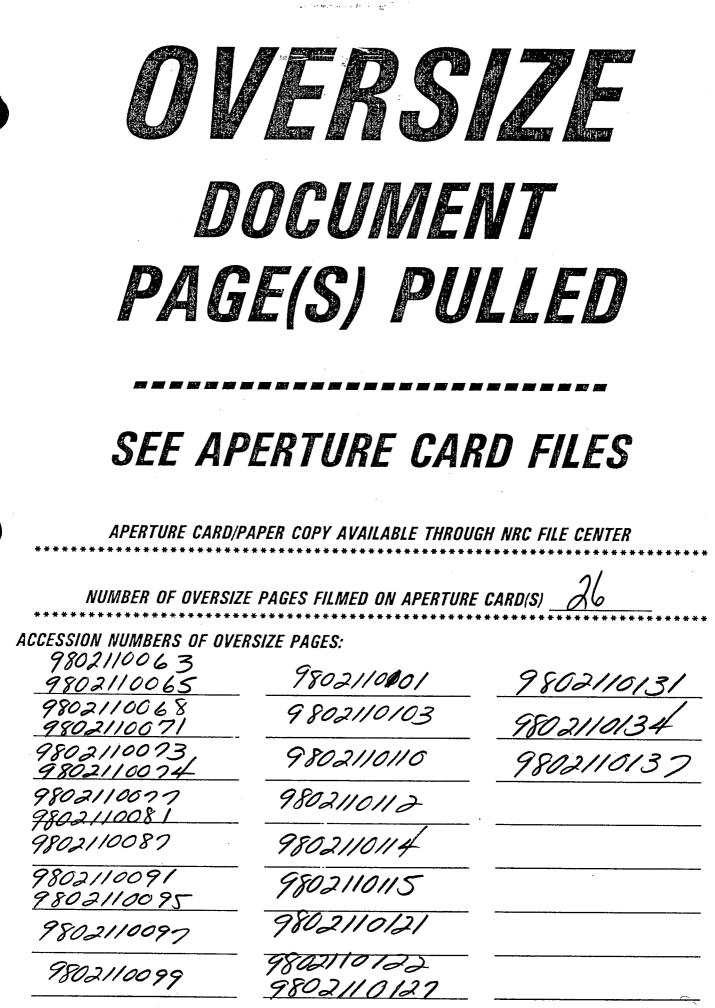
# **Cold Shutdown Justifications**

#### <u>CSJ-57</u>

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.			
<u>CSJ-58</u>				
System:	HVAC			
Drawing:	ISI-40223			
Components:	FCV-1170 FCV-1171 FCV-1172 FCV-1173	Containment Building Purge Inside Supply Valve Containment Building Purge Outside Supply Valve Containment Building Purge Outside Supply Valve 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.			

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