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December 6, 2002

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

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No. 50-293
License No. DPR-35

Pilgrim Nuclear Power Station Fourth Ten-Year Inserveice Testing (IST) Program and Request for Approval of IST Relief Requests

LETTER NUMBER: 2.02.109

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. (Entergy) has revised the Pilgrim Nuclear Power Station (PNPS) Inservice Testing (IST) Program as required by 10CFR50.55a(f)(4)(ii) for the fourth 10-year interval starting December 7, 2002.

This submittal dockets Pilgrim IST program, Procedure No. 8.I.1.1. and requests NRC approval of IST relief requests, as described in this letter.

The revised IST Program complies with 1995 Edition through 1996 Addenda of the OM Code for Operation and Maintenance of Nuclear Power Plants, Section IST requirements with a few exceptions. These exceptions invoke 10CFR50.55a(f)(4)(iv), the use of portions of later approved ASME OM Code editions and 10CFR50.55a(f)(5)(iii) the notification that conformance with certain code requirements are impractical.

The NRC has recently approved 1998 Edition through 2000 Addenda of the OM Code for Operation and Maintenance of Nuclear Power Plants, (OMb Code - 2000). The following portions of the OMb Code - 2000 will be adopted into the revised IST Program (There are no other related requirements within the OMb Code – 2000 for these paragraphs):

- Appendix I-1390, Test Frequency, Class 2 and Class 3 Pressure Relief Devices that are Used for Thermal Relief Application.
- Appendix I-4110(h) and Appendix I-4130(g), Pressure Relief Devices - a minimum of 5-minute time elapse between successive openings.
- Deletion ISTA 2.1, Inspection – Duties of Inspector, Inspector Qualifications, and Access for Inspector.

A summary table of the IST Program Relief Requests requested for approval is enclosed (Attachment 1). This summary table provides a brief description of the impracticality or hardship requiring relief. The updated program Valve Relief Request No. 1 (VR-01) and No. 2 (VR-02) were recently reviewed and granted for ten years in a NRC Safety Evaluation Report (SER) dated September 17, 2002 and May 2, 2001, respectively.

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The details of the relief requests are specified in the IST Program Section 7.0 (Attachment 2) as pump and valve relief requests. A relief is requested where PNPS determined a non-conformance to certain Code requirement(s). The relief request provides either an alternative of acceptable level of quality and safety, an alternative since a hardship exists without a compensating increase in the level of quality and safety, or an alternative because it is an impractical requirement for the facility to meet.

PNPS has developed the following schedule plan for implementation of the updated program surveillance requirements:

Subsection ISTB, Inservice Testing of Pumps, will be implemented three months from December 7, 2002, with the exception of Reactor Building Closed Cooling Water (RBCCW) and High Pressure Coolant Injection (HPCI) pump testing, which will be implemented upon receipt of NRC approval of the pump relief requests. Until then Pilgrim will continue to comply with the third 10-year IST Interval program requirements for RBCCW and HPCI pumps.

Implementation of Subsection ISTC, Inservice Testing of Valves, will begin three months from December 7, 2002.

Entergy requests timely NRC review and approval of IST Relief Requests in order to support implementation of the new program.

If you have any questions or require additional information, please contact Mr. Bryan Ford, Licensing Manager, at (508) 830-8403.

Sincerely,

W.J. Riggs

Attachments: 1. Relief Request Summary Table – 1 page
2. Procedure No. 8.I.1.1, "Inservice Pump and Valve Testing Program" – 178 pages

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ATTACHMENT 1

RELIEF REQUEST SUMMARY TABLE

Relief No.	Description
PR-01	Obtain test parameter values with two Reactor Building Closed Cooling Water Pumps running in parallel, when plant-operating conditions prohibit single pump operation.
PR-02	Test the High Pressure Coolant Injection turbine driven booster and main pumps as an integral unit when satisfying OM Code testing requirements
PR-03	Expand the Vibration Acceptable and Alert Ranges for the High Pressure Coolant Injection pumps as historical and current data identify the reference value being high when the pump is known to be operating acceptably.
PR-04	Exceed the vibration frequency response range for measuring equipment when measuring Standby Liquid Control pumps vibration due to this positive displacement pump low nominal shaft rotational speed.
VR-01	Recently approved by SER dated September 17, 2002. Modified to identify applicable test requirements of OM Code vs. OM Parts 6 and 10.
VR-02	Recently approved by SER dated May 2, 2001. Modified to identify applicable test requirements of OM Code vs. OM Parts 6 and 10.
VR-03	Perform leakage rate testing of Category A and AC valves, other than Containment and Pressure Isolation Valves, as part of an IST Performance-Based Testing (PBT) Program in lieu of OM Code 2-year test frequency.
VR-04	Perform Post Work Testing (PWT) position indication verification, only in lieu of performing routinely scheduled (2-year) verifications.
VR-05	Establish stroke time acceptance limits for Main Steam Isolation Valve using PNPS Technical Specification acceptance criteria in lieu of OM Code for other power-operated valves (i.e., reference stroke time of less than or equal to 10 seconds).
VR-06	Perform leakage rate testing of Category A and AC Pressure Isolation Valves, as part of a PIV Performance-Based Testing (PBT) Program in lieu of OM Code 2-year test frequency.

ATTACHMENT 2

PROCEDURE NO. 8.I.1.1,

INSERVICE PUMP AND VALVE TESTING PROGRAM

RTYPE H6.08

PILGRIM NUCLEAR POWER STATION

Procedure No. 8.I.1.1

INSERVICE PUMP AND VALVE TESTING PROGRAM

STAR

Stop
Think
Act
Review

IST RELATED

REVISION LOG

REVISION 15 **Date Originated 5/02**

Pages affected	Description
All	The Inservice Pump and Valve Testing Program is being upgraded in accordance with 10CFR50.55a(f)(4)(ii) which requires compliance with the latest approved Code incorporated within 10CFR50.55a(b). The Code of record and that which is adopted for this upgrade is ASME OM, Code For Operation And Maintenance of Nuclear Power Plants, 1995 Edition through 1996 Addenda.

In addition to the Code upgrade, this program revision clarifies 10CFR50.55a(f)(1) such that the component scope includes those pumps and valves which are part of the Reactor coolant boundary, thus meeting the applicable requirements of ASME Code Class 1. Also included are other pumps and valves that perform a function to shut down the Reactor or maintain the Reactor in a safe shutdown condition, mitigate the consequences of an accident, or provide overpressure protection for safety-related systems and must meet the test requirements applicable to components which are classified as ASME Code Class 2 or Class 3. This distinction is of importance since numerous components not being assigned as ASME Code Class 1, 2, or 3 will no longer be tested as part of the IST Program. These safety-related components not being designated ASME Class 1, 2, or 3 will become part of the new Appendix B Pump and Valve Testing (ABT) Program.

A new program is being established for check valve condition monitoring The Condition Monitoring Program is an alternative to the testing or examination requirements of Paragraphs ISTC 4.5.1 through ISTC 4.5.4.

Finally, this upgrade requires major modification in Code Justifications and the creation of new Code Relief Requests. A Code Justification explains how compliance to Code allowed deviations are satisfied and does not require Commission approval. The new justifications take the format of cold shutdown (CS), Refueling Outage (RJ), Disassembly (DJ), and Series Pair (SJ) for valve and pressure relief devices. The new Code Relief Requests are to identify noncompliance with OMa Code requirements and must receive Commission approval prior to implementation.

The entire document was revised; therefore, no revision bars are shown.

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1.0 PURPOSE AND SCOPE

This Procedure encompasses and controls the PNPS Inservice Testing (IST) Program. It identifies the scope of components (pumps and valves) and testing requirements for compliance with 10CFR50.55a(f), Inservice Testing Requirements. This Procedure will be utilized for the IST Program submittal to satisfy ISTA 2.2.3 Inservice Test Interval and to identify impractical Code requirements in accordance with 10CFR50.55a(f)(5).

Impractical Code requirements are reviewed and dispositioned by the Nuclear Regulatory Commission (NRC) and documented in a Safety Evaluation Report authored by the Office of Nuclear Reactor Regulation as related to the Inservice Testing Program and Requests for Relief The NRC will grant program relief requests pursuant to 10CFR50.55a(a)(3)(i), 10CFR50 55a(a)(3)(ii), or 10CFR50.55a(f)(6)(i). Granting of relief ensures that the IST Program has satisfactorily demonstrated that either: 1) the proposed alternative provides an acceptable level of quality and safety, 2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or 3) conformance with certain requirements of the applicable Code edition and addenda is impractical for its facility.

2.0 DISCUSSION

The scope of the IST Program includes those safety-related pumps and valves which are part of the Reactor coolant pressure boundary and must meet the requirements applicable to components classified as ASME Code Class 1. Additionally, other safety-related pumps and valves that perform a function to shut down the Reactor or maintain the Reactor in a safe shutdown condition, mitigate the consequences of an accident, or provide overpressure protection for safety-related systems meet the test requirements applicable to components which are classified as ASME Code Class 2 or Class 3. This scope is limited to those pumps and valves identified as meeting ASME Code Class 1, 2, or 3 in accordance with Regulatory Guide 1.26 classifications. The pumps and valves not performing a function as stated above or those meeting the exclusion requirements of the OMa Code need not be tested, but the bases for a component's exclusion must be justified. TDBD-121, "Topical Design Basis Document for In-Service Testing (IST)", provides the bases information related to IST Program exclusions.

Non-ASME Code Class safety-related pumps and valves that perform a function to shut down the Reactor or maintain the Reactor in a safe shutdown condition, mitigate the consequences of an accident, or provide overpressure protection for safety-related systems are to be tested under the requirements of 10CFR50 Appendix B. The scope of the PNPS Appendix B Test Program includes those safety-related pumps and valves identified as non-ASME Code Class in accordance with Regulatory Guide 1.26 but would be considered ASME Code Class 1, 2, 3.

This Procedure details the following items: compliance requirements, general information, pump hydraulic circuits, and tables of the components (pumps and valves) tested. The last Section (7.0) contains Valve Justifications (i.e., cold shutdown, Refuel Outage, Disassembly Examination, and Series Valve Pairs) and Relief Requests. In addition, the Procedure references the Condition Monitoring Program for check valves.

The Procedure's pump and valve tables provide a cross-reference between a component test requirement and a Station Procedure implementing the test. Additional information is provided within this component listing: safety class, category, test frequency, test parameters, Relief Requests, justifications, and remarks. Newly incorporated component/test requirements will have implementing Procedures identified for future incorporation. All newly identified component/test requirements shall be initially tested during the next scheduled frequency (i.e., quarterly, cold shutdown, refueling interval, and 2 years) following Procedure approval date. These newly incorporated component/test requirements will be identified by an asterisk (*) next to the implementing Procedure. When using (*) Procedures for postmaintenance testing, the current approved Procedure should be reviewed for applicability (i e , is the new test requirement or component incorporated)

PNPS 8.I.1, *"Administration of Inservice Pump and Valve Testing"*, covers the administrative requirements for the development, performance, and maintenance of the PNPS Inservice Test Program in accordance with the ASME OMa Code for Operation and Maintenance of Nuclear Power Plants, and includes the 1995 Edition through 1996 Addenda.

Station ALARA practices have been considered when addressing ASME Code test requirements within this Procedure. When test requirements are added or revised, good ALARA practices should be incorporated to minimize personnel dose.

3.0 REFERENCES

[1] 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

[2] 10CFR50 Appendix J, Primary Reactor Containment Leakage Testing

[3] 10CFR50.55a(b), Code and Standards, Reference Applicability

[4] 10CFR50.55a(f), Inservice Testing Requirements

[5] ASME Code, Mandatory Appendix I, Inservice Testing of Pressure Relief Device in Light-Water Reactor Power Plants

[6] ASME Code, Subsection ISTA, General Requirements

[7] ASME Code, Subsection ISTB, Inservice Testing of Pumps in Light-Water Reactor Power Plants

[8] ASME Code, Subsection ISTC, Inservice Testing of Valves in Light-Water Reactor Power Plants

[9] ASME Code for Operation and Maintenance of Nuclear Power Plants, Section IST (Rules for Inservice Testing of Light-Water Reactor Power Plants), 1996 Addenda, Subsections ISTA, ISTB, and ISTC

[10] ESR Response Memo ERM-90-578

[11] IEN 88-70, "Check Valve Inservice Testing Program Deficiencies"

[12] NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation"

[13] NRC Generic Letter 87-06, "Periodic Verification of Leak Tight Integrity of Pressure Isolation Valves"

[14] NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"

[15] NRC Publications, "Minutes of the Public Meetings on Generic Letter 89-04", dated October 25, 1989

[16] NRC Regulatory Guide 1 26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants"

[17] NUREG-0800, Standard Review Plan 3.2.2, "System Quality Group Classification"

[18] NUREG-0800, Standard Review Plan 3.9.6, "Inservice Testing of Pumps and Valves"

[19] NUREG-0800, Standard Review Plan 6.2.4, "Containment Isolation System"

[20] NUREG 1352, "Action Plans for Motor-Operated Valves and Check Valves"

[21] NUREG 1482, "Guidelines for Inservice Testing at Nuclear Power Plants", dated April, 1995

[22] Procedures

(a) NOP92M2, *"ASME Section XI Inservice Inspection and Testing"*

(b) PNPS 8.I.1, *"Administration of Inservice Pump and Valve Testing"*

(c) PNPS 8.I.1 2, *"Appendix B Pump and Valve Testing Program"*

(d) PNPS 8 I 27, *"Inservice Check Valve Sample Disassembly and Exercise Program"*

(e) PNPS 8.I.37, *"Inservice Check Valve Nonintrusive Testing for Exercise Program"*

[23] PNPS "Q"-List

[24] PR98.9525.01, Engineering Action Item Response

[25] Summary of NRC Workshops held in NRC Regions on Inspection Procedure 73756, dated July 18, 1997

[26] TDBD-121, "Topical Design Basis Document for In-Service Testing (IST)"

4.0 COMPLIANCE

This Inservice Pump and Valve Testing Program will be in effect through the fourth 120-month test interval (ending December 7, 2012) and will be updated in accordance with the requirements of ISTA 2.2.3(c)(2) and 10CFR50 55a(f)(4)(ii).

This Procedure outlines the PNPS IST Program based on the requirements of the ASME OM Code for Operation and Maintenance of Nuclear Power Plants, 1995 Edition through the 1996 Addenda subject to the following limitations and modifications specified in 10CFR50.55a(b)(3):

[1] *Appendix II* The following modifications apply when implementing Appendix II, "Check Valve Condition Monitoring Program," of the OM Code, 1995 Edition with the 1996 Addenda."

(a) "Valve opening and closing functions must be demonstrated when flow testing or examination methods (nonintrusive, or disassembly and inspection) are used;"

(b) "The initial interval for tests and associated examinations may not exceed two fuel cycles or 3 years, whichever is longer; any extension of this interval may not exceed one fuel cycle per extension with the maximum interval not to exceed 10 years; trending and evaluation of existing data must be to reduce or extend the time interval between tests."

(c) "If the Appendix II condition monitoring program is discontinued, then the requirements of ISTC 4.5.1 through 4 5 4 must be implemented."

The Inservice Testing Program is invoking 10CFR50.55a(f)(iv), the use of portions of later approved ASME Code editions The recent approval of the 1998 Edition through 2000 Addenda of the OM Code, Section IST into the federal regulations allows for use of the following:

- Appendix I-1390, Test Frequency, Class 2 and Class 3 Pressure Relief Devices That Are Used For Thermal Relief Application

- Appendix I-4100(h) and Appendix I-4130(g), Allow Pressure Relief Devices a Minimum of 5 Minute Elapse Time Between Successive Openings

- Deletion of ISTA 2.1, Inspections that Include Duties of Inspectors, Inspector Qualification, and Access for Inspector

10CFR50.55a(f)(1) provides guidance for inclusion of ASME Code 1, 2, and 3 components into the IST Program. The guideline states that "pumps and valves which are part of the Reactor coolant pressure boundary must meet the requirements applicable to components which are classified as ASME Code Class 1. Other safety related pumps and valves [that perform a function to shut down the Reactor or maintain the Reactor in a safe shutdown condition, mitigate the consequences of an accident, or provide overpressure protection for safety-related systems - in or when meeting the requirements of the OM Code, or later] must meet the test requirements applicable to components which are classified as ASME Code Class 2 or Class 3". ASME safety related components that apply to IST are those pumps and valves included within the scope of Regulatory Guide 1.26.

The IST Program has incorporated a Condition Monitoring Program which establishes as an alternative to the test or examination requirements (ISTC 4.5 1 through ISTC 4 5 4) for a check valve or check valve group

If this Procedure conflicts with PNPS Technical Specifications, a Technical Specifications amendment shall be submitted to conform the Technical Specifications to this Procedure in accordance with 10CFR50.55a(f)(5)(ii) Until approval of the Technical Specifications amendment, the most limiting requirement shall be met.

5.0 INSERVICE PUMP TESTING

5.1 GENERAL INFORMATION

[1] Applicable Code

This Inservice Testing Program addresses those ASME Code Class 1, 2, and 3 centrifugal and positive displacement pumps that meet the requirements of Subsection ISTB of ASME OMa Code 1995 Edition through Addenda 1996 The applicability of the subsection establishes the requirements for preservice and inservice testing to assess the pump's operational readiness. The pumps covered are those provided with an emergency power source and that are required in shutting down a Reactor to the safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident The following pump exclusions exist: drivers (except where the pump and driver form an integral unit and the pump bearings are in the driver), pumps that are supplied with emergency power solely for operating convenience and skid-mounted pumps that are tested as part of the major component. The skid-mounted pumps are excluded when they have been determined by the owner to be adequately tested (Reference: TDBD-121, Topical Design Basis Document for In-Service Testing).

Where the above requirements for ASME Class 1, 2, or 3 pumps are determined to be impractical, requests for relief have been written and are included in Section 7 0 as follows.

(a) RELIEF REQUEST (PR-XX) - Relief Requests are included in Section 7 1 and identify those impractical test requirements. A Relief Request must be reviewed and approved by the NRC prior to use.

[2] Pump Program Table Description

The table in Section 5.3 lists all pumps included in the Pilgrim Nuclear Power Station (PNPS) IST Program. This program defines pumps as mechanical devices used to move liquid. The program addresses centrifugal and positive displacement pumps according to ISTB 1.1, Applicability. Skid-mounted pumps have been identified for information but excluded from inservice testing. The column headings of the table are listed and explained below:

(a) SYSTEM: System Title

(b) PUMP No.: Pump Identification Number

(c) IST CLASS: IST Classification (Class 1, 2, or 3)

(d) P&ID/COORD.: PNPS drawing number and coordinate location

(e) PUMP TYPE A or B: Pump type as specified in OMa-1996 Section ISTB

(f) TEST A OR B (FREQ.) AND COMPREHENSIVE PROC. (FREQ.). The PNPS test Procedure number and frequency of inservice tests as prescribed in ISTB Table 5 1-1, Inservice Test Frequency

(g) TEST QUANTITIES (SPEED, PRESS, FLOW, AND VIB): Inservice test quantities to be measured following the guidelines of ISTB Table 4.1-1, Inservice Test Parameters

[3] "Inservice Test Quantities"

PUMP SPEED (N), DISCHARGE PRESSURE (Pd) or DIFFERENTIAL PRESSURE (DP), FLOW RATE (Q), VIBRATION (V): When the symbol "Y" appears in a particular measured parameter column, that quantity will be measured during inservice testing in accordance with Subsection ISTB.

[4] Measurement of Inservice Test Quantities

(a) Speed (N): In accordance with Table ISTB 4.1-1, Inservice Test Parameters, shaft measurements are not applicable (NA) for pumps coupled to synchronous or induction type drivers, but only if variable speed For variable speed pumps, the pump speed shall be set at the reference speed in accordance with ISTB 4.7 1 and 4 7 3.

(b) Discharge Pressure (Pd): For positive displacement pumps, discharge pressure will be measured in lieu of differential pressure in accordance with Table ISTB 4.1-1 (all other pumps will have discharge pressure measured if it is needed to determine differential pressure)

(c) Differential Pressure (DP) Differential pressure measurements will be calculated from inlet and discharge pressure measurements or by direct differential pressure measurement The differential pressure will be measured for centrifugal pumps, including vertical line shaft pumps, in accordance with Table ISTB 4.1-1. The Service Water Pumps are an exception because the individual SSW pump suction is not configured to obtain pump suction pressure. This parameter is determined by analytical method using suction bay level instruments and is then converted to the equivalent suction pressure The analytical method has been determined to meet the required instrument accuracy (± 1/2%) of Table ISTB 4 7.1-1 in accordance with ISTB 4.7.1(a).

(d) Vibration (V): Pump vibration will be measured on centrifugal, vertical line shaft, and reciprocating pumps. On centrifugal pumps, measurements shall be taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump-bearing housing and on the axial direction on each accessible pump thrust bearing housing. On vertical line shaft pumps, measurements shall be taken on the upper motor-bearing housing in three approximately orthogonal directions, one being the axial direction. On reciprocating pumps, measurements shall be taken on the bearing housing of the crankshaft, approximately perpendicular to both the crankshaft and the line of plunger travel.

[5] Allowable Ranges of Test Quantities

The allowable ranges specified in Table ISTB 5.2.1-1 and Figure ISTB 5.2-1 will be used for vibration measurements for Group A and Comprehensive Tests. The allowable ranges specified in Table ISTB 5.2 1-2, Table ISTB 5 2 2.-1, and Table ISTB 5.2.3-1 will be used for discharge pressure, differential pressure, and flow measurements for Group A, Group B, and Comprehensive Tests, respectively.

[6] Corrective Action

The operational readiness of a pump shall be determined by comparing Surveillance Procedure test results to the established Acceptable, Alert, and Required Action Ranges.

(a) If deviations fall within the Alert Range of Table ISTB 5.2.1-1, Table ISTB 5.2.1-2, Figure ISTB 5 2-1, or Table ISTB 5.2 3-1, as applicable, the frequency of testing shall be doubled until the cause of the deviation is determined and the condition corrected.

(b) If deviations fall within the Required Action Range of Table ISTB 5.2.1-1, Table ISTB 5.2.1-2, Figure ISTB 5.2-1, or Table ISTB 5 2.3-1, as applicable, the pump shall immediately be declared inoperative and not returned to service until the cause of the deviation has been determined and the condition corrected, or an evaluation is performed and new reference values are established.

(c) When a test shows a systematic error (improper system lineup or inaccurate instrumentation) such that a measured parameter value(s) falls outside the Acceptable Range, the test shall be rerun after correcting the error.

[7] Instrument Accuracy

Instrument accuracy is defined as the allowable inaccuracy of an instrument loop (i.e., two or more instruments or components working together to provide a single output) based on the square root of the sum of the square of the inaccuracies of each instrument or component in the loop when considered separately. Alternatively, the allowable inaccuracy of the instrument loop may be based on the output for a known input into the instrument loop

Allowable instrument accuracies are provided in Table ISTB 4.7.1-1. If the accuracies of plant-installed instrumentation are not acceptable, temporary M&TE instruments meeting the acceptable accuracies will be used. For individual analog instruments, the required accuracy is a percent of full scale. For digital instruments, the required accuracy is over the calibrated range. For a combination of instruments, the required accuracy is loop accuracy.

Guidance provided within NUREG-1482 and the summary of public workshops held in NRC regions on Inspection Procedure 73756 will be used for meeting the OM Code instrument accuracy requirements.

In cases where a parameter is determined by analytical methods instead of being measured, the requirements of ISTB 4 7.1 must be adhered to.

[8] Excluded Safety Related Pumps

The Reactor recirculation pumps and the recirculation jet pumps are examples of pumps excluded from inservice testing Excluded pumps do not meet the applicability requirements of Subsection ISTB in that they are not required to perform a specific function in shutting down the Reactor to the safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident. Additionally, all pumps that meet the exclusion requirements of ISTB 1.2 will be identified within the bases document (TDBD-121).

[9] Skid-Mount Pumps

Skid-mounted pumps are defined as pumps that are integral to or that support operation of the major component, even though these pumps may not be located directly on the skid. Generally, the manufacturer of the major component supplies these pumps. Examples of systems having skids as a subassembly include High Pressure Coolant Injection System and Reactor Core Isolation Cooling System

ASME Code Class 1, 2, and 3 skid-mounted pumps that are tested as part of the major component are listed in both the IST Program and bases document. The IST basis documentation contains the specific details necessary to ensure pumps classified as skid-mounted are adequately tested.

[10] Test Requirements

Preservice and inservice test periods are used to establish the proper test method in the establishment of an initial set of reference values for a new pump The preservice test period is the time interval prior to or before implementing inservice testing (i e., the start of the pump's service life) The inservice testing shall commence when the pump is required to be operable and continue until the pump is retired (i.e., removed from service).

[11] Test Group

The IST Program centrifugal and positive displacement pumps are to be grouped by their inservice run time. Grouped as Type A or Type B, this allows for the development of unique test requirements due to the service the pump experiences as follows:

(a) Group A pumps are those operated continuously or routinely during normal operation, cold shutdown, or refueling operations.

(b) Group B pumps are those in standby systems that are not operated routinely except for testing.

[12] Test Methods

(a) Group A Test Method - shall be conducted with the pump operating at a specified reference point in accordance with ISTB 5.2.1. The test parameters shown in Table ISTB 4.1-1 shall be determined and recorded.

(b) Group B Test Method - shall be conducted with the pump operating at a specified reference point. Tests shall be conducted in accordance with ISTB 5.2.2. The test parameters shown in Table ISTB 4.1-1 shall be determined and recorded.

(c) Comprehensive Test Method - shall be conducted with the pump operating at a specified reference point. Tests shall be conducted in accordance with ISTB 5 2.3. The test parameters shown in Table ISTB 4.1-1 shall be determined and recorded.

(d) Preservice Test Method - shall be conducted under conditions as near as practicable to those expected during subsequent inservice testing in accordance with ISTB 4.1. This test establishes the initial set of reference values (typically following the completion of construction activities and before first electrical generation by nuclear heat) and only one preservice test is required for each pump. The test parameters to be measured are specified in Table ISTB 4 1-1.

[13] Test Frequency

(a) Quarterly - both Group A and B pump test procedures are to be tested within a 92-day interval with an allowable extension of no more than 25%.

(b) Biennially - pumps must be tested using the Comprehensive pump test procedure within a 2-year interval with an allowable extension of no more than 25%.

5.2 HYDRAULIC CIRCUITS

The following IST hydraulic circuits are used to identify pump test paths and instrumentation. Individual hydraulic and mechanical reference value test quantities are identified within each pump testing procedure.

M&TE instrumentation may be used in place of installed plant instruments provided that ISTB 4.7.1(c) requirements are satisfied. The effects of flow losses and elevation differences due to instrument location were considered

5.2.1 Salt Service Water (SSW) Pumps

[1] Test Group A - pumps operated continuously.

[2] Test/Frequency Method

SSW pumps are tested quarterly using the Group A Test Method and biennially using the Comprehensive Test Method.

[3] Hydraulic Test Path

Each pump will be tested by splitting the SSW loops and establishing single pump operation in the loop utilized for testing. Using the RBCCW and/or TBCCW Heat Exchanger Outlet Valves for throttling, establish a flow rate in accordance with current FSAR/Design Bases requirements Pump discharge pressure shall be recorded and, using suction bay level measurement, the pump differential pressure (i.e., total dynamic head) will be calculated and compared to the established reference values. The suction pressure (bay level measurement) is being determined by an analytical method instead of being measured. This method is in compliance to Table ISTB 4.7.1-1.

[4] Instrumentation

Inlet Pressure, P_I (ft) EPIC Computer Points CWS154 and CWS156 (LI-38010 and LI-38011, EPIC Points CWS010 and CWS012, or LI-3831A and B may be used as backup)

Discharge Pressure (psig): M&TE gauges at the locations of PI-3802, PI-3807, PI-3812, PI-3817, and PI-3822.

Flow rate Q (GPM): FE-38002A/FIY-38003A, FE-38002B/FIY-38003B.

5.2.2 Reactor Building Closed Cooling Water (RBCCW) Pumps

[1] Test Group A - pumps operated continuously

[2] Test Frequency/Method

RBCCW pumps are tested quarterly using the Group A Test Method (reference PR-01) and biennially using the Comprehensive Test Method.

[3] Hydraulic Test Path

(a) Group A Test Method - The RBCCW pump(s) will be operated in either single or parallel (two pump) configuration, as plant conditions allow, and tested in accordance with ISTB 5.3. Using the associated RBCCW Loop RHR Heat Exchanger Inlet Valve for throttling, establish a flow rate (based upon the number of pumps operating) in accordance with the surveillance test Procedure Pump discharge and suction pressures shall be recorded. The differential pressure (total dynamic head) will be calculated and compared to the established value (reference values that were established with the pump or pumps in the identical configuration; reference PR-01)

(b) Comprehensive Test Method - Each pump shall be tested by establishing single pump operation in the loop utilized for testing. Using the associated RBCCW Loop RHR Heat Exchanger Inlet Valve for throttling, establish a flow rate in accordance with current Technical Specifications/Design Basis requirements. Pump discharge and suction pressures shall be recorded. The differential pressure (total dynamic head) will be calculated and compared to the established value.

[4] Instrumentation

(a) <u>Inlet Pressure</u> (psig)· M&TE gauges at the locations of PI-4056A, PI-4054A, PI-4057A, PI-4006A, PI-4004A, and PI-4007A

(b) <u>Discharge Pressure</u> (psig): M&TE gauges at the locations of PI-4056, PI-4054, PI-4057, PI-4006, PI-4004, and PI-4007.

(c) <u>Flow rate</u>, Q (GPM) FT-6265, FT-6263

5.2 3 Residual Heat Removal (RHR) Pumps

[1] Test Group A - pumps operated rountinely during cold shutdown and refueling outages

[2] Test Frequency/Method

RHR pumps are tested quarterly using the Group A Test Method and biennially using the Comprehensive Test Method

[3] Hydraulic Test Path

Each pump shall be tested by establishing a flow path with suction from and discharge returning to the Torus (Heat Exchanger Bypass Valve open) Using the loop to the Suppression Chamber Spray Cooling Valve for throttling, establish a flow rate in accordance with current Technical Specifications requirements. Pump discharge and suction pressure shall be recorded. The differential pressure will be calculated and compared to the established value.

[4] Instrumentation

(a) <u>Inlet Pressure</u> (psig): M&TE test gauges at PI-1001-70A, PI-1001-70B, PI-1001-70C, PI-1001-70D.

(b) <u>Discharge Pressure</u> (psig) M&TE test gauges at PI-1001-71A, PI-1001-71B, PI-1001-71C, PI-1001-71D

(c) <u>Flow rate</u>, Q (GPM) EPIC Computer Points RHR022 (Loop A) and RHR024 (Loop B). When PDC98-07 is implemented, FI-1040-11A (Loop A) and FI-1040-11B may also be used for flow rate measurement

5.2.4 Core Spray (CS) Pumps

[1] Test Group B - pumps that are not operated routinely except for testing.

[2] Test Frequency/Method

CS pumps are tested quarterly using the Group B Test Method and biennially using the Comprehensive Test Method.

[3] Hydraulic Test Path

Each pump shall be tested by establishing a flow path with suction from and discharge returning to the Torus. Using the CS Full Flow Test Valve for throttling, establish a flow rate in accordance with current Technical Specifications requirements. Pump discharge and suction pressures shall be recorded and the differential pressure will be calculated and compared to the established value.

[4] Instrumentation

(a) Inlet Pressure (psig) M&TE test gauges at PI-40A, PI-40B.

(b) Discharge Pressure (psig) M&TE test gauges at PT-1460A, PT-1460B.

(c) Flow rate, Q (GPM) Flow indicators FI-1450-4A (Loop A) and FI-1450-4B (Loop B) or EPIC Computer Points CSP002 (Loop A) and CSP004 (Loop B).

5 2.5 High Pressure Coolant Injection (HPCI) Pump

[1] Test Group B - a pump that is not operated routinely except for testing

[2] Test Frequency/Method

The HPCI pump (reference PR-02) is tested quarterly using the Group B Test Method and biennially using the Comprehensive Test Method when adequate steam pressure is available.

[3] Hydraulic Test Path

The HPCI pump (main/booster integral unit) shall be tested by establishing a flow path with suction from and discharge returning to the CST. Using the HPCI Full Flow Test Valve for throttling, establish the speed and flow rate in accordance with current Technical Specifications requirements. Pump discharge and suction pressure shall be recorded. The differential pressure will be calculated and compared to the established value

[4] Instrumentation

(a) Inlet Pressure (psig)· PI-2340-1 or M&TE test gauge at PI-2381 (Quarterly Group B Test). M&TE test gauge at PI-2381 (Biennial Comprehensive Test).

(b) Discharge Pressure (psig). M&TE test gauge at PI-2357

(c) Flow rate, Q (GPM). FI-2340-1.

(d) Speed, N (RPM): M&TE tachometer.

5 2.6 Reactor Core Isolation Cooling (RCIC) Pump

[1] Test Group B - a pump that is not operated routinely except for testing.

[2] Test Frequency/Method

The RCIC pump is tested quarterly using the Group B Test Method and biennially using the Comprehensive Test Method when adequate steam pressure is available.

[3] Hydraulic Test Path

The RCIC pump shall be tested by establishing a flow path from and returning to the CST. Using the full flow test valve for throttling, establish the speed and flow rate in accordance with current Technical Specifications requirements Pump discharge and suction pressures shall be recorded. The differential pressure will be calculated and compared to the established value

[4] Instrumentation

(a) Inlet Pressure (psig): PI-1340-2 or M&TE gauge at 1360-20 (Quarterly Group B Test). M&TE test gauge at 1360-20 (Biennial Comprehensive Test).

(b) Discharge Pressure (psig): M&TE test gauge at PI-1360-5

(c) Flow rate, Q (GPM): FI-1340-1.

(d) Speed, N (RPM): M&TE tachometer.

5 2.7 Standby Liquid Control (SLC) Pumps

[1] Test Group B - pumps that are not operated routinely except for testing.

[2] Test Frequency/Method

SLC pumps are tested quarterly using the Group B Test Method and biennially using the Comprehensive Test Method.

[3] Hydraulic Test Path

(a) Test Tank Method - establishing a suction flow path from the main SLC Storage Tank and discharge returning to the SLC Test Tank shall test each pump. Using the test valve for throttling, establish a discharge pressure at a known reference value. Measure the time elapsed and the initial and final test tank levels. Calculate the flow rate by level change over time and compare to the established value Pump flow rate is being determined by an analytical method instead of being measured. This method is in compliance to Table ISTB 4 7 1-1

[4] Instrumentation

(a) Inlet Pressure, Pi. Not applicable.

(b) Discharge Pressure Pd (psig) PI-1159 or M&TE test gauge

(c) Flow rate, Q (inches): Test tank level change - measuring stick (graduated yardstick).

5 3 PUMP PROGRAM TABLE

The following pump table identifies the scope of pumps within the IST Program and allows cross-referencing specific pump test quantities to their implementing Station Procedure

The test quantities measured include Speed (N), Pressure - Discharge Pressure (Pd) or Differential Pressure (DP), Flow Rate (Q), and Vibration (V).

Newly incorporated component/test requirements will be identified by an asterisk (*) next to the implementing Procedure. When using (*) Procedures for postmaintenance testing, the current, approved Procedure should be reviewed for applicability (i.e., is the new test requirement incorporated).

PUMP TABLE
INSERVICE TEST QUANTITIES

SYSTEM	PUMP NO.	IST CLASS	P&ID/COORD.	TYPE A or B	TEST A OR B# PROC. (FREQ.)	COMPREHENSIVE# PROC. (FREQ)	SPEED (N)	PRESS DP	PRESS Pd	FLOW RATE (Q)	VIB.
SALT SERVICE WATER (SSW)	P-208A	3	M212/A8	A	8 5 3 2 1 (Q)	8 5 3 2 1 (2Y)	NA	Y	NA	Y	Y
	P-208B	3	M212/A7	A	8 5 3 2.1 (Q)	8 5.3 2 1 (2Y)	NA	Y	NA	Y	Y
	P-208C	3	M212/A6	A	8 5 3 2 1 (Q)	8 5 3 2 1 (2Y)	NA	Y	NA	Y	Y
	P-208D	3	M212/A4	A	8 5 3 2.1 (Q)	8 5.3.2 1 (2Y)	NA	Y	NA	Y	Y
	P-208E	3	M212/A5	A	8 5 3 2 1 (Q)	8 5 3 2 1 (2Y)	NA	Y	NA	Y	Y
REACTOR BUILDING CLOSED COOLING WATER (RBCCW)	P-202A	3	M215 (S5)/F3	A	8 5 3.17* (Q)	8 5 3.18 (2Y)*	NA	Y	NA	PR-01	Y
	P-202B	3	M215 (S5)/G3	A	8 5 3 17* (Q)	8 5 3 18 (2Y)*	NA	Y	NA	PR-01	Y
	P-202C	3	M215 (S5)/G3	A	8 5 3 17* (Q)	8.5.3 18 (2Y)*	NA	Y	NA	PR-01	Y
	P-202D	3	M215 (S5)/G6	A	8 5 3 17* (Q)	8 5 3 18 (2Y)*	NA	Y	NA	PR-01	Y
	P-202E	3	M215 (S5)/G6	A	8 5 3 17* (Q)	8 5 3 18 (2Y)*	NA	Y	NA	PR-01	Y
	P-202F	3	M215 (S5)/F6	A	8 5 3.17* (Q)	8 5 3.18 (2Y)*	NA	Y	NA	PR-01	Y
RESIDUAL HEAT REMOVAL (RHR)	P-203A	2	M241 (S2)/D6	A	8 5 2 2 1 (Q)	8 5 2 2 1 (2Y)	NA	Y	NA	Y	Y
	P-203B	2	M241 (S2)/D4	A	8 5 2 2 2 (Q)	8 5 2 2 2 (2Y)	NA	Y	NA	Y	Y
	P-203C	2	M241 (S2)/F6	A	8 5 2 2 1 (Q)	8 5 2 2 1 (2Y)	NA	Y	NA	Y	Y
	P-203D	2	M241 (S2)/F4	A	8 5 2 2 2 (Q)	8 5 2 2 2 (2Y)	NA	Y	NA	Y	Y
CORE SPRAY (CS)	P-215A	2	M242/C4	B	8.5 1 1 (Q)	8 5 1 1 (2Y)	NA	Y	NA	Y	Y**
	P-215B	2	M242/C3	B	8 5 1 1 (Q)	8 5 1 1 (2Y)	NA	Y	NA	Y	Y**
HIGH PRESSURE COOLANT INJECTION (HPCI)	P-205 (PR-02)	2	M244/E4	B	8 5 4 1 (Q)	8.5.4 1 (2Y)	Y	Y	NA	Y	PR-03**
	P-220	2	M244/B2	NA ##	8 5.4 1 (Q)	8 5 4 1 (2Y)	NA	NA	NA	NA	NA
REACTOR CORE ISOLATION COOLING (RCIC)	P-206	2	M246/E5	B	8 5 5 1 (Q)	8 5 5 1 (2Y)	Y	Y	NA	Y	Y**
	P-221	2	M244/B3	NA ##	8 5 5 1 (Q)	8 5 5 1 (2Y)	NA	NA	NA	NA	NA
STANDBY LIQUID CONTROL (SLC)	P-207A	2	M249/E5	B	8 4 1 (Q)	8 4 1 (2Y)	NA	NA	Y	Y	Y**
	P-207B	2	M249/D5	B	8 4 1 (Q)	8 4 1 (2Y)	NA	NA	Y	Y	Y**

\# The required instrument accuracy for pressure and differential pressure when performing Group A or B Tests is 2% and Comprehensive or Preservice Tests is 1/2%

\## Skid-mounted pump exempt from testing.

** Group B Test Method only requires monitoring of hydraulic parameters (i e , vibration parameters not required).

6.0 INSERVICE VALVE TESTING

6.1 GENERAL INFORMATION

[1] Applicable Code

This Inservice Testing Program addresses those valves and pressure relief devices (and their actuating and position indicating systems) that meet the requirements of Subsection ISTC of ASME OMa Code 1995 Edition through Addenda 1996. The applicability of the subsection establishes the requirements for preservice and inservice testing to assess the valve's or pressure relief device's operational readiness. Both active and passive valves are covered by this Procedure and include those that are required in shutting down the Reactor to the safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident. The pressure relief devices covered are those for protecting systems or portions of systems that are required in shutting down the Reactor to the safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident. The following exclusions exist valves used only for operating convenience (i.e., vent, drain, instrument, and test valves), valves used only for system control (i.e., pressure regulating valves), and valves used only for system or component maintenance. Skid-mounted valves and component subassemblies that are tested as part of the major component are excluded when determined by the owner to be adequately tested. Additionally, external control and protection systems responsible for sensing plant conditions and providing signals for valve operation are excluded.

Where the above requirements for ASME Class 1, 2, or 3 valves and pressure relief devices are determined to be impractical, specific justifications and requests for relief have been written and included in Section 7.0 as follows:

(a) RELIEF REQUEST (VR-XX): Relief Requests are included in Section 7.6 and identify impractical test requirements. These Relief Requests must be reviewed and approved by the NRC prior to use

(b) COLD SHUTDOWN JUSTIFICATION (CS-XX) These justifications are located in Section 7.2 The justification provides the mechanism for documenting the bases for performing a specific test on a cold shutdown (CS) frequency.

(c) REFUELING OUTAGE JUSTIFICATION (RJ-XX): These justifications are located in Section 7.3. The justification provides the mechanism for documenting the bases for performing a specific test on a refueling interval (RI) frequency (usually during a refueling outage) as well as specifying the alternative requirements.

(d) DISASSEMBLY EXAMINATION JUSTIFICATION (DJ-XX): These justifications are located in Section 7 4 The justification provides the mechanism for documenting the bases for establishing a sample disassembly examination program, to verify valve obturator movement, on a refueling interval (RI) frequency.

(e) SERIES VALVE PAIR JUSTIFICATION (SJ-XX): These justifications are located in Section 7.5. The justification provides the mechanism for documenting the bases for testing valves as a series pair, as well as providing the alternative requirements.

[2] Inservice Valve Testing Program Table

The tables contained in Section 6.2 list all IST Class 1, 2, and 3 valves that are tested to meet IST requirements Skid-mounted valves are identified but are excluded from testing.

The tables are sorted by system and Piping and Instrumentation Diagram (P&ID) number(s) and contain the following information

(a) Valve Number. Valve identification number.

(b) P&ID Coord: Coordinate location and sheet number on the P&ID.

(c) IST Class. IST Classification (Class 1, 2, or 3)

(d) Valve Cat: Category assigned to the valve is based on ISTC 1.4, Categories of Valves. Categories A through D are defined in the Code subsection. Category AC is specified when more than one distinguishing characteristic from both A and C categories is applicable However, the duplication of common testing requirements (i.e , leak testing) is not necessary.

(1) Category A - valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their function.

(2) Category B - valves for which a specific amount of leakage in the closed position is inconsequential for fulfillment of their function.

(3) Category C - valves which are self-actuating in response to some system characteristic, such as pressure (safety and relief valves including vacuum relief valve) or flow direction (check valves).

(4) Category D - valves which are actuated by an energy source capable of only one operation such as rupture disks or explosive actuated valves.

(5) Category AC - valves which exhibit both Category A and Category C characteristics

(e) Valve Size: Nominal pipe size (in inches).

(f) Valve Type: Valve Body Design

ANGLE	AN	NEEDLE	ND
BALL	BL	PLUG	PG
BUTTERFLY	BF	RELIEF	RL
CHECK	CK	RUPTURE DISC	RD
EXCESS FLOW	EF	SAFETY	SV
GATE	GA	SHEAR	SH
GLOBE	GL	STOP CHECK	SC
		SPRING CHECK	SK

(g) Actuator Type Valve Actuator Power;

MOTOR OPERATOR	MO	EXPLOSIVE ACTUATOR	EX
AIR OPERATOR	AO	MANUAL	MA
SOLENOID OPERATOR	SO	SELF-ACTUATED	SA
HYDRAULIC OPERATOR	HO		

(h) Normal Position Normal Position During Plant Operation;

NORMAL OPEN	O	LOCKED OPEN	LO
NORMAL CLOSED	C	LOCKED CLOSED	LC

(i) Test Requirement Test(s) that will be performed to fulfill the requirements of Subsection ISTC Test definitions and abbreviations are identified in Table 1.

(j) Test Frequency: Frequency at which the tests will be performed. The frequency definitions and abbreviations used are identified in Table 2, Test Frequency.

(k) PNPS Procedure No.: The PNPS Surveillance Procedure that satisfies each specific test requirement.

(l) Safety Direction. Direction the valve is exercised to during stroke time measurement or a check valve exercise. The direction for power operated valve stroke timing and check valve exercising is that which is required to fulfill the valve's safety-related function(s) according to the Updated FSAR and/or Technical Specifications.

OPEN	O	CLOSED	C

(m) Relief/Justification: Refer to the following sections: Section 7 2 for cold shutdown Justifications (CS-XX), Section 7.3 for Refuel Outage Justifications (RJ-XX), Section 7.4 for Disassembly Examination Justifications (DJ-XX), Section 7.5 for Series Valve Pair Justifications (SJ-XX), and Section 7.6 for Valve Relief Requests (VR-XX).

(n) Notes· Clarification to identify any of the following information:

(1) Special or unique classification (i e , Exempt, Passive)

(2) Specific information related to that test requirement

(3) Alternate test procedure(s)

[3] Excluded Valves

Valves excluded according to ISTC 1.2 and passive valves that do not have a specific leakage requirement are not included in the IST Program. A passive valve is a valve that maintains obturator position and is not required to change obturator position to accomplish the required function(s).

Subsection ISTC excludes valves provided that they are not required to perform a specific function in shutting down the Reactor to the safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident includes:

- Valves used only for operating convenience, system control, and maintenance
- Skid-mounted valves and component subassemblies are excluded provided that they are tested as part of the major component and determined by the owner to be adequately tested.
- External control and protection systems responsible for sensing plant conditions and providing signals for valve operation.

Control valves whose actuators are required to provide a fail-safe position have been included in the program in accordance with Generic Letter 89-04 and are fail-safe tested only. Excluded valves with remote position indicators have been included so their position indicators will be checked with the "excluded" status noted.

[4] Check Valve Condition Monitoring Program (CMP)

PNPS has developed a check valve Condition Monitoring Program in accordance with ISTC 4.5.5. This program is an alternative to the testing requirements of ISTC 4.5.1 through ISTC 4.5 4 Check valves have been placed in the Condition Monitoring Program with the purpose of improving check valve performance and to optimize activities to maintain the continued acceptable performance of the selected valves.

This CMP complies with OM Code Appendix II. This mandatory Appendix contains the requirements to augment the rules of Subsection ISTC. In addition to the mandatory Appendix, the limitations and modifications specified in 10CFR50.55a(b)(3) for implementing the Appendix II, "Check Valve Condition Monitoring Program", of the OM Code 1995 Edition with the 1996 Addenda, are mandated as part of the PNPS Condition Monitoring Program

The Valve Program Tables in Section 6.2 of this Procedure assign a test frequency of "CMP" for each valve selected as part of the Condition Monitoring Program. The Valve Program table for CMP valves will continue to specify other Code-related information, such as justifications, notes, safety direction, and test requirements for the selected valves. These items will have no impact on the CMP but will remain for historical informational purposes. IST 4.5 5 requires that if Condition Monitoring is discontinued for a valve or valve group, then the requirements of ISTC 4.5.1 through ISTC 4.5.4 shall apply

The following check valves have been placed into the PNPS Condition Monitoring Program

CONDITION MONITORING PROGRAM VALVES	
Valve No.	**Valve Title**
CK-1001-2A	RHR Pump A Minimum Flow Check Valve
CK-1001-2B	RHR Pump B Minimum Flow Check Valve
CK-1001-2C	RHR Pump C Minimum Flow Check Valve
CK-1001-2D	RHR Pump D Minimum Flow Check Valve
CK-1001-68A	RHR Loop A Injection Check Valve
CK-1001-363A	RHR Loop A Keepfill Check Valve
CK-1001-362B	RHR Loop B Keepfill Check Valve
CK-1400-9A	CS Loop A Injection Check Valve
CK-1400-9B	CS Loop B Injection Check Valve
CK-1400-13A	CS Pump A Minimum Flow Check Valve
CK-1400-13B	CS Pump B Minimum Flow Check Valve
CK-1400-36A	CS Pump A Discharge Check Valve
CK-1400-36B	CS Pump B Discharge Check Valve
CK-1400-212A	CS Loop A Keepfill Check Valve
CK-1400-212B	CS Loop B Keepfill Check Valve
CK-2301-20	HPCI Condensate Storage Tank Pump Suction Check Valve
CK-2301-39	HPCI Torus Pump Suction Check Valve
CK-2301-40	HPCI Pump Minimum Flow Check Valve
CK-1301-23	RCIC Condensate Storage Tank Pump Suction Check Valve
CK-1301-27	RCIC Torus Pump Suction Check Valve
CK-1301-47	RCIC Pump Minimum Flow Check Valve
CK-1101-16	SLC Outboard Containment Isolation Valve
CK-1101-43A	SLC Pump A Discharge Check Valve
CK-1101-43B	SLC Pump B Discharge Check Valve

[5] Measurement of Test Quantities

(a) Stroke Time: The preferred stroke time method is the time interval from initiation of the actuating signal to the end of the actuating cycle. Alternate stroke timing methods may be utilized and are discussed within PNPS 8.I.1, *"Administration of Inservice Pump and Valve Testing"*. The stroke time acceptance value(s) for each power-operated valve is specified within the appropriate test Procedure. These times shall be measured at least to the nearest second. Additionally, abnormal or erratic action shall be recorded and evaluated

(b) Position Indication Valve disk movement is determined by exercising the valve while locally observing the appropriate indicators which signal the required change of disk position. Where local observation is not possible, other indications shall be used for verification of valve operation. A suitable method is the use of indirect evidence (such as changes in system pressure, flow rate, level, or temperature) which reflects stem or disk position to verify that remote position indicators agree with valve travel direction

(c) Seat Leakage: Seat leakage is measured by one of the following methods.

(1) Measuring leakage through a downstream telltale connection while maintaining test pressure on one side of the valve.

(2) Measuring the feed rate required to maintain test pressure in the test volume or between two seats of a gate valve, provided that the total apparent leakage rate is charged to the valve or valve combination or gate valve seat being tested and the conditions required by ISTC 4.3 3(b) are satisfied.

(3) Determining leakage by measuring pressure decay in the test volume, provided that the total apparent leakage rate is charged to the valve or valve combination or gate valve seat being tested and the conditions required by ISTC 4 3.3(b) are satisfied.

Exception: Containment isolation valves are seat leak tested in accordance with the 10CFR50 Appendix J program.

(d) Check Valve Exercise Test: Each OM Code exercise test shall include both exercise open and exercise close tests. Exercise open and exercise close tests need only be performed at an interval when it is practicable to perform both tests. Test order (e.g., whether the exercise open test precedes the exercise close test) is not important and not required to be performed at the same test frequency as long as they are both performed within the same test interval. Observations shall be made by observing a direct indicator (e.g., a position-indicating device) or by other positive means (e g , changes in system pressure, flow rate, level, temperature, seat leakage, testing, or nonintrusive testing results). The following test practices will be utilized:

(1) Safety function in both open and close directions - shall be tested by initiating flow and observing that the obturator has traveled to either the full open position or to the position required to perform its intended function(s) and verify that, on cessation or reversal of flow, the obturator has traveled to the seat

(2) Safety function in open direction only - shall be tested by initiating flow and observing that the obturator has traveled to either the full open position or to the position required to perform its intended function(s) and verify closure.

(3) Safety function in closed direction only - shall be tested by initiating flow and observing that the obturator has traveled to at least the partially open position (i.e., normal or expected system flow position) and verify that, on cessation or reversal of flow, the obturator has traveled to the seat.

(4) Mechanical Exerciser - the breakaway force or torque delivered to the disk by the exerciser shall not vary by more than 50% from the established reference value. The reference value shall be obtained when the valve is known to be operating properly and taken under conditions as close as practicable to the conditions under which the valve will be tested (e.g., wet versus dry, equivalent static head, etc.).

(5) Vacuum Breaker - for check valves that perform as vacuum breakers, the exerciser force or torque delivered to the disk may be equivalent to the desired functional pressure differential force. Also, the disk movement shall be sufficient to prove that the disk moves freely off the seat. If no functional pressure differential force is specified, only disk movement is required

(e) Check Valve Disassembly: For certain check valves in which the safety function (i.e., sufficient flow, full open position or travel to seat) cannot be satisfied by the acceptable test methods, a sample disassembly examination program may be used to verify valve obturator movement. The sample program has the following restrictions:

(1) Grouping of check valves to be technically justified and consider, as a minimum, manufacturer, design, service, size, materials of construction, and orientation

(2) The full-stroke motion of the obturator shall be verified during disassembly. The full stroke motion of the obturator shall be reverified immediately prior to completing reassembly Additionally, valves that have their obturator disturbed before the full-stroke motion (e g., spring-loaded lift check valves or check valves with the obturator supported from the bonnet) are examined to determine whether a condition exists that could prevent full opening or reclosure of the obturator.

(3) One check valve of each group is disassembled and examined each refueling outage with all valves in each group being disassembled and examined at least once every 8 years.

(4) Valves that were disassembled and examined or that received maintenance that could affect their performance shall be exercised if practicable prior to being returned to service.

The check valve disassembly program will be controlled in accordance with PNPS 8.I.27. Currently no check valves are assigned to the disassembly program.

(f) Nonintrusive Testing Of Check Valves: Nonintrusive testing (NIT) is an acceptable method for verifying valve obturator movement in accordance with ISTC 4.5.4(3). However, if the NIT results are inconclusive for verifying the check valve exercise test, then another acceptable method may be used. If no other methods can be used to perform the exercise test, then the affected valve may be disassembled using the guidelines within PNPS 8 I.27, *"Inservice Check Valve Sample Disassembly and Exercise Program"* For check valves that are periodically verified through NIT techniques as being exercised, a sample plan may be employed. The sample plan will typically use the alternative requirements specified within ISTC 4.5 5, Condition Monitoring Program. NIT sample testing will be controlled in accordance with PNPS 8.I.37, *"Inservice Check Valve Nonintrusive Testing for Exercise Program"*.

(g) Excess Flow Check Valve (EFCV) Testing Relaxation: NEDO-32977-A and the associated NRC Safety Evaluation, dated March 14, 2000, provide the basis for relaxing the EFCV testing frequency The relaxation of the number of EFCVs tested every refueling outage is from "each" to a "representative sample" (nominally once every 24 months). The representative sample is based on (approximately) 20% of the valves tested each 2-year cycle such that each valve is tested every 10 years (nominal). Refer to VR-01 and VR-02 for applicable EFCVs and specific implementation data.

(h) Relief Valves: Periodic testing of pressure relief valves is required No maintenance, adjustment, disassembly, or other activity which could affect "as found" set-pressure or seat tightness data is permitted prior to testing. The ASME OM Code Interpretation No. 98-8, ASME/ANSI OM-1987, Part 1, Para 3 3.1.1, Main Steam Pressure Relief Valves With Auxiliary Actuating Devices, provides concurrence that PNPS use of a slave main valve body for testing SRV pilot assemblies is acceptable and in compliance with Appendix I, Section I 3 3 (Periodic Testing) requirements

(1) Class 1 Main Steam Pressure Relief Valves With Auxiliary Actuating Devices are to be tested in the following sequence: visual examination, seat tightness determination, and set-pressure determination. Then the remaining may be performed following maintenance or set-pressure adjustment electrical characteristic and pressure integrity of solenoid valves, pressure integrity and stroke capability of air actuator, electrical characteristics of position indicators, electrical characteristics of bellows alarm switch, actuating pressure of sensing element devices and continuity, and owner's seat tightness criteria, when applicable.

(2) Class 1 Main Steam Pressure Relief Valves Without Auxiliary Actuating Devices are to be tested in the following sequence: visual examination, seat tightness determination, and set-pressure determination. Then the remaining may be performed following maintenance or set-pressure adjustment: electrical characteristics of position indicators and owner's seat tightness criteria, when applicable.

(3) Class 2 and 3 Pressure Relief Valves are to be tested in the following sequence: visual examination, seat tightness determination, and set-pressure determination. Then the remaining may be performed following maintenance or set-pressure adjustment: integrity of the balancing device on balanced valves and owner's seat tightness criteria, when applicable.

[6] Allowable Ranges of Test Quantities

(a) Stroke Time: Stroke time acceptance criteria are categorized as being applicable to either electric motor-operated or power-operated (e.g., air-operated, solenoid-operated, hydraulic-operated, etc.) valves The observed stroke times will not exceed the following Acceptance Criteria:

(1) Electric motor-operated valves with reference stroke times greater than 10 seconds shall exhibit no more than $\pm 15\%$ change in stroke time when compared to the reference value.

(2) Power-operated valves with reference stroke times greater than 10 seconds shall exhibit no more than $\pm 25\%$ change in stroke time when compared to the reference value.

(3) Electric motor-operated valves with reference stroke times less than or equal to 10 seconds shall exhibit no more than a $\pm 25\%$ nor ± 1 second change in stroke time, whichever is greater, when compared to the reference value

(4) Power-operated valves with reference stroke times less than or equal to 10 seconds shall exhibit no more than $\pm 50\%$ change in stroke time when compared to the reference value.

(5) Valves with stroke times less than 2 seconds may be exempted from the reference value change requirement For these cases, the maximum limiting stroke time will be 2 seconds

(b) Position Indication: During valve opening and closure following maintenance, the remote position indicators shall accurately reflect valve travel direction.

(c) Seat Leakage.

(1) Valve leakage rates shall not exceed the value established by PNPS Engineering. These leakage values are specified within the implementing test Procedures. Valves (or valve combinations) that fail to meet the acceptance criteria shall be declared inoperable immediately and require corrective action.

(2) The Code recommended "permissible" leakage rates for a valve or a valve combination not specified by the owner (PNPS Engineering) are as follows for water 0.5D gal/min or 5 gal/min, whichever is less, at function pressure differential, or for air, at function pressure differential, 7.5D standard ft^3/day where D equals nominal valve size, inches. Refer to ISTC 4.3 3(e) for further guidance.

[7] Instrument Requirements

Instruments used to measure stroke times shall be capable of measurement to the nearest tenth of a second.

[8] Corrective Action

(a) Stroke Time

(1) If a valve fails to exhibit the required change of obturator position or exceeds the limiting value of full-stroke time, it shall be immediately declared inoperable.

(2) Valves that do not meet the measured stroke time acceptance criteria shall be immediately retested or declared inoperable. If the valve is retested and the second set of data does not meet the acceptance criteria, the data shall be analyzed within 96 hours to verify that the new stroke time represents acceptable valve operation, or the valve shall be declared inoperable. If the second set of data meets the acceptance criteria, the cause of the initial deviation shall be analyzed and the results documented.

(3) Valves declared inoperable may be repaired, replaced, or the data may be analyzed to determine the cause of the deviation and the valve shown to be operating acceptably

(4) Before returning a repaired or replacement valve to service, a test shall be performed demonstrating satisfactory operational readiness

(5) A completed Attachment 4 of PNPS 8.I.32, combined with either a Corrective Action/Evaluation Form (Attachment 1 of PNPS 8.I.1) or a Surveillance Review Sheet (reference PNPS 1.3.34 Attachment 9) with ASME Test Engineer signature, satisfies the corrective action evaluation requirements for valve operability If necessary, a valve may be declared operable using the Surveillance Test Review process prior to revision of the affected stroke timing Procedure A revision to the Surveillance Procedure should then be implemented on a priority basis for future operability testing

(b) Seat Leakage: Corrective action shall be to repair or replace the valve or valve combination unless an Engineering analysis is performed which demonstrates that the leakage criteria may be increased and the new leakage rate will not impact the valve's ability to fulfill its safety function. The option to evaluate and increase leakage criteria should not be used for Reactor system pressure isolation valves (PIVs) without performance of an evaluation which includes consideration of applicable Code requirements.

(c) Relief Valves:

(1) Relief valves which fail to function properly during testing shall be: 1) adjusted, 2) repaired, or 3) replaced and retested to show acceptable operation. Procedure credit may be taken for valves that are tested by the vendor/manufacturer provided that similar test methods are used and the documentation verifies that the Surveillance Procedure acceptance criteria have been met.

(2) Requirements for testing additional valves: the following requirements shall be adhered to:

a. Class 1, 2, and 3 Safety and Relief Valves: For each valve tested which the as-found set-pressure exceeds the greater of either the ± tolerance limit of the owner-established set-pressure acceptance criteria or ± 3% of valve nameplate set-pressure, two additional valves shall be tested from that same valve group.

b Class 1, 2, and 3 Safety and Relief Valves: If the as-found set-pressure of any of the additional valves tested exceeds the criteria noted therein, then all remaining valves of that same valve group shall be tested

c. Class 1, 2, and 3 Safety and Relief Valves: Each valve that fails to comply with the set-pressure acceptance criteria shall have the cause and effect evaluated. Based upon this evaluation, PNPS will determine the need for additional tests required to address any generic concerns which could apply to the valves in the same or other valve groups

TABLE 1
INSERVICE VALVE TESTS

TEST	TEST NAME	TEST DESCRIPTION/DEFINITION
LJ	Containment Isolation Valves (Air)	Containment Isolation Valves (CIVs) will be seat leak tested using air in accordance 10CFR50 Appendix J as specified in ISTC 4.3 2, Containment Isolation Valves.
LJW	Containment Isolation Valves (Water)	Containment Isolation Valves (CIVs) will be seat leak tested with water at a pressure not less than 1.1 Pa and are not required to be added into the Type C leak test total. These isolation valves are tested to assure the seal-water fluid inventory is sufficient to assure the sealing function for at least 30 days Testing will be conducted in accordance with ISTC 4.3.3
LP	Pressure Isolation Valves	Pressure Isolation Valves (PIVs) are any two valves in series within the Reactor coolant pressure boundary which separate the high pressure Reactor coolant from an attached low pressure system and are normally closed. These valves will be seat leak tested in accordance with ISTC 4 3.1 and ISTC 4 3 3 The basis for PIV selection is provided in PNPS's response to Generic Letter 87-06
LEF	Excess Flow Check Valves	Excess Flow Check Valves (EFCVs) are a single instrument isolation valve within the Reactor coolant pressure boundary which separates the high pressure Reactor coolant from the dead-ended Reactor Building instrument in the unlikely event of a line failure These valves will be leak tested in accordance with ISTC 4.3.3 for a gross leakage check after the valve has been actuated. Refer to Valve Relief Requests VR-01 & VR-02 for basis.
LX	Miscellaneous Isolation Valves	Other safety related valves - Miscellaneous Isolation Valves will be seat leak tested in accordance with ISTC 4.3 1 and ISTC 4 3.3.
FE	Full Stroke Exercise	Exercise testing of Category A or B valves through one complete cycle of operation. 1) Normally open: Full stroke exercise the valve closed, then return to open position 2) Normally closed. Full stroke exercise the valve open, then return to closed position.
ST	Stroke Time	Stroke time is the measurement of the time required to exercise test a Category A or B valve through an operation. The direction for stroke time measurements is that which is required to fulfill its safety-related function in accordance with the Updated FSAR and/or Technical Specifications

TABLE 1
INSERVICE VALVE TESTS (Continued)

TEST	TEST NAME	TEST DESCRIPTION/DEFINITION
PE	Partial Stroke	Partial stroke exercise testing will be performed on those Category A or B valves that cannot be full stroke exercised during plant operation and have the capability to be partially exercised Then, full stroke exercise shall be performed during cold shutdowns, unless valves can only be partially exercised during cold shutdown.
OT	Exercise Open Test	The open test of the OM Code exercise test. Check valves will be verified in the open position by observing a direct indicator or by other positive means.
CT	Exercise Close Test	The close test of the OM Code exercise test. Check valves will be verified in the closed position by observing a direct indicator or by other positive means
RD	Rupture Disk Test	Rupture disks (nonclosing that are not testable) were test certified by the manufacturer or the startup testing program and no additional testing shall be required All rupture disks at PNPS are nontestable and shall be replaced in accordance with ANSI/ASME OM-1 every 5 years (Nonreclosing Pressure Relief Devices)
EX	Explosive Test	Testing of explosive charges by firing in accordance with ASME OM Code with at least 20% of the charges in a batch fired every 2 years with no charge exceeding 10 years.
RT	Relief Setpoint Test	Relief and Safety Valve setpoints will be verified in accordance with ASME OMa Code, Appendix I.
FS	Fail-Safe Test	Valves with fail-safe actuators (e.g , air operated, spring loaded, solenoid operated, and hydraulic operated) will be tested to verify proper fail-safe operation upon loss of actuator power.
PI	Position Indication Verification	Valves with remote position indicators will be checked to verify that remote valve position indicators accurately reflect valve travel direction.

TABLE 2
TEST FREQUENCY

TEST FREQ.	OPERATIONAL CONDITION	FREQUENCY OF TESTING
Q	Power Operation	At least once per 92 days, quarterly (Q).
CS	Cold Shutdown	See (2) below
RI	Refueling Interval	See (1) below. Testing must be performed prior to returning the plant to operation from a refueling outage.
RI#	Refueling Interval	See (1) below The frequency applies to check valve exercise open and exercise close tests that are not refueling outage dependent. The exercise open or close test must be performed within plus or minus 6 months from when the corresponding check valve refueling outage test is performed.
OBJ	No operational condition limitations	Testing frequencies will be established using the performance-based intervals in Option B of 10CFR50 Appendix J (OBJ). Applies to Containment Isolation Valve (CIV) seat leakage tests (LJ and LJW) See (3) below
PBT	No operational condition limitations	Testing frequencies will be established using a Performance-Based Test (PBT) interval as identified in VR-03 and VR-07. See (3) below.
PWT	No operational condition limitations	Testing frequency will correspond to applicable postwork tests (PWT) following applicable routine servicing, preventive or corrective maintenance No routinely scheduled testing applies to position indication tests (see ISTC 4.1).
CMP	No operational condition limitations	Testing frequencies will be established using the Condition Monitoring Program (CMP) intervals
2Y	No operational condition limitations	Every 2 years. Applies to seat leakage (excluding CIVs and VR-03 tests) (ISTC 4.3.3) and explosively actuated valve tests.
5Y	No operational condition limitations	Every 5 years. Applies to ASME Class 1 Safety/Relief Valves (see ASME OMa Code, Appendix I, 1.3.3) and ASME Class 1, 2, and 3 Rupture Disks (see ASME OMa Code, Appendix I, 1.3.4 & 1.3.6)
10Y	No operational condition limitations	Every 10 years. Applies to ASME Class 2 & 3 Safety/Relief Valves (see ASME OMa Code, Appendix I, 1.3 5) and explosively actuated valve tests (ISTC 4 6). Additionally, applies to specific ASME Class 2 Excess Flow Check Valves that have been identified by Relief Request which are sample tested (approximately 20% of the valves being tested each 2-year cycle) such that each valve is tested every 10 years (nominal). See (4) below.

TABLE 2
TEST FREQUENCY (Continued)

(1)	Refueling outage conditions are as contained in the definitions of the PNPS Technical Specifications. For inservice testing purposes, the refueling interval associated with refuel outage testing may be up to 2 years with an allowable extension of no more than 25%
(2)	Plant cold shutdown (reference: ISTC 4.2.2(g), ISTC 4.5.2(e), and PNPS Technical Specifications) testing is acceptable when the following conditions are met: (a) Testing is to commence as soon as practical when the cold shutdown condition is achieved, but not later than 48 hours after shutdown, and continue until complete or the plant is ready to return to power. (b) Completion of all testing is not a prerequisite to return to power. Any testing not completed during one cold shutdown should be performed during any subsequent cold shutdown starting with those tests not previously completed. (c) Testing need not be performed more often than once every 3 months. (d) In the case of extended cold shutdowns, the testing need not be started within the 48-hour limitation. However, in extended cold shutdowns, all cold shutdown testing must be completed prior to returning to power.
(3)	The Containment Isolation Valves, Pressure Isolation Valves, and Miscellaneous Isolation Valves that have valve seat leakage test frequencies utilize the performance-based test intervals in Option B of 10CFR50 Appendix J These seat leakage intervals range from test once per 30 months to 60 months and are established and controlled in accordance with PNPS 8.7.1.3.1
(4)	The "Chemequip" Excess Flow Check Valves (EFCVs) identified within VR-01 will receive a leakage test and reverse flow exercise as part of a sample test plan. The two "Dragon" EFCVs identified within VR-02 will require sample testing of one valve each refueling interval

TABLE 3
TERMINOLOGY COMPARISON

PNPS Technical Specifications Surveillance Interval definitions are to be applied to the following required frequencies for performing inservice testing activities These required intervals may be extended as allowed by the PNPS Technical Specifications "Surveillance Frequency" definition.

ASME B&PV CODE TERMINOLOGY FOR IST ACTIVITIES	REQUIRED FREQUENCIES FOR PERFORMING IST ACTIVITIES
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Quarterly (every 3 months)	At least once per 92 days
Semiannually (every 6 months)	At least once per 184 days
Yearly	At least once per 366 days
Biennual or every 2 years	At least once per 732 days

6.2 VALVE PROGRAM TABLE

This table identifies the scope of valves within the IST Program and allows cross-referencing specific valve test requirements to their implementing Station Procedure. The table sequence is by ascending P&ID number. (Compressed Air System is listed on P&IDs M220, M227, and M252.)

Newly incorporated component/test requirements will be identified by an asterisk (*) next to the implementing Procedure. When using (*) Procedures for postmaintenance testing, the current, approved Procedure should be reviewed for applicability (i e., is the new test requirement or component incorporated).

[1] Valve Test Index

System	P&ID	Revision	Page
Salt Service Water (29)	M212 Sh. 1	E80	39
Reactor Building Closed Cooling Water (30)	M215 Sh. 1 M215 Sh. 2 M215 Sh. 3 M215 Sh. 4	E48 E46 E37 E42	41
Compressed Air (31)	M220 Sh. 3	E66	43
Containment Atmosphere Control (45 & 9)	M227 Sh. 1 M227 Sh. 2	E55 E44	44
Compressed Air (31)	M227 Sh 1	E55	50
Nitrogen Supply (9)	M227 Sh. 2	E44	51
Radwaste Collection (20)	M232	E28	52
Post-Accident Sampling & Hydrogen And Oxygen Analyzer System (5065)	M239 Sh. 1 M239 Sh. 2 M239 Sh. 4 M239 Sh. 4	E25 E16 E24 E23	53
Residual Heat Removal System (1001)	M241 Sh. 1 M241 Sh. 2	E74 E43	59
Core Spray System (1400)	M242	E45	64
High Pressure Coolant Injection (2301 & 23)	M243 M244 Sh. 1	E48 E29	67
Reactor Core Cooling System (1301)	M245 M246 Sh. 1	E33 E29	71
Reactor Water Cleanup System (1201 & 12)	M247	E47	74
Standby Liquid Control System (1101)	M249	E25	75
Control Rod Drive Hydraulic System (302)	M250 Sh. 1 M250 Sh. 2	E56 E15	76

System	P&ID	Revision	Page
Recirc Pump Instrumentation (262)	M251 Sh. 1 M251 Sh. 2	E15 E16	78
Feedwater System (6)	M252 Sh. 2	E53	79
Nitrogen Supply (9)	M252 Sh. 1	E59	80
Reactor Recirculation System (202)	M252 Sh. 2	E53	81
Main Steam Isol., ADS, & Safety Relief (203)	M252 Sh. 1	E59	82
Nuclear Boiler System (220)	M252 Sh. 1 M252 Sh. 2	E59 E53	84
Nuclear Boiler Instrumentation (261)	M252 Sh. 2	E53	85
Reference Leg Backfill (C220X)	M253 Sh. 2	E22	87
Nuclear Boiler Vessel Instrumentation (263)	M253 Sh. 1 M253 Sh. 2	E38 E22	88
Traversing In-core Probe (45)	M1Q-1-5	E2	91

NOTE: The drawing revision level will require changing only if the revision affects information within the valve tables or a formal review of the program is performed against a later revision is to be documented.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID. M212 (SHEET 1) SYSTEM SALT SERVICE WATER SYSTEM (29)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
3800	G-8	3	B	18	BF	MO	O	FE ST PI	Q Q PWT	8 5 3 11 8 5 3 11 8 5 3 11	O	 VR-04	
3801	G-6	3	B	12	BF	MO	O	PE FE ST PI	Q CS CS PWT	8 5 3 11 8 I 11 14 8 I 11 14 8 I 11 14	C	 CS-04 CS-04 VR-04	
3805	G-5	3	B	12	BF	MO	O	PE FE ST PI	Q CS CS PWT	8.5.3 11 8 I 11 14 8 I 11.14 8 I 11 14	C	 CS-04 CS-04 VR-04	
3806	G-4	3	B	18	BF	MO	O	FE ST PI	Q Q PWT	8 5 3 11 8 5 3 11 8.5 3 11	O	 VR-04	
3808	C-6	3	B	12	BF	MO	O	FE ST PI	Q Q PWT	8 5 3.11 8 5 3 11 8 5 3 11	O/C	 VR-04	
3813	C-5	3	B	12	BF	MO	O	FE ST PI	Q Q PWT	8 5 3 11 8 5 3 11 8 5 3 11	O/C	 VR-04	
3823	F-7	3	B	18	BF	MA	C	FE	Q	2.2.32			
3824	G-8	3	B	18	BF	MA	C	FE	Q	2 2 32			
3827	F-6	3	B	12	BF	MA	O	FE	Q	2 2.32			
3828	F-6	3	B	12	BF	MA	C	FE	Q	2 2 32			
3829	F-7	3	B	12	BF	MA	C	FE	Q	2.2.32			
3832	F-5	3	B	12	BF	MA	O	FE	Q	2 2 32			
3833	F-4	3	B	12	BF	MA	C	FE	Q	2 2 32			
3834	F-5	3	B	12	BF	MA	C	FE	Q	2 2 32			
3837	F-4	3	B	18	BF	MA	O	FE	Q	2 2 32			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID. M212 (SHEET 1)

SYSTEM: SALT SERVICE WATER SYSTEM (29)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
3838	F-3	3	B	18	BF	MA	C	FE	Q	2 2 32			
3839	F-4	3	B	18	BF	MA	C	FE	Q	2 2.32			
3842	F-8	3	B	18	BF	MA	O	FE	Q	2 2 32			
3880A	B-7	3	C	12	CK	SA	O	OT	Q	8 5 3 2 1	O		
								CT	Q	8 5 3 2 1	C		
3880B	B-6	3	C	12	CK	SA	O	OT	Q	8 5 3 2 1	O		
								CT	Q	8 5 3 2 1	C		
3880C	B-5	3	C	12	CK	SA	O	OT	Q	8 5 3 2 1	O		
								CT	Q	8 5 3.2.1	C		
3880D	B-3	3	C	12	CK	SA	O	OT	Q	8 5 3 2 1	O		
								CT	Q	8 5 3 2 1	C		
3880E	B-4	3	C	12	CK	SA	O	OT	Q	8 5 3 2 1	O		
								CT	Q	8 5 3 2 1	C		
3915	D-3	3	B	6	BF	AO	O	FE	Q	8.5.3.11			
								ST	Q	8 5.3.11			
								FS	Q	8 5 3 11	C		
3925	D-3	3	B	6	BF	AO	O	FE	Q	8 5 3 11			
								ST	Q	8 5 3 11			
								FS	Q	8 5.3.11	C		
AV-38003	B-8	3	C	2	CK	SA	C	OT	Q	8 5 3 2 1			
								CT	Q	8 5 3 2 1	C		
AV-38004	B-7	3	C	2	CK	SA	C	OT	Q	8.5 3 2 1			
								CT	Q	8 5 3 2 1	C		
AV-38005	B-6	3	C	2	CK	SA	C	OT	Q	8 5 3 2 1			
								CT	Q	8 5 3 2 1	C		
AV-38006	B-4	3	C	2	CK	SA	C	OT	Q	8.5.3 2 1			
								CT	Q	8 5 3 2 1	C		
AV-38007	B-5	3	C	2	CK	SA	C	OT	Q	8 5 3 2 1			
								CT	Q	8 5 3 2 1	C		

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID· M215 (SHEETS 1, 2, 3, & 4)

SYSTEM. REACTOR BUILDING CLOSED COOLING WATER (30)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
419	SH 1/F-5	3	C	8	CK	SA	O	OT	RI	8.5 3.18*	O	RJ-22	Note 3/3.M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
420	SH 1/E-5	3	C	8	CK	SA	O	OT	RI	8 5 3 18*	O	RJ-22	Note 3/3 M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
421	SH 1/D-5	3	C	8	CK	SA	O	OT	RI	8 5 3 18*	O	RJ-22	Note 3/3 M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
422	SH 2/G-4	3	C	8	CK	SA	O	OT	RI	8 5 3 18*	O	RJ-22	Note 3/3 M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
423	SH.2/F-4	3	C	8	CK	SA	O	OT	RI	8.5.3.18*	O	RJ-22	Note 3/3.M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
424	SH 2/E-4	3	C	8	CK	SA	O	OT	RI	8 5 3 18*	O	RJ-22	Note 3/3 M 4-53
								CT	RI#	8 5 3 17*	C		Note 2
432	SH 3/E-8	2	AC	6	CK	SA	O	OT	RI#	8 I 31			
								CT	RI	8 7 1 5	C	RJ-01	
								LJ	OBJ	8 7 1 5			
4002	SH 3/E-4	2	A	6	GA	MO	O	FE	RI	8 I 11 13		RJ-18	
								ST	RI	8 I 11 13	C	RJ-18	
								PI	PWT	8 I 11 13*		VR-04	8 I.30 & 8 7 1 5
								LJ	OBJ	8 7 1 5			
4009A	SH 2/B-5	3	B	8	GA	MO	O	FE	RI	8.I.11 13		RJ-18	
								ST	RI	8 I 11 13	C	RJ-18	
								PI	PWT	8 I 11 13		VR-04	
4009B	SH.3/E-2	3	B	8	GA	MO	O	FE	CS	8 I 11 13		RJ-18	
								ST	CS	8 I.11.13	C	RJ-18	
								PI	PWT	8 I 11.13		VR-04	
4010A	SH 2/G-6	3	B	12	GA	MO	C	FE	Q	8 5 3.10			
								ST	Q	8 5 3 10	O		
								PI	PWT	8 5 3 10		VR-04	
4010B	SH 2/H-6	3	B	12	GA	MO	C	FE	Q	8.5.3.10			
								ST	Q	8 5 3 10	O		
								PI	PWT	8 5 3 10		VR-04	
4020	SH 4/D-7	3	C	0.75	RL	SA	C	RT	10Y	8 I 26 3			
4031	SH 4/D-6	3	C	3	RL	SA	C	RT	10Y	8.I.26.3			
4032	SH 2/H-7	3	C	3	RL	SA	C	RT	10Y	8.I.26 3			
4036	SH 2/H-7	3	C	0.75	RL	SA	C	RT	10Y	8 I 26 3			

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval

Note 2. Performance of PNPS 8 5 3 18* also satisfies the CT test requirement

Note 3 If work is performed on these check valves that requires a postmaintenance test (using PNPS 8 5 3 18*) and plant conditions do not allow conduct of PNPS 8 5 3 18*, then an exercise/examination using PNPS 3 M 4-53 must be satisfactorily completed for operability

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID M215 (SHEETS 1, 2, 3, & 4)

SYSTEM REACTOR BUILDING CLOSED COOLING WATER (30)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
4043A	SH 4/H-7	3	B	1 5	GL	AO	O	FE	NA	NA			Passive
								ST	NA	NA			
								FS	NA	NA			
4043B	SH 4/G-7	3	B	1.5	GL	AO	O	FE	NA	NA			Passive
								ST	NA	NA			
								FS	NA	NA			
4044A	SH 2/D-6	3	B	1 5	GL	AO	O	FE	NA	NA			Passive
								ST	NA	NA			
								FS	NA	NA			
4044B	SH 2/C-6	3	B	1 5	GL	AO	O	FE	NA	NA			Passive
								ST	NA	NA			
								FS	NA	NA			
4060A	SH 4/C-7	3	B	12	GA	MO	C	FE	Q	8 5 3.10			
								ST	Q	8 5 3 10	O		
								PI	PWT	8 5 3 10		VR-04	
4060B	SH 4/D-7	3	B	12	GA	MO	C	FE	Q	8 5 3.10			
								ST	Q	8 5 3 10	O		
								PI	PWT	8 5 3 10		VR-04	
4065	SH 4/A-7	3	B	6	GA	MO	O	FE	Q	8.5.3 10			
								ST	Q	8 5 3 10	C		
								PI	PWT	8 5 3 10		VR-04	
4083	SH 3/G-3	3	B	10	BF	MO	O	FE	Q	8 5 3 10			
								ST	Q	8 5 3 10	C		
								PI	PWT	8 5 3 10		VR-04	
4084	SH 1/D-7	3	B	10	BF	MO	O	FE	Q	8 5.3.10			
								ST	Q	8 5 3 10	C		
								PI	PWT	8 5 3 10		VR-04	
4085A	SH 1/G-3	3	B	8	GA	MO	O	FE	RI	8.I.11 13		RJ-20	
								ST	RI	8.I.11.13	C	RJ-20	
								PI	PWT	8 I 11 13		VR-04	
4085B	SH 1/F-4	3	B	8	GA	MO	O	FE	RI	8.I.11.13		RJ-20	
								ST	RI	8 I 11 13	C	RJ-20	
								PI	PWT	8 I 11 13		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID M220 (SHEET 3) SYSTEM. COMPRESSED AIR (31)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
167	SH 3/C-8	2	AC	3	CK	SA	O	OT CT LJ	RI# RI OBJ	8 7 4 4* 8 7 1 2 2 8 7 1 5	C	RJ-08	8.7.1.10 8 7.1.5

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID. M227 (SHEETS 1 & 2)

SYSTEM CONTAINMENT ATMOSPHERE CONTROL (45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
102 (45)	SH.1/C-5	2	A	1	GL	MA	C	FE LJ	NA OBJ	NA 8 7 1 5			Passive (Manual)
103 (45)	SH.1/C-5	2	A	1	GL	MA	C	FE LJ	NA OBJ	NA 8 7 1 5			Passive (Manual)
104 (45)	SH.1/C-5	2	A	1	GL	MA	C	FE LJ	NA OBJ	NA 8 7 1 5			Passive (Manual)
105 (45)	SH 1/C-5	2	A	1	GL	MA	C	FE LJ	NA OBJ	NA 8 7 1.5			Passive (Manual)
106 (45)	SH.1/E-4	2	A	4	GA	MA	C	FE LJ	NA OBJ	NA 8 7 1 5			Passive (Manual)
X-201A (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8.A 1 8.7 1 9 8.A.2	O C	VR-04	8 I 30
X-201B (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8 A 1 8 7 1 9 8 A 2	O C	VR-04	8 I 30
X-201C (45)	SH.1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8 A 1 8 7 1 9 8 A 2	O C	VR-04	8.I 30
X-201D (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8 A.1 8 7 1 9 8 A 2	O C	VR-04	8 I 30
X-201E (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8 A 1 8 7 1.9 8 A 2	O C	VR-04	8.I.30
X-201F (45)	SH.1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A 1 8 A 1 8 7 1 9 8.A 2	O C	VR-04	8 I 30
X-201G (45)	SH.1/C-6	2	AC	18	CK	SA (Testable)	C	OT CT PI LX	Q Q PWT RI	8 A.1 8 A 1 8 7 1 9 8 A 2	O C	VR-04	8 I 30

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEETS 1 & 2)

SYSTEM. CONTAINMENT ATMOSPHERE CONTROL
(45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
X-201H (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT	Q	8 A 1	O		
								CT	Q	8 A.1	C		
								PI	PWT	8 7 1 9		VR-04	8 I 30
								LX	RI	8 A 2			
X-201J (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT	Q	8 A.1	O		
								CT	Q	8 A.1	C		
								PI	PWT	8 7 1 9		VR-04	8 I.30
								LX	RI	8 A 2			
X-201K (45)	SH 1/C-6	2	AC	18	CK	SA (Testable)	C	OT	Q	8 A 1	O		
								CT	Q	8 A 1	C		
								PI	PWT	8 7 1 9		VR-04	8 I 30
								LX	RI	8 A 2			
X-212A (45)	SH 1/A-7	2	AC	20	CK	SA	C	OT	Q	8 7 4 9	O		
								CT	Q	8 7 4 9	C		
								PI	PWT	8 7 4 9*		VR-04	8.I.30/8 7 1 5
								LJ	OBJ	8 7 1 5			
X-212B (45)	SH.1/A-7	2	AC	20	CK	SA	C	OT	Q	8 7 4 9	O		
								CT	Q	8.7 4 9	C		
								PI	PWT	8 7 4 9*		VR-04	8.I.30/8 7 1 5
								LJ	OBJ	8 7 1 5			
5025 (45)	SH.1/E-8	2	A	8	BF	AO	C	NA	NA	NA			(De-Energized in Closed position) 8.I.30
								PI	PWT	8.7.1 5		VR-04	
								LJ	OBJ	8 7 1 5			
5033A (9)	SH 2/D-6	2	A	1	GL	AO	C	FE	Q	8 7 4 2			
								ST	Q	8 7 4 2	C		
								FS	Q	8.7 4 2	C		
								PI	PWT	8.7 4 2		VR-04	8.I 30
								LJ	OBJ	8 7 1 5			
5033B (9)	SH 2/C-6	2	A	4	GA	AO	C	FE	Q	8 7 4 2			
								ST	Q	8 7.4 2	C		
								FS	Q	8 7 4 2	C		
								PI	PWT	8 7 4 2		VR-04	8 I 30
								LJ	OBJ	8 7.1.5			
5033C (9)	SH 2/D-6	2	A	1	GL	AO	C	FE	Q	8 7 4 2			
								ST	Q	8.7.4 2	C		
								FS	Q	8 7 4 2	C		
								PI	PWT	8 7 4 2		VR-04	8 I 30
								LJ	OBJ	8.7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEETS 1 & 2)

SYSTEM: CONTAINMENT ATMOSPHERE CONTROL (45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
5035A	SH.1/D-2	2	A	8	BF	AO	C	FE	Q	8.7.4.2			
(45)								ST	Q	8 7.4 2	C		
								FS	Q	8.7.4 2	C		
								PI	PWT	8.7.4.2		VR-04	8.I.30
								LJ	OBJ	8.7.1 5			
5035B	SH.1/D-2	2	A	8	BF	AO	C	FE	Q	8.7.4 2			
(45)								ST	Q	8.7.4.2	C		
								FS	Q	8 7.4 2	C		
								PI	PWT	8.7 4 2		VR-04	8.I.30
								LJ	OBJ	8.7.1 5			
5036A	SH.1/C-2	2	A	8	BF	AO	C	FE	Q	8.7.4.2			
(45)								ST	Q	8.7.4.2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7 4 2		VR-04	8.I.30
								LJ	OBJ	8.7.1.5			
5036B	SH.1/C-2	2	A	8	BF	AO	C	FE	Q	8.7 4 2			
(45)								ST	Q	8.7.4 2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4.2		VR-04	8.I.30
								LJ	OBJ	8.7.1 5			
5040A	SH.1/B-7	2	A	20	BF	AO	C	FE	Q	8.7.4.9			
(45)								ST	Q	8 7 4 9	O/C		
								FS	Q	8.7 4 9	O		
								PI	PWT	8 7 4 9*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
5040B	SH.1/B-7	2	A	20	BF	AO	C	FE	Q	8.7.4.9			
(45)								ST	Q	8.7.4.9	O/C		
								FS	Q	8.7 4 9	O		
								PI	PWT	8 7.4 9*		VR-04	8.I.30 & 8 7 1.5
								LJ	OBJ	8.7 1 5			
5041A	SH.1/C-8	2	A	2	GL	AO	C	FE	Q	8.7.4 2			
(45)								ST	Q	8.7.4.2	C		
								FS	Q	8.7 4 2	C		
								PI	PWT	8.7.4.2		VR-04	8 I.30
								LJ	OBJ	8.7.1.5			
5041B	SH.1/C-7	2	A	2	GL	AO	C	FE	Q	8.7.4 2			
(45)								ST	Q	8.7.4.2	C		
								FS	Q	8.7 4 2	C		
								PI	PWT	8.7.4.2		VR-04	8 I 30
								LJ	OBJ	8.7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEETS 1 & 2)

SYSTEM: CONTAINMENT ATMOSPHERE CONTROL (45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
5042A (45)	SH.1/D-8	2	A	8	BF	AO	C	FE	Q	8.7.4 2			
								ST	Q	8.7.4.2	C		
								FS	Q	8.7 4.2	C		
								PI	PWT	8 7.4 2		VR-04	8 I 30
								LJ	OBJ	8.7.1.5			
5042B (45)	SH 1/D-7	2	A	8	BF	AO	C	FE	Q	8.7.4.2			
								ST	Q	8.7 4.2	C		
								FS	Q	8 7.4.2	C		
								PI	PWT	8.7 4.2		VR-04	8 I 30
								LJ	OBJ	8.7.1 5			
5043A (45)	SH 1/E-7	2	A	2	GL	AO	C	FE	Q	8.7.4.2			
								ST	Q	8 7 4 2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8 7 4 2		VR-04	8.I 30
								LJ	OBJ	8 7.1 5			
5043B (45)	SH.1/E-6	2	A	2	GL	AO	C	FE	Q	8.7.4 2			
								ST	Q	8.7.4.2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4.2		VR-04	8.I.30
								LJ	OBJ	8.7.1.5			
5044A (45)	SH.1/G-7	2	A	8	BF	AO	C	FE	Q	8.7.4 2			
								ST	Q	8.7.4.2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4 2		VR-04	8.I.30
								LJ	OBJ	8.7.1 5			
5044B (45)	SH.1/G-6	2	A	8	BF	AO	C	FE	Q	8.7.4.2			
								ST	Q	8.7 4.2	C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4.2		VR-04	8.I 30
								LJ	OBJ	8.7.1 5			
5081A (45)	SH.1/G-5	2	A	1	GA	SO	C	FE	Q	8.7 4 2			
								ST	Q	8.7.4 2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8 7.1 5			
5081B (45)	SH.1/G-5	2	A	1	GA	SO	C	FE	Q	8.7.4.2			
								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4 2	C		
								PI	PWT	8 7 4		VR-04	
								LJ	OBJ	8.7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEETS 1 & 2)

SYSTEM. CONTAINMENT ATMOSPHERE CONTROL (45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
5082A (45)	SH.1/G-5	2	A	1	GA	SO	C	FE	Q	8 7.4 2			
								ST	Q	8 7.4.2	O/C		
								FS	Q	8 7.4.2	C		
								PI	PWT	8 7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5082B (45)	SH.1/G-5	2	A	1	GA	SO	C	FE	Q	8.7.4 2			
								ST	Q	8 7.4 2	O/C		
								FS	Q	8 7 4 2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5083A (45)	SH.1/H-8	2	A	1	GA	SO	C	FE	Q	8 7 4 2			
								ST	Q	8 7.4 2	O/C		
								FS	Q	8 7.4 2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5083B (45)	SH.1/G-8	2	A	1	GA	SO	C	FE	Q	8.7.4.2			
								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4 2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5084A (45)	SH.1/H-8	2	A	1	GA	SO	C	FE	Q	8 7.4 2			
								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5084B (45)	SH.1/G-8	2	A	1	GA	SO	C	FE	Q	8 7.4.2			
								ST	Q	8.7 4 2	O/C		
								FS	Q	8.7.4 2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1.5			
5085A (9)	SH.2/E-7	2	A	1	GA	SO	C	FE	Q	8.7.4 2			
								ST	Q	8.7.4 2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1 5			
5085B (9)	SH.2/D-7	2	A	1	GA	SO	C	FE	Q	8.7.4.2			
								ST	Q	8.7.4 2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8 7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES

P&ID: M227 (SHEETS 1 & 2)

SYSTEM. CONTAINMENT ATMOSPHERE CONTROL (45 & 9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
5086A	SH.2/E-6	2	A	1	GA	SO	C	FE	Q	8.7.4 2			
(9)								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1 5			
5086B	SH.2/D-6	2	A	1	GA	SO	C	FE	Q	8 7 4 2			
(9)								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4 2	C		
								PI	PWT	8 7 4		VR-04	
								LJ	OBJ	8 7 1.5			
5087A	SH.2/E-7	2	A	1	GA	SO	C	FE	Q	8 7 4 2			
(9)								ST	Q	8.7.4 2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7 4		VR-04	
								LJ	OBJ	8.7.1.5			
5087B	SH.2/D-7	2	A	1	GA	SO	C	FE	Q	8 7 4 2			
(9)								ST	Q	8 7.4 2	O/C		
								FS	Q	8 7.4 2	C		
								PI	PWT	8.7 4		VR-04	
								LJ	OBJ	8.7.1 5			
5088A	SH.2/E-7	2	A	1	GA	SO	C	FE	Q	8 7.4 2			
(9)								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8 7 4		VR-04	
								LJ	OBJ	8.7.1.5			
5088B	SH.2/D-7	2	A	1	GA	SO	C	FE	Q	8.7.4 2			
(9)								ST	Q	8.7.4.2	O/C		
								FS	Q	8.7.4.2	C		
								PI	PWT	8.7.4		VR-04	
								LJ	OBJ	8.7.1 5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEET 1)

SYSTEM: COMPRESSED AIR (31)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
434	SH.1/B-6	2	AC	1	CK	SA	C	OT CT LJ	RI# RI OBJ	8 A.1 8 7.1.2.2 8.7.1.5	C	RJ-08	8.7.1.5
5046	SH.1/B-6	2	A	1	GL	AO	C	NA LJ	NA OBJ	NA 8.7.1.5			Exempt (Test)

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M227 (SHEET 2)

SYSTEM: NITROGEN SUPPLY (9)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
340	SH.2/C-6	2	AC	1	CK	SA	C	OT	RI#	8 A 1			
								CT	RI	8.7.1.5	C	RJ-08	
								LJ	OBJ	8.7.1.5			
341	SH 2/C-6	2	AC	1	CK	SA	C	OT	RI#	8.A.1			
								CT	RI	8.7.1.5	C	RJ-08	
								LJ	OBJ	8.7.1 5			

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M232

SYSTEM: RADWASTE COLLCTTION (20)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
7011A	G-5	2	A	2	BL	AO	C	FE	Q	8.7 4.3			
								ST	Q	8.7.4.3	C		
								FS	Q	8.7.4.3	C		
								PI	PWT	8.7.1.5		VR-04	8.I.30
								LJ	OBJ	8.7.1 5			
7011B	G-5	2	A	2	BL	AO	C	FE	Q	8.7.4 3			
								ST	Q	8.7.4.3	C		
								FS	Q	8.7 4 3	C		
								PI	PWT	8 7 1 5		VR-04	8.I 30
								LJ	OBJ	8 7.1.5			
7017A	D-5	2	A	2	BL	AO	C	FE	Q	8 7.4.3			
								ST	Q	8.7.4.3	C		
								FS	Q	8.7.4.3	C		
								PI	PWT	8.7.1.5		VR-04	8.I 30
								LJ	OBJ	8 7.1.5			
7017B	D-5	2	A	2	BL	AO	C	FE	Q	8.7.4 3			
								ST	Q	8.7.4 3	C		
								FS	Q	8.7 4.3	C		
								PI	PWT	8.7.1.5		VR-04	8.I.30
								LJ	OBJ	8.7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
11A	SH.1/C-6	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 4		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
13B	SH.1/D-3	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7 4.1	O/C		
								FS	Q	8.7 4 1	C		
								PI	PWT	8.7.4 8.1		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
14A	SH.1/D-6	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7 4 1	C		
								PI	PWT	8.7 4 8.1		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
15B	SH.1/C-3	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.4		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
18A	SH.1/C-6	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7 4 8.4		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
20B	SH.1/D-4	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8 7.4 8.1		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
21A	SH.1/D-6	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4 8.1		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
22B	SH.1/C-3	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7 4.1	O/C		
								FS	Q	8 7 4 1	C		
								PI	PWT	8 7.4 8 4		VR-04	8.I 30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
24A	SH.1/D-6	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4.8 3		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
25B	SH.1/D-4	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8 7.4.1	O/C		
								FS	Q	8.7.4 1	C		
								PI	PWT	8 7.4 8.4		VR-04	8 I.30 & 8 7.1 5
								LJ	OBJ	8.7.1.5			
26A	SH.1/D-6	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8 7.4 1	C		
								PI	PWT	8.7.4 8.3		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
27B	SH.1/D-3	2	A	1	GL	SO	C	FE	Q	8.7 4.1			
								ST	Q	8 7 4.1	O/C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4 8.4		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
31B	SH.1/E-3	2	A	1	GL	SO	C	FE	Q	8.7 4.1			
								ST	Q	8 7 4 1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4.8.5		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
33A	SH.1/E-6	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7 4.1	O/C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8 7.4 8.3		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
35B	SH.1/E-4	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 5		VR-04	8 I.30 & 8 7.1 5
								LJ	OBJ	8 7.1 5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
37A	SH.1/E-5	2	A	1	GL	SO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4.8.3		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
63	SH.2/H-6	2	A	1	GL	SO	C	FE	Q	8 7 4 1			
								ST	Q	8 7 4 1	O/C		
								FS	Q	8 7 4 1	C		
								PI	PWT	8 7.4 8 2		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
64	SH.2/H-5	2	A	1	GL	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.2		VR-04	8 I.30 & 8 7.1.5
								LJ	OBJ	8.7.1 5			
65	SH.2/G-6	2	B	1	GA	SO	C	FE	Q	8 7.4.1			
								ST	Q	8.7 4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7 4 8 2		VR-04	
66	SH 2/G-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7 4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8 7 4 8 2		VR-04	
67	SH.2/D-6	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4 8 3		VR-04	
68	SH 2/D-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8 7 4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.3		VR-04	
69	SH.2/D-6	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.4		VR-04	
70	SH 2/D-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 4		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
71	SH 2/E-6	2	A	1	GA	SO	C	FE	Q	8.7 4.1			
								ST	Q	8.7 4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4.8.2		VR-04	8 I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
72	SH 2/E-5	2	A	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4.8.2		VR-04	8 I 30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
73	SH.2/A-6	2	B	1	GA	SO	C	FE	Q	8.7 4.1			
								ST	Q	8.7 4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8 7 4 8 3		VR-04	
74	SH.2/A-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.3		VR-04	
75	SH.2/A-6	2	B	1	GA	SO	C	FE	Q	8.7.4 1			
								ST	Q	8 7 4 1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4.8 4		VR-04	
76	SH.2/A-5	2	B	1	GA	SO	C	FE	Q	8 7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4.8.4		VR-04	
77	SH 2/E-6	2	A	1	GA	SO	C	FE	Q	8.7 4 1			
								ST	Q	8 7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7 4 8.2		VR-04	8 I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
78	SH.2/E-5	2	A	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7 4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4.8.2		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1 5			
79	SH.2/C-6	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8 7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7 4 8 4		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID· M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
80	SH.2/C-5	2	B	1	GA	SO	C	FE	Q	8.7 4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4 1	C		
								PI	PWT	8 7.4 8 4		VR-04	
81	SH.2/B-6	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8 7 4.1	C		
								PI	PWT	8 7 4 8 3		VR-04	
82	SH.2/B-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8 7.4 1	C		
								FS	Q	8 7 4 1	C		
								PI	PWT	8 7 4 8 3		VR-04	
83	SH.2/F-6	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8 7 4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.2		VR-04	
84	SH.2/F-5	2	B	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4 8 2		VR-04	
85	SH.2/G-6	2	A	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 2		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
86	SH.2/G-5	2	A	1	GA	SO	C	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	O/C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 2		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
87	SH.1/F-4	2	B	1	GL	AO	O	FE	Q	8 7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.1		VR-04	
88	SH.1/F-4	2	B	1	GL	AO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4 1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8.7.4 8.1		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M239 (SHEETS 1, 2, 4, & 5)

SYSTEM: POST-ACCIDENT SAMPLING & H_2 & O_2 ANALYZER SYSTEM (5065)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
89	SH.1/F-6	2	B	1	GL	AO	O	FE	Q	8.7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7 4.1	C		
								PI	PWT	8 7 4 8.1		VR-04	
90	SH.1/F-6	2	B	1	GL	AO	O	FE	Q	8 7.4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8 7 4.1	C		
								PI	PWT	8 7 4 8 1		VR-04	
91	SH.1/B-5	2	A	1	GA	AO	O	FE	Q	8.7 4 1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8.1		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
92	SH.1/B-4	2	A	1	GA	AO	O	FE	Q	8.7 4.1			
								ST	Q	8.7.4.1	C		
								FS	Q	8.7.4.1	C		
								PI	PWT	8.7.4 8 1		VR-04	8.I 30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
122A	SH.1/E-8	2	B	0.375	GA	SV	O	NA	NA	8.7 4.1	O/C		Skid-Mounted
								PI	PWT	8.7 4 8 5		VR-04	
122B	SH.1/E-1	2	B	0 375	GA	SV	C	NA	NA	8.7 4.1	O/C		Skid-Mounted
								PI	PWT	8.7.4.8.5		VR-04	
123A	SH.1/E-8	2	B	0.375	GA	SV	C	NA	NA	8.7 4.1	O/C		Skid-Mounted
								PI	PWT	8.7.4 8.5		VR-04	
123B	SH.1/E-1	2	B	0.375	GA	SV	C	NA	NA	8.7.4.1	O/C		Skid-Mounted
								PI	PWT	8 7 4 8 5		VR-04	
124A	SH.1/E-7	2	B	0.375	GA	SV	C	NA	NA	8.7.4.1	O/C		Skid-Mounted
								PI	PWT	8.7.4.8.5		VR-04	
124B	SH.1/E-2	2	B	0.375	GA	SV	C	NA	NA	8.7.4.1	O/C		Skid-Mounted
								PI	PWT	8.7 4 8.5		VR-04	
5117A	SH.4/G-4	2	B	0 375	GA	SV	C	NA	NA	8 M 3-13/14			Skid-Mounted
5117B	SH.5/G-5	2	B	0.375	GA	SV	C	NA	NA	8 M 3-13/14			Skid-Mounted
5137A	SH.4/F-4	2	B	0 375	GA	SV	C	NA	NA	8.M 3-13/14			Skid-Mounted
5137B	SH.5/F-5	2	B	0 375	GA	SV	C	NA	NA	8 M.3-13/14			Skid-Mounted

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M241 (SHEETS 1 & 2)

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM (1001 & 10)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
2A	SH.2/D-6	2	C	2	CK	SA	C	OT	CMP	8.I.37	O	RJ-06	NIT (Sample)
								CT	CMP	8 5.2 2.1	C		
2B	SH.2/D-3	2	C	2	CK	SA	C	OT	CMP	8.I.37	O	RJ-06	NIT (Sample)
								CT	CMP	8 5 2.2.2	C		
2C	SH.2/G-6	2	C	2	CK	SA	C	OT	CMP	8.I.37	O	RJ-06	NIT (Sample)
								CT	CMP	8.5 2 2.1	C		
2D	SH.2/G-3	2	C	2	CK	SA	C	OT	CMP	8 I 37	O	RJ-06	NIT (Sample)
								CT	CMP	8 5 2 2 2	C		
7A	SH 2/D-5	2	A	18	GA	MO	O	FE	Q	8.5.2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5 2 3		VR-04	
								LJW	OBJ	8.7.1 2			
7B	SH.2/D-4	2	A	18	GA	MO	O	FE	Q	8 5 2.3			
								ST	Q	8 5.2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
								LJW	OBJ	8.7.1.2			
7C	SH.2/F-5	2	A	18	GA	MO	O	FE	Q	8.5 2 3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
								LJW	OBJ	8.7.1.2			
7D	SH.2/F-4	2	A	18	GA	MO	O	FE	Q	8 5.2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
								LJW	OBJ	8.7.1.2			
16A	SH.2/F-7	2	B	18	GL	MO	C	FE	Q	8.5 2 3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2 3		VR-04	
16B	SH 2/E-3	2	B	18	GL	MO	C	FE	Q	8.5.2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5 2 3		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M241 (SHEETS 1 & 2)

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM (1001)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
18A	SH.2/G-6	2	A	3	GA	MO	O	FE	Q	8.5 2 3			
								ST	Q	8 5 2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
								LJW	OBJ	8.7.1.2			
18B	SH 2/G-4	2	A	3	GA	MO	O	FE	Q	8.5 2 3			
								ST	Q	8 5 2 3	O/C		
								PI	PWT	8 5 2 3		VR-04	
								LJW	OBJ	8.7.1 2			
19	SH.1/B-7	2	B	18	GA	MO	O	FE	Q	8.5.2.3			
								ST	Q	8 5.2.3	C		
								PI	PWT	8 5 2 3		VR-04	
21	SH.1/B-3	2	A	4	GA	MO	C	FE	Q	8.5 2 3			
								ST	Q	8.5.2.3	C		
								PI	PWT	8 5 2.3*		VR-04	8 I 30 & 8.5.2.11
								LX	PBT	8.5.2.11		VR-03	
22A	SH.1/G-8	2	AC	1	RL	SA	C	RT	10Y	8.I.26 3			
								LX	NA	8.I.26 3			RT Verifies
22B	SH.1/F-2	2	AC	1	RL	SA	C	RT	10Y	8.I.26.3			
								LX	NA	8.I.26.3			RT Verifies
23A	SH.1/G-6	2	A	10	GA	MO	C	FE	Q	8.5.2.3			
								ST	Q	8.5 2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
23B	SH.1/G-4	2	A	10	GA	MO	C	FE	Q	8.5 2 3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8 I.30 & 8.7.1.5
								LJ	OBJ	8 7 1 5			
26A	SH.1/G-5	2	A	10	GA	MO	C	FE	Q	8.5.2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
26B	SH.1/G-4	2	A	10	GA	MO	C	FE	Q	8.5 2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8 5.2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M241 (SHEETS 1 & 2)

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM (1001)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
28A	SH.1/F-6	2	A	18	GL	MO	O	FE	Q	8 5 2 3			
								ST	Q	8 5.2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8.I.30 & 8.7.1 5
								LJ	OBJ	8.7.1.5			
28B	SH.1/F-3	2	A	18	GL	MO	O	FE	Q	8.5.2 3			
								ST	Q	8 5.2.3	O/C		
								PI	PWT	8 5 2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7.1.5			
29A	SH.1/E-6	1	A	18	GA	MO	C	FE	CS	8.I.11.3		CS-03	
								ST	CS	8.I.11.3	O/C	CS-03	
								PI	PWT	8.I 11.3*		VR-04	8 I 30 & 8 5.2.7
								LJ	OBJ	8.7 1 5			
								LP	PBT	8 5 2.7		VR-06	
29B	SH.1/F-3	1	A	18	GA	MO	C	FE	CS	8 I.11.4		CS-03	
								ST	CS	8.I.11 4	O/C	CS-03	
								PI	PWT	8.I.11 3*		VR-04	8 I 30 & 8.5.2.7
								LJ	OBJ	8 7.1.5			
								LP	PBT	8 5 2.7		VR-06	
32	SH.1/B-3	2	A	4	GA	MO	C	FE	Q	8.5 2.3			
								ST	Q	8 5.2 3	C		
								PI	PWT	8 5 2.3*		VR-04	8.I.30 & 8.5 2.11
								LX	OBJ	8 5 2.11		VR-03	
33A	SH.1/E-6	1	NA	18	GA	MA	LO	FE	NA	NA	O		Passive (Manual)
								PI	PWT	8 5 2.7		VR-04	8.I.30
33B	SH.1/E-4	1	NA	18	GA	MA	LO	FE	NA	NA	O		Passive (Manual)
								PI	PWT	8.5.2.7		VR-04	8 I 30
34A	SH 1/F-7	2	A	12	GA	MO	C	FE	Q	8 5 2 3			
								ST	Q	8 5 2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
34B	SH.1/F-3	2	A	12	GA	MO	C	FE	Q	8 5 2 3			
								ST	Q	8.5 2.3	O/C		
								PI	PWT	8 5 2.3*		VR-04	8 I.30 & 8.7.1.5
								LJ	OBJ	8 7.1.5			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M241 (SHEETS 1 & 2)

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM (1001)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
36A	SH.1/E-7	2	B	12	GL	MO	C	FE	Q	8.5 2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
36B	SH.1/E-3	2	B	12	GL	MO	C	FE	Q	8 5 2 3			
								ST	Q	8 5 2.3	O/C		
								PI	PWT	8 5 2.3		VR-04	
37A	SH 1/E-7	2	A	6	GL	MO	C	FE	Q	8.5.2.3			
								ST	Q	8.5.2 3	O/C		
								PI	PWT	8 5 2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1 5			
37B	SH.1/E-3	2	A	6	GL	MO	C	FE	Q	8.5 2.3			
								ST	Q	8.5.2.3	O/C		
								PI	PWT	8.5.2.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1 5			
43A	SH.2/E-5	2	B	18	GA	MO	O	FE	Q	8 5 2.3			
								ST	Q	8 5.2.3	O/C		
								PI	PWT	8.5 2.3		VR-04	
43B	SH.2/E-4	2	B	18	GA	MO	O	FE	Q	8.5 2 3			
								ST	Q	8 5 2 3	O/C		
								PI	PWT	8 5 2 3		VR-04	
43C	SH.2/G-5	2	B	18	GA	MO	O	FE	Q	8.5 2.3			
								ST	Q	8.5.2 3	O/C		
								PI	PWT	8 5 2 3		VR-04	
43D	SH 2/G-4	2	B	18	GA	MO	O	FE	Q	8 5 2.3			
								ST	Q	8 5.2.3	O/C		
								PI	PWT	8.5.2.3		VR-04	
44	SH.2/C-5	2	AC	1.5	RL	SA	C	RT	10Y	8 I.26.3			
								LX	NA	8 I.26.3			RT Verifies
47	SH.1/C-5	1	A	20	GA	MO	C	FE	CS	8 I.11 5		CS-01	
								ST	CS	8.I.11.5	C	CS-01	
								PI	PWT	8 I.11.5*		VR-04	8.I.30 & 8.5.2.8
								LJ	OBJ	8.7.1.5			
								LP	PBT	8.5.2 8		VR-06	
50	SH.1/D-5	1	A	20	GA	MO	C	FE	CS	8.I.11.5		CS-01	
								ST	CS	8 I.11 5	C	CS-01	
								PI	PWT	8.I.11.5*		VR-04	8 I 30 & 8.5 2.8
								LJ	OBJ	8.7.1.5			
								LP	PBT	8.5.2.8		VR-06	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M241 (SHEETS 1 & 2)

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM (1001)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
67A	SH.2/D-6	2	C	12	CK	SA	C	OT CT	Q Q	8.5.2 2.1 8 5 2.2.1	O C		
67B	SH.2/D-3	2	C	12	CK	SA	C	OT CT	Q Q	8.5.2.2.2 8 5 2.2.2	O C		
67C	SH.2/F-7	2	C	12	CK	SA	C	OT CT	Q Q	8 5 2.2.1 8.5 2.2.1	O C		
67D	SH.2/F-3	2	C	12	CK	SA	C	OT CT	Q Q	8.5.2.2.2 8 5 2.2.2	O C		
68A	SH.1/E-6	1	AC	18	CK	SA	C	OT CT LP	CMP CMP PBT	8 I 34 8.5.2.7 8.5.2.7	O C	RJ-23 RJ-21 VR-06	NIT
68B	SH.1/E-4	1	AC	18	CK	SA	C	OT CT LP	RI RI PBT	8 I.34 8 5 2 7 8 5.2 7	O C	RJ-23 RJ-21 VR-06	
130	SH.1/E-4	2	C	1/2	CK	SA	C	OT CT	RI RI	8.5.4.17 8.5.4.17	O	RJ-10 RJ-10	
132	SH.1/E-6	2	C	1/2	CK	SA	C	OT CT	RI RI	8 5.4.17 8 5 4 17	O	RJ-10 RJ-10	
362B	SH.2/E-3	2	AC	2	CK	SA	C	OT CT LX	CMP CMP PBT	8 5 2.3 8.5.2.13 8 5 2.13	 C	 RJ-21 VR-03	
363A	SH.2/G-8	2	AC	2	CK	SA	C	OT CT LX	CMP CMP PBT	8.5.2.3 8 5.2.13 8.5.2.13	 C	 RJ-21 VR-03	
515 (10)	SH.1/D-3	2	AC	6	CK	SA	C	NA LJW	NA PBT	NA 8 7.1 2	C		Passive (Maint.)
8004	SH.2/F-6	2	AC	1.5	RL	SA	C	RT LX	10Y NA	8.I.26.3 8.I.26.3			 RT Verifies
8005	SH.2/D-6	2	AC	1.5	RL	SA	C	RT LX	10Y NA	8.I.26.3 8 I 26 3			 RT Verifies
8006	SH.2/D-4	2	AC	1.5	RL	SA	C	RT LX	10Y NA	8 I.26 3 8.I.26 3			 RT Verifies
8007	SH.2/G-4	2	AC	1.5	RL	SA	C	RT LX	10Y NA	8 I 26 3 8 I 26 3			 RT Verifies
8008	SH.2/D-7	2	AC	1	RL	SA	C	RT LX	10Y NA	8.I.26.3 8.I 26 3			 RT Verifies
8009	SH.2/D-3	2	AC	1	RL	SA	C	RT LX	10Y NA	8.I 26 3 8.I 26.3			 RT Verifies

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M242

SYSTEM: CORE SPRAY SYSTEM (1400)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
2A	C-3	2	A	12	GA	HO	C	FE	NA	NA			Passive (Manual)
								LX	PBT	8 5.1 8		VR-03	
2B	B-2	2	A	12	GA	HO	C	FE	NA	NA			Passive (Manual)
								LX	PBT	8.5 1 8		VR-03	
3A	C-5	2	A	18	GA	MO	O	FE	Q	8 5.1.3			
								ST	Q	8.5.1.3	C		
								PI	PWT	8.5.1.3		VR-04	
								LJW	OBJ	8 7.1.2			
3B	B-4	2	A	18	GA	MO	O	FE	Q	8.5 1 3			
								ST	Q	8 5.1 3	C		
								PI	PWT	8 5 1 3		VR-04	
								LJW	OBJ	8 7.1 2			
4A	E-5	2	B	6	GA	MO	C	FE	Q	8 5.1.1			
								ST	Q	8.5.1.1	C		
								PI	PWT	8.5 1.1		VR-04	8.I.30
4B	F-4	2	B	6	GA	MO	C	FE	Q	8 5.1.1			
								ST	Q	8 5.1.1	C		
								PI	PWT	8.5 1.1		VR-04	8.I.30
6A	F-7	1	NA	10	GA	MA	LO	FE	NA	NA	O		Passive (Manual)
								PI	PWT	8 5.1.6		VR-04	8.I.30
6B	G-7	1	NA	10	GA	MA	LO	FE	NA	NA	O		Passive (Manual)
								PI	PWT	8 5.1.6		VR-04	8.I 30
9A	E-7	1	AC	10	CK	SA	C	OT	CMP	8 I.15	O	RJ-14	
								CT	CMP	8.5.1.6	C	RJ-21	
								LP	PBT	8.5.1.6		VR-06	
9B	G-6	1	AC	10	CK	SA	C	OT	CMP	8.I.15	O	RJ-14	
								CT	CMP	8 5.1.6	C	RJ-21	
								LP	PBT	8 5.1 6		VR-06	
13A	D-5	2	C	3	SC	SA	**LO/C	OT	CMP	8.I.37	O		NIT/Disassemble
								CT	CMP	8 I.37	C		NIT/Disassemble
13B	D-3	2	C	3	SC	SA	**LO/C	OT	CMP	8.I.37	O		NIT/Disassemble
								CT	CMP	8.I.37	C		NIT/Disassemble

** Stop Check Valve: Handwheel Position - Locked Open, Normal Disc Position - Closed

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M242

SYSTEM· CORE SPRAY SYSTEM (1400)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
24A	E-5	2	A	10	GA	MO	O	FE	Q	8 5.1.3			
								ST	Q	8.5 1.3	O/C		
								PI	PWT	8 5 1.3*		VR-04	8.I.30 & 8 7.1.5
								LJ	OBJ	8.7.1.5			
24B	G-4	2	A	10	GA	MO	O	FE	Q	8.5.1.3			
								ST	Q	8 5.1.3	O/C		
								PI	PWT	8 5.1.3*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8 7 1.5			
25A	E-6	1	A	10	GA	MO	C	FE	CS	8 I.11.11		CS-03	
								ST	CS	8.I.11.11	O/C	CS-03	
								PI	PWT	8 I 11.11*		VR-04	8 I.30 & 8 5.1.6
								LJ	OBJ	8 7.1 5			
								LP	PBT	8 5 1.6		VR-06	
25B	G-5	1	A	10	GA	MO	C	FE	CS	8 I.11.11		CS-03	
								ST	CS	8.I.11.11	O/C	CS-03	
								PI	PWT	8.I.11.11*		VR-04	8.I 30 & 8.5.1.6
								LJ	OBJ	8.7.1.5			
								LP	PBT	8 5.1.6		VR-06	
28A	D-5	2	AC	2	RL	SA	C	RT	10Y	8.I.26.3			
								LX	NA	8.I 26 3			RT Verifies
28B	F-3	2	AC	2	RL	SA	C	RT	10Y	8.I.26 3			
								LX	NA	8 I 26.3			RT Verifies
31A	F-6	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
31B	F-6	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
35	C-7	2	AC	6	CK	SA	C	OT	RI#	8.5.1 1			
								CT	RI	8.7.1 2	C	RJ-08	3 M.4-112

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M242

SYSTEM: CORE SPRAY SYSTEM (1400)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
36A	D-5	2	C	10	CK	SA	C	OT	CMP	8.I.15*	O	RJ-13	
								CT	CMP	8 5.1.1	C		
36B	D-3	2	C	10	CK	SA	C	OT	CMP	8.I.15*	O	RJ-13	
								CT	CMP	8.5.1.1	C		
212A	E-5	2	AC	2	CK	SA	C	OT	CMP	8 5 1.1			
								CT	CMP	8.5.1.7	C	RJ-21	
								LX	PBT	8.5.1.7		VR-03	
212B	G-3	2	AC	2	CK	SA	C	OT	CMP	8 5.1.1			
								CT	CMP	8.5.1.7	C	RJ-21	
								LX	PBT	8.5.1.7		VR-03	
214	C-7	2	AC	6	CK	SA	AC	OT	RI#	8 5.1.1			
								CT	RI	8.7.1.2	C	RJ-08	3.M.4-112

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M243 (SHEET 1) & M244 (SHEET 1)

SYSTEM. HIGH PRESSURE COOLANT INJECTION (2301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
2300-23 (HO-1)	SH.1/F-3 (M244)	2	B	10	GA	HO	C	NA PI	NA PWT	8.5.4.4 8 5 4 4	O/C	 VR-04	Skid-Mounted
2301-24 (HO-2)	SH.1/F-3 (M244)	2	NA	10	GV	HO	C	NA PI	NA PWT	NA 8 5 4 4		 VR-04	Skid-Mounted 8.I.30
3	SH. 1/E-2 (M243)	2	B	10	GA	MO	C	FE ST PI	Q Q PWT	8.5.4.1 8 5 4.1 8.5.4.4	 O	 VR-04	8 5 4 4 8.5.4.4
4	SH.1/G-6 (M243)	1	A	10	GA	MO	O	FE ST PI LJ	Q Q PWT OBJ	8.5.4.4 8.5.4 4 8 7 1 5 8.7.1.5	 O/C	 VR-04	 8 I 30
5	SH.1/G-5 (M243)	1	A	10	GA	MO	O	FE ST PI LJ	Q Q PWT OBJ	8 5 4.4 8 5 4.4 8.7.1.5 8.7.1.5	 O/C	 VR-04	 8.I.30
6	SH.1/G-3 (M243)	2	B	16	GA	MO	O	FE ST PI	Q Q PWT	8 5 4.4 8.5.4.4 8.5.4.4	 O/C	 VR-04	
7	SH.1/E-6 (M243)	1	AC	14	CK	SA	C	OT CT LP	RI RI PBT	8.I.11.7 8 I.11.7 8.5.4 8	O C	RJ-24 RJ-24 VR-06	
8	SH.1/E-5 (M243)	1	A	14	GA	MO	C	FE ST PI LJ LP	CS CS PWT OBJ PBT	8.I.11.11 8.I.11.11 8.I.11.11* 8.7.1.5 8.5.4.8	 O/C	CS-03 CS-03 VR-04 VR-06	 8 I.30 & 8 5 4.8
9	SH.1/E-5 (M243)	2	B	14	GA	MO	O	PI	PWT	8.I.11.11		VR-04	Passive 8 I.30
10	SH.1/F-5 (M243)	2	B	10	GL	MO	C	FE ST PI	Q Q PWT	8.5.4.4 8.5 4.4 8 5 4 4	 C	 VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M243 (SHEET 1) & M244 (SHEET 1)

SYSTEM: HIGH PRESSURE COOLANT INJECTION (2301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
14	SH.1/E-4 (M243)	2	B	4	GL	MO	C	FE	Q	8.5 4.4			
								ST	Q	8 5.4.4	O/C		
								PI	PWT	8.5.4 4		VR-04	
20	SH.1/G-3 (M243)	2	AC	16	CK	SA	C	OT	CMP	8.5.4.1	O		
								CT	CMP	8.5.4.11	C	RJ-21	
								LX	PBT	8 5 4.11		VR-03	
23	SH.1/F-5 (M244)	2	AC	1	RL	SA	C	RT	10Y	8 I 26 3			
								I X	NA	8 I 26 3			RT Verifies
26	SH.1/F-6 (M243)	2	AC	1	EF	SA	O	O I	RI	8 M 3-2	O	VR-01	
								C I	RI	8 M.3-2	C	VR-01	
								LEF	RI	8.M.3-2		VR-01	
29	SH.1/C-1 (M243)	2	B	1	GL	AO	O	FE	Q	8 5 4 4			
								ST	Q	8 5.4 4	C		
								FS	Q	8 5 4.4	C		
								PI	PWT	8.5.4.4		VR-04	
33	SH.1/A-8 (M243)	2	A	4	GA	MO	O	FE	Q	8 5 4 4			
								ST	Q	8 5 4 4	C		
								PI	PWT	8 5.4.4*		VR-04	8.I.30 & 8.7.1.5
								I J	OBJ	8.7.1.5			
34	SH.1/B-7 (M243)	2	A	4	GA	MO	O	FE	Q	8 5 4 4			
								ST	Q	8 5 4.4	C		
								PI	PWT	8.5.4.4*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
34	SH.1/C-6 (M243)	2	C	2	CK	SA	C	OT	RI	8 5 4.16	O	RJ-09	
								CT	RI	8.7.1.2	C	RJ-08	
35	SH.1/F-3 (M243)	2	B	16	GA	MO	C	FE	Q	8.5.4.4			
								ST	Q	8 5 4.4	O/C		
								PI	PWT	8 5 4 4		VR-04	
36	SH.1/A-6 (M243)	2	A	16	GA	MO	C	FE	Q	8 5.4.4			
								ST	Q	8.5.4.4	O/C		
								PI	PWT	8.5.4 4		VR-04	
								LJW	OBJ	8.7.1 2			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M243 (SHEET 1) & M244 (SHEET 1) SYSTEM: HIGH PRESSURE COOLANT INJECTION (2301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
39	SH.1/A-5	2	C	16	CK	SA	C	OT	CMP	8.I.27	O		Disassemble
	(M243)							CT	CMP	8 I 27	C		Disassemble
40	SH.1/C-5	2	AC	4	CK	SA	C	OT	CMP	8.I.37	O		NIT
	(M243)							CT	CMP	8.7.1.2	C		3 M 4-112
								LJW	OBJ	8.7.1.2			
45	SH.1/C-6	2	AC	20	CK	SA	C	OT	RI#	8.5 4.1	O		
	(M243)							CT	RI	8 7.1.5	C	RJ-08	
								LJ	OBJ	8 7.1.5			
53	SH.1/B-4	2	AC	1	RL	SA	C	RT	10Y	8.I 26 3			
	(M244)							LX	NA	8.I.26 3			RT Verifies
64	SH.1/A-5	2	B	1	GA	AO	C	FE	Q	8.5.4.1 & 4		RJ-07	8.I.11.23
	(M244)							ST	Q	8.5 4.1 & 4	O/C	RJ-07	8.I.11.23
								FS	Q	8 5.4.1 & 4	C	RJ-07	8.I.11.23
								PI	PWT	8 5 4.4		VR-04	8.I.30
68	SH.1/C-3	2	D	16	RD	SA	C	RD	5Y	8.I.26 5			Non-Testable
	(M243)												Replace
74	SH.1/C-6	2	AC	20	SC	SA	**LO/C	OT	RI#	8.5 4.1	O		
	(M243)							CT	RI	8.7.1 5	C	RJ-08	
								LJ	OBJ	8.7.1.5			
75	SH.1/B-5	2	C	4	CK	SA	C	NA	NA	8.5 4.1	O		Skid-Mounted
	(M244)												
76	SH.1/B-5	2	C	2	CK	SA	C	NA	NA	8 5 4.1	O		Skid-Mounted
	(M244)									8.I.31	C		
217	SH.1/C-6	2	AC	2	CK	SA	C	OT	RI	8.5.4.16	O	RJ-09	
	(M243)							CT	RI	8.7.1 2	C	RJ-08	
								LJW	OBJ	8 7.1 2			
218	SH.1/D-6	2	AC	1	CK	SA	C	OT	RI	8 5 4.13	O	RJ-04	
	(M243)							CT	RI	8.7.1.5	C	RJ-04	
								LJ	OBJ	8.7.1.5			
220	SH.1/F-6	2	AC	1	EF	SA	O	OT	RI	8 M 3-2	O	VR-01	
	(M243)							CT	RI	8 M 3-2	C	VR-01	
								LEF	RI	8 M 3-2		VR-01	

** Stop Check Valve: Handwheel Position - Locked Open, Normal Disc Position - Closed
# - Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M243 (SHEET 1) & M244 (SHEET 1)

SYSTEM: HIGH PRESSURE COOLANT INJECTION (2301 & 23)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
232 (23)	SH.1/B-8 (M243)	2	C	3	CK	SA	C	OT	RI	8.5 4.15	O	RJ-05	
								CT	RI	8 5.4.15	C	RJ-05	
233 (23)	SH.1/A-8 (M243)	2	C	3	CK	SA	C	OT	RI	8 5 4 15	O	RJ-05	
								CT	RI	8.5 4.15	C	RJ-05	
9068A	SH.1/C-7 (M243)	2	A	1	GL	SO	C	FE	Q	8.5.4.4			
								ST	Q	8 5.4.4	C		
								FS	Q	8 5 4 4	C		
								PI	PWT	8 5.4 4*		VR-04	8.I.30 & 8.7.1 5
								LJ	OBJ	8.7.1.5			
9068B	SH.1/C-7 (M243)	2	A	1	GL	SO	C	FE	Q	8 5 4 4			
								ST	Q	8 5 4 4	C		
								FS	Q	8.5.4 4	C		
								PI	PWT	8.5.4 4*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7.1.5			
9312	SH.1/C-2 (M243)	2	B	1	GL	AO	C	FE	Q	8 5.4 4			
								ST	Q	8 5.4 4	C		
								FS	Q	8.5.4.4	C		
								PI	PWT	8.5.4.4		VR-04	
9313	SH.1/C-3 (M243)	2	B	1	GL	AO	C	FE	Q	8.5.4.4			
								ST	Q	8.5.4.4	C		
								FS	Q	8.5.4.4	C		
								PI	PWT	8 5.4 4		VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M245 (SHEET 1) & M246 (SHEET 1)

SYSTEM: REACTOR CORE COOLING SYSTEM (1301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
1	SH.1/F-3 (246)	2	B	2	GA	SO	O	NA	NA	8.5 5.1	C		Skid-Mounted
								PI	PWT	8.5.5.1		VR-04	8 I.30
2 (HYD-159)	SH.1/F-4 (246)	2	B	2	GV	HO	O	PI	PWT	8.5.5.1		VR-04	Skid-Mounted 8 I.30
9	SH.1/F-5 (246)	2	D	8	RD	SA	C	RD	5Y	8.I.26.5			Non-Testable Replace
12	SH.1/B-5 (246)	3	B	1	GL	AO	C	FE	Q	8.5.5.4			
								ST	Q	8.5.5.4	C		
								FS	Q	8 5 5 4	C		
								PI	PWT	8.5 5 4		VR-04	
15A	SH.1/G-6 (245)	2	AC	1	EF	SA	O	OT	RI	8.M 3-2	O	VR-01	
								CT	RI	8 M 3-2	C	VR-01	
								LEF	RI	8 M 3-2		VR-01	
15B	SH 1/G-6 (245)	2	AC	1	EF	SA	O	OT	RI	8.M.3-2	O	VR-01	
								CT	RI	8.M 3-2	C	VR-01	
								LEF	RI	8 M 3-2		VR-01	
16	SH.1/F-6 (245)	1	A	3	GA	MO	O	FE	Q	8.5.5.4			
								ST	Q	8 5 5 4	O/C		
								PI	PWT	8 5 5 4*		VR-04	8.I.30 & 8 7.1.5
								LJ	OBJ	8 7 1.5			
17	SH.1/F-5 (245)	1	A	3	GA	MO	O	FE	Q	8 5 5 4			
								ST	Q	8.5.5.4	O/C		
								PI	PWT	8.5.5.4*		VR-04	8.I.30 & 8.7.1.5
								LJ	OBJ	8.7 1.5			
22	SH.1/G-4 (245)	2	B	6	GA	MO	O	FE	Q	8 5 5 4			
								ST	Q	8.5.5.4	O/C		
								PI	PWT	8 5 5.4		VR-04	
23	SH.1/G-4 (245)	2	AC	6	CK	SA	C	OT	CMP	8 5.5.1	O		
								CT	CMP	8 5 5 10	C	RJ-21	
								LX	PBT	8 5 5.10		VR-03	
24	SH.1/B-4 (246)	2	C	1	CK	SA	C	NA	NA	8 5 5 1	O		Skid-Mounted

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M245 (SHEET 1) & M246 (SHEET 1)

SYSTEM: REACTOR CORE COOLING SYSTEM (1301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
25	SH.1/A-6 (245)	2	A	6	GA	MO	C	FE ST PI LJW	Q Q PWT OBJ	8 5 5 4 8.5.5 4 8.5 5.4 8.7.1 2	 O/C 	 VR-04 	
26	SH.1/F-4 (245)	2	B	6	GA	MO	C	FE ST PI	Q Q PWT	8.5 5 4 8.5.5.4 8.5.5.4	 O/C 	 VR-04	
27	SH.1/A-5 (245)	2	C	6	CK	SA	C	OT CT	CMP CMP	8 I 27 8 I 27	O C		Disassemble Disassemble
31	SH.1/G-5 (246)	2	AC	2	RL	SA	C	RT LX	10Y NA	8.I.26 3 8.I.26.3			 RT Verifies
34	SH.1/C-3 (245)	2	B	1	GL	AO	C	FE ST FS PI	Q Q Q PWT	8 5 5 4 8 5 5 4 8.5 5 4 8.5 5 4	 C C 	 VR-04	
40	SH.1/B-5 (245)	2	C	2	CK	SA	C	NA	NA	8.5.5.1	O		Skid-Mounted
41	SH.1/C-6 (245)	2	C	8	CK	SA	C	OT CT	RI# RI	8.5 5.1 8.7.1.2	O C	 RJ-08	
42	SH.1/C-5 (246)	2	AC	1	RL	SA	C	RT LX	10Y NA	8 I.26.3 8.I.26 3			 RT Verifies
47	SH.1/C-5 (245)	2	AC	2	CK	SA	C	OT CT LJW	CMP CMP OBJ	8.I 37 8.7.1.2 8.7.1.2	O C 		NIT 3.M.4-112
48	SH.1/E-5 (245)	2	B	4	GA	MO	O	PI	PWT	8 I 11.11		VR-04	Passive, 8.I.30
49	SH.1/E-6 (245)	1	A	4	GA	MO	C	FE ST PI LJ LP	CS CS PWT OBJ PBT	8 I.11.11 8.I.11.11 8.I.11.11* 8.7.1.5 8.5 5.7	 O/C 	CS-03 CS-03 VR-04 VR-06	 8.I.30 & 8.I.11.11
50	SH.1/E-6 (245)	1	AC	4	CK	SA	C	OT CT LP	RI RI PBT	8 I.11.9 8.I.11.9 8.5 5.7	O C 	RJ-24 RJ-24 VR-06	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M245 (SHEET 1) & M246 (SHEET 1)

SYSTEM: REACTOR CORE COOLING SYSTEM (1301)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
53	SH.1/F-5	2	B	4	GL	MO	C	FE	Q	8.5 5 4			
	(245)							ST	Q	8 5.5 4	C		
								PI	PWT	8.5.5 4		VR-04	
59	SH.1/B-6	2	AC	2	CK	SA	C	OT	RI	8 5 5.12	O	RJ-12	
	(245)							CT	RI	8 7.1 2	C	RJ-08	
								LJW	OBJ	8.7.1.2			
60	SH.1/C-5	2	B	2	GL	MO	C	FE	Q	8.5.5.4			
	(245)							ST	Q	8.5 5 4	O/C		
								PI	PWT	8 5 5 4		VR-04	
61	SH.1/F-3	2	B	3	GA	MO	C	FE	Q	8.5 5 1			8.5 5 4
	(246)							ST	Q	8.5.5.1	O/C		8.5 5 4
								PI	PWT	8.5.5.1		VR-04	8 5 5 4
62	SH.1/C-5	2	B	2	GL	MO	C	FE	Q	8.5 5.4			
	(246)							ST	Q	8 5 5 4	O/C		
								PI	PWT	8 5 5 4		VR-04	
63	SH.1/B-6	2	C	2	CK	SA	C	NA	NA	8.5.5 1	O		Skid-Mounted
	(246)									8.I.31	C		
64	SH.1/B-6	2	AC	8	SC	SA	**LO/C	OT	RI	8 5 5.1	O		
	(245)							CT	RI	8.7.1.2	C	RJ-08	
								LJW	OBJ	8.7.1.2			
70	SH.1/C-3	2	AC	1.5	RL	SA	C	RT	10Y	8 I 26.3			
	(246)							LX	NA	8 I 26 3			RT Verifies
9067	SH.1/C-6	2	C	1	SK	SA	C	NA	NA	8.5.5.12	O		Skid-Mounted
	(245)									8 5 5.1	C		

** Stop Check Valve: Handwheel Position - Locked Open, Normal Disc Position - Closed

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M247

SYSTEM· REACTOR WATER CLEANUP SYSTEM (1201 & 12)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
2	G-7	1	A	6	GA	MO	O	FE ST PI LJ	Q Q PWT OBJ	8 6 5.2 8 6 5 2 8 6 5 2* 8.7.1.5	C	VR-04	8.I.30 & 8.7.1.5
5	G-7	1	A	6	GA	MO	O	FE ST PI LJ	Q Q PWT OBJ	8.6.5 2 8 6 5.2 8 6 5.2* 8.7.1 5	C	VR-04	8 I.30 & 8 7.1.5
80	G-5	1	A	4	GL	MO	O	FE ST PI LJ	Q Q PWT OBJ	8 6 5 2 8.6.5 2 8 6 5.2* 8.7.1 5	C	VR-04	8.I.30 & 8.7.1.5
81	H-7	1	C	4	CK	SA	O	OT CT	RI# RI	8.I 31 8.I 21	C	RJ-16	
85	G-8	1	B	6	GA	MO	O	FE ST PI	Q Q PWT	8 6.5 2 8 6.5.2 8 6.5.2	C	VR-04	
360 (12)	F-7	2	AC	1	EF	SA	O	OT CT LEF	RI RI RI	8 M 3-2 8 M 3-2 8 M 3-2	O C	VR-01 VR-01 VR-01	
361 (12)	F-7	2	AC	1	EF	SA	O	OT CT LEF	RI RI RI	8 M 3-2 8.M 3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M249

SYSTEM: STANDBY LIQUID CONTROL SYSTEM (1101)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
1	C-7	1	NA	1.5	GA	MA	LO	NA PI	NA PWT	NA 8.7.1.2.1	O	 VR-04	Passive (Manual) 8 I.30 & 8 7.1.5
15	C-7	1	AC	1.5	CK	SA	C	OT CT LX	RI RI PBT	8.4 6 8.4.2 2 8 4.2.2	O C	RJ-15 RJ-21 VR-03	
16	D-8	1	AC	1.5	CK	SA	C	OT CT LJ	CMP CMP OBJ	8 4 6 8.7.1.2.1 8.7.1.5	O C	RJ-15 RJ-08	8.7.1.5
43A	E-6	2	AC	1.5	CK	SA	C	OT CT LX	CMP CMP PBT	8 4.1 8 4 2.1 8 4.2.1	O C	 RJ-21 VR-03	
43B	D-6	2	AC	1.5	CK	SA	C	OT CT LX	CMP CMP PBT	8.4.1 8 4.2.1 8.4 2 1	O C	 RJ-21 VR-03	
1105A	E-6	2	C	1	RL	SA	C	RT	10Y	8.I.26 3			
1105B	D-6	2	C	1	RL	SA	C	RT	10Y	8 I 26.3			
1106-A	E-8	2	D	1.5	SH	EX	C	EX	10Y	8.4 6			
1106-B	E-8	2	D	1.5	SH	EX	C	EX	10Y	8 4.6			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: CONTROL ROD DRIVE HYDRAULIC (302)

P&ID: M250 (SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
21A	SH.2/G-3	2	A	1	PG	AO	O	FE	Q	8.3 3			
								ST	Q	8 3.3	O		
								ST	RI	8.M 1-31	C	RJ-17	
								FS	Q	8.3 3			
								PI	PWT	8.3 3		VR-04	
								LX	PBT	8 3 3.2		VR-03	
21B	SH.2/G-7	2	A	1	PG	AO	O	FE	Q	8.3 3			
								ST	Q	8.3.3	O		
								ST	RI	8.M.1-31	C	RJ-17	
								FS	Q	8.3 3			
								PI	PWT	8.3 3		VR-04	
								LX	PBT	8 3.3.2		VR-03	
22A	SH.2/D-4	2	A	2	PG	AO	O	FE	Q	8.3.3			
								ST	Q	8.3 3	O		
								ST	RI	8 M 1-31	C	RJ-17	
								FS	Q	8 3.3			
								PI	PWT	8.3.3		VR-04	
								LX	PBT	8.3 3 2		VR-03	
22B	SH.2/D-7	2	A	2	PG	AO	O	FE	Q	8.3.3			
								ST	Q	8.3 3	O		
								ST	RI	8.M.1-31	C	RJ-17	
								FS	Q	8.3.3			
								PI	PWT	8.3.3		VR-04	
								LX	PBT	8 3.3.2		VR-03	
23A	SH.2/G-3	2	A	1	PG	AO	O	FE	Q	8.3.3			
								ST	Q	8.3.3	O		
								ST	RI	8 M.1-31	C	RJ-17	
								FS	Q	8.3.3			
								PI	PWT	8.3.3		VR-04	
								LX	PBT	8 3 3 2		VR-03	
23B	SH.2/G-7	2	A	1	PG	AO	O	FE	Q	8 3 3			
								ST	Q	8.3.3	O		
								ST	RI	8 M 1-31	C	RJ-17	
								FS	Q	8 3 3			
								PI	PWT	8 3 3		VR-04	
								LX	PBT	8 3.3 2		VR-03	
24A	SH.2/D-4	2	A	2	PG	AO	O	FE	Q	8.3.3			
								ST	Q	8 3.3	O		
								ST	RI	8 M.1-31	C	RJ-17	
								FS	Q	8.3.3			
								PI	PWT	8 3.3		VR-04	
								LX	PBT	8.3.3 2		VR-03	
24B	SH 2/D-7	2	A	2	PG	AO	O	FE	Q	8.3.3			
								ST	Q	8.3.3	O		
								ST	RI	8 M.1-31	C	RJ-17	
								FS	Q	8 3.3			
								PI	PWT	8.3.3		VR-04	
								LX	PBT	8.3 3 2		VR-03	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M250 (SHEET 1)

SYSTEM: CONTROL ROD DRIVE HYDRAULIC UNITS (305)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
114 (EP)	SH.1/H-3	2	C	0 5	CK	SA	C	NA	NA	9.9 & 8.3.3 4*	O C		Skid-Mounted
115 (EP)	SH.1/G-2	2	C	0.5	CK	SA	C	NA	NA	9 9 & 8 I.25	C		Skid-Mounted
120 (EP)	SH.1/H-2	2	B	0.5	SV	SO	C	NA	NA	9.3	NA		Skid-Mounted
121 (EP)	SH.1/H-2	2	B	0.5	SV	SO	C	NA	NA	9 3	NA		Skid-Mounted
122 (EP)	SH.1/H-3	2	B	0 5	SV	SO	C	NA	NA	9.3	NA		Skid-Mounted
123 (EP)	SH.1/H-3	2	B	0 5	SV	SO	C	NA	NA	9.3	NA		Skid-Mounted
126 (EP)	SH.1/G-3	2	B	1	PG	AO	C	NA	NA	9.9	O		Skid-Mounted
127 (EP)	SH.1/H-3	2	B	0.5	PG	AO	C	NA	NA	9.9	O		Skid-Mounted
132 (EP)	SH.1/G-3	2	D	0 5	RD	NA	C	NA	NA	8 I.26 5	C		Skid-Mounted
138 (EP)	SH.1/G-3	2	C	0 5	CK	SA	O	NA	NA	8 I 31 & 8.3 2	C		Skid-Mounted

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M251 (SHEET 1 & SHEET 2)

SYSTEM: RECIRC PUMP INSTRUMENTATION (262)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
25A	SH.1/C-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
25B	SH.2/C-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
26A	SH.1/C-7	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
26B	SH.2/C-7	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
F013A	SH.1/E-6	2	AC	0.75	CK	SA	O	OT	RI#	8 I 31			8.7.1.5
								CT	RI	8.7.1 2.1	C	RJ-03	
								LJ	OBJ	8.7.1.5			
F013B	SH.2/E-6	2	AC	0.75	CK	SA	O	OT	RI#	8.I.31			8.7.1.5
								CT	RI	8.7.1 2.1	C	RJ-03	
								LJ	OBJ	8.7.1.5			
F017A	SH.1/E-7	2	AC	0.75	CK	SA	O	OT	RI#	8.I.31			8.7.1.5
								CT	RI	8.7.1 2.1	C	RJ-03	
								LJ	OBJ	8 7.1.5			
F017B	SH 2/E-7	2	AC	0.75	CK	SA	O	OT	RI#	8 I.31			8.7.1.5
								CT	RI	8 7.1.2.1	C	RJ-03	
								LJ	OBJ	8.7.1.5			

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM. FEEDWATER SYSTEM (6)

P&ID: M252 (SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
58A	SH.2/F-6	1	AC	18	CK	SA	O	OT CT LJ	RI# RI OBJ	9.3 8 7.1.5 8.7.1 5	O C	RJ-02	Note 1
58B	SH.2/E-6	1	AC	18	CK	SA	O	OT CT LJ	RI# RI OBJ	9 3 8.7.1.5 8.7.1 5	O C	RJ-02	Note 1
62A	SH 2/F-7	1	AC	18	CK	SA	O	OT CT LJ	RI# RI OBJ	9 3 8 7.1.5 8 7.1 5	O C	RJ-02	Note 1
62B	SH 2/E-7	1	AC	18	CK	SA	O	OT CT LJ	RI# RI OBJ	9.3 8.7 1.5 8 7.1 5	O C	RJ-02	Note 1

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

NOTE 1: Performed when the Reactor is ≥ 70% rated power.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NITROGEN SUPPLY (9)

P&ID: M252 (SHEET 1)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc Number	Safety Direction	Relief/ Justification	Notes
378	SH.1/A-8	2	A	1	GA	MA	C	FE LJ	NA OBJ	NA 8.7.1.5			Passive (Manual)
379	SH.1/A-8	2	A	1	GA	MA	C	FE LJ	NA OBJ	NA 8.7.1.5			Passive (Manual)

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: REACTOR RECIRCULATION SYSTEM (202)

P&ID: M252 (SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
4A	SH.2/C-5	1	NA	28	GA	MO	O	NA PI	NA PWT	NA 8 I.11.1		 VR-04	Passive
4B	SH.2/A-5	1	NA	28	GA	MO	O	NA PI	NA PWT	NA 8 I.11.2		 VR-04	Passive
5A	SH.2/C-3	1	B	28	GA	MO	O	FE ST PI	RI RI PWT	8.I.11.1 8 I.11.1 8.I 11.1	C	RJ-19 RJ-19 VR-04	
5B	SH.2/A-3	1	B	28	GA	MO	O	FE ST PI	RI RI PWT	8.I.11.2 8 I 11.2 8 I 11 2	C	RJ-19 RJ-19 VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M252 (SHEET 1)

SYSTEM: MN STM ISOL., ADS, & SAFETY RELIEF (203)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
1A	SH.1/G-6	1	A	20	GL	AO	O	FE	CS	8.7 4.4		CS-05	
								ST	CS	8.7.4.4	C	VR-05	
								FS	RI	8.I.11.21	C	RJ-11	
								PI	PWT	8.I.11 21		VR-04	8.M.1-15
								LJ	OBJ	8.7.1 6			
1B	SH.1/E-6	1	A	20	GL	AO	O	FE	CS	8 7.4.4		CS-05	
								ST	CS	8.7 4.4	C	VR-05	
								FS	RI	8 I.11.21	C	RJ-11	
								PI	PWT	8.I 11.21		VR-04	8 M.1-15
								LJ	OBJ	8.7.1 6			
1C	SH.1/D-6	1	A	20	GL	AO	O	FE	CS	8 7.4 4		CS-05	
								ST	CS	8 7.4 4	C	VR-05	
								FS	RI	8.I.11.21	C	RJ-11	
								PI	PWT	8.I.11.21		VR-04	8 M.1-15
								LJ	OBJ	8.7.1 6			
1D	SH.1/B-6	1	A	20	GL	AO	O	FE	CS	8.7.4.4		CS-05	
								ST	CS	8.7.4.4	C	VR-05	
								FS	RI	8.I.11.21	C	RJ-11	
								PI	PWT	8.I.11.21		VR-04	8 M.1-15
								LJ	OBJ	8 7.1 6			
2A	SH.1/G-4	1	A	20	GL	AO	O	FE	CS	8.7 4 4		CS-05	
								ST	CS	8.7 4.4	C	VR-05	
								FS	CS	8.I.11.21	C	CS-05	
								PI	PWT	8.I.11.21		VR-04	8.M 1-15
								LJ	OBJ	8.7.1 6			
2B	SH.1/E-4	1	A	20	GL	AO	O	FE	CS	8.7 4.4		CS-05	
								ST	CS	8.7 4.4	C	VR-05	
								FS	CS	8.I.11.21	C	CS-05	
								PI	PWT	8 I.11.21		VR-04	8.M.1-15
								LJ	OBJ	8.7.1.6			
2C	SH.1/D-4	1	A	20	GL	AO	O	FE	CS	8 7 4.4		CS-05	
								ST	CS	8.7 4.4	C	VR-05	
								FS	CS	8.I.11.21	C	CS-05	
								PI	PWT	8 I.11 21		VR-04	8.M.1-15
								LJ	OBJ	8.7.1.6			
2D	SH.1/B-4	1	A	20	GL	AO	O	FE	CS	8.7.4 4		CS-05	
								ST	CS	8.7.4.4	C	VR-05	
								FS	CS	8.I.11.21	C	CS-05	
								PI	PWT	8 I.11.21		VR-04	8.M.1-15
								LJ	OBJ	8 7.1 6			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: MN STM ISOL , ADS, & SAFETY RELIEF (203)

P&ID: M252 (SHEET 1)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
3A	SH.1/G-7	1	AC	6	RL/ SV	AO/SA	C	FE PI RT LX	5Y 2Y 5Y NA	8 5 6.2 8.5 6 2 8.I 26 2 8.I 26 2			RT Verifies
3B	SH.1/C-7	1	AC	6	RL/ SV	AO/SA	C	FE PI RT LX	5Y 2Y 5Y NA	8 5.6 2 8 5 6.2 8.I 26.2 8.I 26 2			RT Verifies
3C	SH 1/A-7	1	AC	6	RL/ SV	AO/SA	C	FE PI RT LX	5Y 2Y 5Y NA	8.5.6 2 8 5.6 2 8 I 26 2 8 I 26.2			RT Verifies
3D	SH.1/F-7	1	AC	6	RL/ SV	AO/SA	C	FE PI RT LX	5Y 2Y 5Y NA	8.5 6 2 8.5 6 2 8.I 26.2 8 I 26.2			RT Verifies
4A	SH.1/G-7	1	AC	6	SV	SA	C	RT LX	5Y NA	8.I.26.1 8 I.26.1			RT Verifies
4B	SH.1/D-7	1	AC	6	SV	SA	C	RT LX	5Y NA	8.I.26.1 8.I.26 1			RT Verifies

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

P&ID: M252 (SHEET 1 & SHEET 2)

SYSTEM: NUCLEAR BOILER SYSTEM (220)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
1	SH.1/G-5	1	A	3	GA	MO	C	FE ST PI LJ	Q Q PWT OBJ	8.7.4.3 8.7.4 3 8.7 4.3* 8.7.1 5	C	VR-04	8.I.30 & 8.7.1.5
2	SH.1/G-5	1	A	3	GA	MO	C	FE ST PI LJ	Q Q PWT OBJ	8.7.4 3 8.7.4.3 8.7 4 3* 8.7.1.5	C	VR-04	8.I.30 & 8.7.1.5
44	SH 2/D-6	1	A	1	GA	AO	C	FE ST FS PI LJ	Q Q Q PWT OBJ	8.7.4.3 8 7 4.3 8.7.4 3 8 7.4 3* 8 7.1.5	C C	VR-04	8.I.30 & 8.7.1.5
45	SH 2/D-7	1	A	1	GL	AO	C	FE ST FS PI LJ	Q Q Q PWT OBJ	8.7.4.3 8.7.4.3 8.7.4.3 8.7 4.3* 8.7.1.5	C C	VR-04	8.I.30 & 8.7.1.5
46	SH 2/H-3	1	B	1	GL	AO	C	FE ST FS PI	CS CS CS PWT	8.I.11.11 8 I.11.11 8 I.11.11 8 I.11.11	C C	CS-02 CS-02 CS-02 VR-04	
47	SH.2/H-3	1	B	1	GL	AO	C	FE ST FS PI	CS CS CS PWT	8 I 11.11 8 I.11.11 8 I.11.11 8 I 11.11	C C	CS-02 CS-02 CS-02 VR-04	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NUCLEAR BOILER (261)

P&ID: M252 (SHEET 1 & SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
1-17A	SH.1/G-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
1-17B	SH.1/E-4	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
1-17C	SH.1/D-5	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
1-17D	SH.1/B-4	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
1-18A	SH.1/G-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
1-18B	SH.1/E-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
1-18C	SH.1/C-5	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
1-18D	SH.1/B-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
19A	SH.2/D-2	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
19B	SH.2/E-2	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
20A	SH 2/D-2	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
20B	SH.2/E-2	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
21A	SH.2/C-1	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NUCLEAR BOILER (261)

P&ID: M252 (SHEET 1 & SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
21B	SH.2/C-1	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
22A	SH.2/C-1	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
22B	SH.2/C-1	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
67A	SH.2/F-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
67B	SH.2/F-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
67C	SH.2/F-7	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
67D	SH.2/F-7	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
67E	SH.2/G-7	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
67F	SH.2/G-7	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
67G	SH.2/G-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
67H	SH.2/G-7	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
110A	SH.2/C-7	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
110B	SH.2/E-2	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	

SYSTEM: REFERENCE LEG BACKFILL (C220X)

P&ID: M253 (SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
C2205A-1 (INBRD)	SH.2/C-2	2	AC	0.375	CK	SA	O	OT CT LX	RI# RI PBT	8.I.31 8 3.3 3 8.3.3 3	C	SJ-01 SJ-01 VR-03	Series-Pair Series-Pair
C2205A-1 (OUTBRD)	SH.2/C-2	2	AC	0.375	CK	SA	O	OT CT LX	RI# RI PBT	8 I.31 8 3.3.3 8.3 3 3	C	SJ-01 SJ-01 VR-03	Series-Pair Series-Pair
C2206A-1 (INBRD)	SH.2/B-2	2	AC	0.375	CK	SA	O	OT CT LX	RI# RI PBT	8 I.31 8.3 3.3 8.3.3 3	C	SJ-01 SJ-01 VR-03	Series-Pair Series-Pair
C2206A-1 (OUTBRD)	SH 2/B-2	2	AC	0 375	CK	SA	O	OT CT LX	RI# RI PBT	8.I.31 8 3.3 3 8 3.3 3	C	SJ-01 SJ-01 VR-03	Series-Pair Series-Pair

- Denotes a check valve exercise open test or exercise close test that is not refueling outage dependent and may be performed more frequently than once a refueling interval.

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NUCLEAR BOILER VESSEL INSTRUMENTATION (263)

P&ID: M253 (SHEET 1 & SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
2-125A	SH.1/F-6	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-02	
								CT	10Y	8.M.3-2	C	VR-02	
								LEF	10Y	8 M.3-2		VR-02	
2-125B	SH.1/F-3	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-02	
								CT	10Y	8.M.3-2	C	VR-02	
								LEF	10Y	8.M 3-2		VR-02	
38	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
44	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
45	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
51	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
53	SH 2/B-8	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
55	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
57	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
59	SH 2/B-8	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
61	SH 2/B-8	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
69	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
71	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M 3-2			

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NUCLEAR BOILER VESSEL INSTRUMENTATION (263)

P&ID: M253 (SHEET 1 & SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
73	SH 2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
75	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8.M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
77	SH.2/B-8	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
79	SH 2/E-4	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
81	SH.2/E-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M.3-2		VR-01	
83	SH.1/F-6	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8 M 3-2		VR-01	
90	SH.2/E-4	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
92	SH 2/D-4	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
215A	SH.1/F-6	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
215B	SH.1/F-3	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
217A	SH.1/E-6	2	AC	1	EF	SA	O	OT	10Y	8 M.3-2	O	VR-01	
								CT	10Y	8 M 3-2	C	VR-01	
								LEF	10Y	8.M 3-2		VR-01	
217B	SH.1/E-3	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8.M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	
219A	SH.1/E-6	2	AC	1	EF	SA	O	OT	10Y	8 M 3-2	O	VR-01	
								CT	10Y	8 M.3-2	C	VR-01	
								LEF	10Y	8 M.3-2		VR-01	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM: NUCLEAR BOILER VESSEL INSTRUMENTATION (263)

P&ID: M253 (SHEET 1 & SHEET 2)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
219B	SH.1/E-3	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M.3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	
220A	SH.2/D-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M 3-2 8 M 3-2	O C	VR-01 VR-01 VR-01	
220B	SH 2/D-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M.3-2 8.M 3-2	O C	VR-01 VR-01 VR-01	
223A	SH 2/E-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M.3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	
223B	SH.2/E-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8.M 3-2 8.M.3-2 8.M.3-2	O C	VR-01 VR-01 VR-01	
225	SH.2/C-7	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8.M 3-2 8 M.3-2 8.M.3-2	O C	VR-01 VR-01 VR-01	
227	SH.2/C-7	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8.M 3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	
231A	SH.2/B-8	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M 3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	
231B	SH 2/B-8	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8.M 3-2 8.M 3-2 8.M 3-2	O C	VR-01 VR-01 VR-01	
233	SH 2/D-4	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8.M 3-2 8 M.3-2 8 M.3-2	O C	VR-01 VR-01 VR-01	
237	SH.1/E-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M.3-2 8 M 3-2	O C	VR-01 VR-01 VR-01	
242A	SH.1/D-6	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8.M 3-2 8.M 3-2	O C	VR-01 VR-01 VR-01	
242B	SH.1/D-3	2	AC	1	EF	SA	O	OT CT LEF	10Y 10Y 10Y	8 M.3-2 8 M 3-2 8 M 3-2	O C	VR-01 VR-01 VR-01	

TABLE
INSERVICE VALVE TESTING PROGRAM
IST CLASS 1, 2, AND 3 VALVES
PILGRIM NUCLEAR POWER STATION

SYSTEM. TRAVERSING IN-CORE PROBE (45)

P&ID: M1Q-1-5 (VENDOR DRAWING)

Valve Number	P&ID Sh/Coor	IST Class	Valve Cat	Valve Size	Valve Type	Actuator Type	Normal Position	Test Rqmt.	Test Freq	PNPS Proc. Number	Safety Direction	Relief/ Justification	Notes
300A (Ball A)	NA	2	A	0.25	BL	SO	C	NA LJ	NA OBJ	9.6 8 7.1.5	C		Skid-Mounted
300B (Ball B)	NA	2	A	0.25	BL	SO	C	NA LJ	NA OBJ	9 6 8.7.1.5	C		Skid-Mounted
300C (Ball C)	NA	2	A	0.25	BL	SO	C	NA LJ	NA OBJ	9 6 8.7.1.5	C		Skid-Mounted
300D (Ball D)	NA	2	A	0.25	BL	SO	C	NA LJ	NA OBJ	9 6 8 7.1.5	C		Skid-Mounted
N_2 Check	NA	2	AC	0.25	CK	SA	O	NA LJ	NA LJ	3 M.2-5.6 10 8.7.1 5	C		Skid-Mounted
301A (Shear A)	NA	2	D	0.25	SH	EX	O	EX	10Y	3 M 2-5 6.8			Skid-Mounted
301B (Shear B)	NA	2	D	0.25	SH	EX	O	EX	10Y	3.M 2-5 6 8			Skid-Mounted
301C (Shear C)	NA	2	D	0 25	SH	EX	O	EX	10Y	3 M 2-5 6 8			Skid-Mounted
301D (Shear D)	NA	2	D	0.25	SH	EX	O	EX	10Y	3.M 2-5 6.8			Skid-Mounted

7.0 PROGRAM JUSTIFICATIONS AND RELIEF REQUESTS

7.1 PUMP TESTING PROGRAM RELIEF REQUESTS

Pump Relief Requests (PR) are provided for conditions in which compliance to ASME OM Code, Subsection ISTB test requirements cannot practically be satisfied. Each Relief Request identifies: pump(s) involved, test requirement(s) of noncompliance, basis for relief, and alternate testing.

[1] PUMP RELIEF REQUEST PR-01

PUMPS: P-202A, P-202B, P-202C, P-202D, P-202E, P-202F

SYSTEM: Reactor Building Closed Cooling Water (RBCCW)

CLASS: 3

FUNCTION: Emergency Equipment Cooling

TEST REQUIREMENTS: ISTB 5.2.1, Group A Test. Group A tests shall be conducted with the pump operating at a specified reference point. The test parameters shown in Table ISTB 4.1-1 shall be determined and recorded as required by this paragraph. The test shall be conducted as follows.

ISTB 5.2.1(b): For centrifugal and vertical line shaft pumps, the resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value.

RELIEF REQUESTED: Obtain inservice test parameter values with two pumps running in parallel. When plant operating conditions allow scheduled single pump operation, perform the quarterly testing using single pump operation.

BASIS FOR RELIEF: Reactor Building Closed Cooling Water System instrumentation is not configured to measure individual pump flow rates during plant parallel pump operations in a single loop. Pumps in a single loop have only a hand-operated butterfly valve capable of establishing the reference point value (not an acceptable throttling device). Redesign of the system would be necessary to install flow instrumentation, to utilize portable flow instrumentation, or to provide an acceptable throttling device. Piping configuration does not permit installation of flow orifices on the pump discharge piping that would be consistent with good instrument practices. Each RBCCW loop has three pumps. Adequate distance downstream of the elbows is not available on the individual pump discharge prior to where discharge piping joins a common header.

[1] PUMP RELIEF REQUEST PR-01 (CONTINUED)

The Reactor Building Closed Cooling Water System is part of the ultimate heat sink for containment cooling functions and Reactor Vessel shutdown cooling. Test loops do not exist for individual pump flow tests; therefore, disturbance of the system normal configuration during operation (and some cold shutdown conditions) will have a negative impact on the plant's ability to maintain safe steady-state operation.

The Reactor Building Closed Cooling Water pump system flow rates depend on Reactor power, service water temperature, and other climatic conditions. When plant service water heat loads are high and/or salt service water inlet temperature is high (during summer months), parallel pump operation is necessary. These conditions normally occur during the months of June, July, August, and September. Because of these limitations, the RBCCW Group A pump testing will be performed using one of two methods. Scheduled testing during these conditions will be conducted in accordance with ISTB 5.3, Pumps in Regular Use. The Group A testing using parallel pumps will be performed using the same pump configurations (i.e., P-202A/B, P-202A/C, P-202D/E, or P-202D/F) at a known reference point of total flow. The use of parallel pumps allows monitoring both of the pumps' hydraulic and mechanical parameters for degradation.

During periods when plant heat loads and climatic conditions allow the scheduled quarterly testing to be performed using single RBCCW pump operation, the Group A Test Method will be conducted using a single pump at a known flow reference point.

<u>ALTERNATE TESTING</u>: Perform normal quarterly Type A pump testing while parallel pumps are in service. When plant heat loads and climatic conditions allow single pump quarterly testing to be scheduled in advance, the Type A test will be performed using a single pump.

[2] PUMP RELIEF REQUEST PR-02

PUMPS: P-205 (Main/Booster)

SYSTEM: High Pressure Coolant Injection (HPCI)

CLASS: 2

FUNCTION: The HPCI Main and Booster Pumps act as an integral unit to move liquid. The HPCI Main/Booster Pump takes suction from either the Condensate Storage Tank or Torus for makeup to the Reactor Vessel when activated.

TEST REQUIREMENTS: ISTB 4.2, Inservice Testing. Inservice testing of a pump in accordance with this Subsection shall commence when the pump is required to be operable (see paragraph ISTB 1.1).

RELIEF REQUESTED: Test the HPCI Main and Booster Pumps as an integral unit in accordance with ISTB 4.2(b) and ISTB 4.2(c).

BASIS FOR RELIEF: There are no suitable provisions for accurately measuring the pressure in the crossover piping between the HPCI Booster and Main Pumps. Since these pumps are driven by a common driver and are connected in tandem, they are tested together, simultaneously, under the same operating conditions (flow rate and turbine speed). Therefore, measuring the inlet pressure of the booster pump and calculating the differential pressure of the pump combination will effectively verify operability and serve to monitor the performance of the pair.

ALTERNATE TESTING: During inservice testing of these pumps, the differential pressure of the pump combination will be determined from measurements of the suction and discharge pressures of the booster and main pumps, respectively. This data will be used to evaluate the performance of the pump combination in a manner such that the combination will be treated as a single multistage pump.

[3] PUMP RELIEF REQUEST PR-03

PUMPS: P-205 (Main/Booster)

SYSTEM: High Pressure Coolant Injection (HPCI)

CLASS: 2

FUNCTION: Provides emergency core cooling subsequent to a small break LOCA.

TEST REQUIREMENTS: ISTB 5.2.3(d), Vibration (displacement or velocity) shall be determined and compared with corresponding reference values. Vibration measurements are to be broad band (unfiltered). If velocity measurements are used, they shall be peak. If displacement amplitudes are used, they shall be peak-to-peak.

ISTB 5.2.3(e), All deviations from the reference values shall be compared with the ranges of Tables ISTB 5.2.1-1 and ISTB 5.2.3-1 and corrective action taken as specified in paragraph ISTB 6.2. The vibration measurements shall be compared to the relative and absolute criteria shown in the Alert and Required Action Ranges of Table ISTB 5.2.1-1. For example, if vibration exceeds either 6 V_r or 0.7 in./sec, the pump is in the Required Action Range.

RELIEF REQUESTED: PNPS proposes to expand the Acceptable Range and Alert Range identified in Table ISTB 5.2.1-1 during Comprehensive pump testing. In addition, the resonance peaks will be evaluated during each test with an upper limit assigned.

BASIS FOR RELIEF: Historical testing and analysis performed on the HPCI System by PNPS and the pump manufacturer have consistently revealed characteristic pump vibration levels that exceed the acceptance criteria stated in Table ISTB 5.2.1-1. The demonstration of high vibration levels during HPCI pump testing is a common phenomenon in the industry with like or similar design configurations of turbine-driven main and booster pumps. The PNPS HPCI pump exhibits vibration characteristics that have been diagnosed by the vendor (Byron Jackson) as being due primarily to a hydraulic standing wave resonance in the interconnecting piping at the booster pump vane pass frequency (4x RPM) coinciding with structural resonances of the piping and the main pump. This results in high vibration on the main pump bearing housings appearing at approximately 2x RPM in the horizontal direction but caused by the booster pump excitation at 4x RPM of the booster pump. Prior to Byron Jackson's Tech Note on high vibration, it was often misdiagnosed as being caused primarily by misalignment of the turbine to the main pump which would also induce high 2x RPM vibration. The vibration characteristics of the HPCI pump are predominantly a function of the pump design and should be identified as such rather than attributed to pump degradation. The high vibration has been present to the same order of magnitude since the pump was new.

Table ISTB 5.2.1-1 of the OM Code establishes an Alert Range of > $2.5V_r$ to $6V_r$ or > 0.325 to 0.7 in./sec and a Required Action Range of > $6V_r$ or > 0.7 in./sec. In addition, footnote 1 to ISTB 4.4 states "Vibration measurements of pumps may be foundation, driver and piping dependent. Therefore, if initial vibration readings are high and have no obvious relationship to the pump, then vibration measurements should be taken at the driver, at the foundation, and on the piping and analyzed to ensure that the reference vibration measurements are representative of the pump and that the measured vibration levels will not prevent the pump from fulfilling its function."

Assuming that "high" readings include those that exceed 0.7 in./sec peak, it can be shown that the main pump vibration occurring at 4x RPM of the booster pump is not related to the condition of the main pump. The high vibration is caused by hydraulic and structural resonances that are excited by the vane passing frequency at 4x RPM of the booster pump. The actual vibration of interest at the main pump includes only those frequency components generated by the rotor dynamics of the pump itself which include 1/2x, 1x, and 2x RPM, and at the main pump vane passing frequency (5x RPM) and its related harmonics.

If this vibration frequency component at 4x booster pump RPM is subtracted from the main pump vibration spectrum, then the remaining vibration which is attributed to the main pump is below the OM Code Required Action Range. This corrected vibration level provides a more representative measurement of the pump condition to be used for trending.

This method of vibration level correction was applied to historical spectrums. The 4x booster pump RPM component was taken out of the calculation for the main pump overall vibration level. This data shows that when the 4x booster pump RPM component is deleted from the main pump vibration, the level is below the Required Action Range (> 0.7 in./sec) but still within the Alert Range (> 0.325 in./sec).

Although existing vibration levels of the HPCI pump are higher than the acceptance criteria provided in Table ISTB 5.2.1-1, they are acceptable and reflect the unique operating characteristics of the HPCI pump design configuration. It has been concluded that there are no major vibrational concerns that would result in pump degradation or would prevent the HPCI pump from performing its design safety function.

[3] PUMP RELIEF REQUEST PR-03 (CONTINUED)

ALTERNATE TESTING: To allow for practicable monitoring of vibration levels on the HPCI pump, alternate vibration acceptance criteria are required. Full spectrum vibration monitoring will be performed during each biennially comprehensive test utilizing the following criteria.

MAIN PUMP**

Test Parameter	Acceptable Range	Alert Range	Required Action Range
V_v	$\leq 2.5\ V_r$ but not > 0.6 in./sec	> 2.5 V_r to 6 V_r or > 0.6 to 0.7 in./sec	> 6 V_r or > 0.7 in./sec

BOOSTER PUMP**

Test Parameter	Acceptable Range	Alert Range	Required Action Range
V_v	$\leq 2.5\ V_r$ but not > 0.6 in./sec	> 2.5 V_r to 6 V_r or > 0.6 to 0.7 in./sec	> 6 V_r or > 0.7 in./sec

** Note: Frequency spectrum analysis will be performed and discrete peak at 4x booster pump RPM will be removed (using mean-squared subtraction method) from the main pump spectrum overall value. In addition, all other discrete peaks will be evaluated during each test and will have an Acceptable Range upper limit of 1.05 V_r and an Alert Range upper limit 1.3 V_r. The evaluation of these peaks will be applied to both the main and booster pumps.

[4] PUMP RELIEF REQUEST PR-04

PUMPS: P-207A & P-207B

SYSTEM: Standby Liquid Control System (1101)

CLASS: 2

FUNCTION: Provides a method of shutting down the Reactor without use of the control rods.

TEST REQUIREMENTS: ISTB 4.7.1(f) Frequency Response Range. The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump shaft rotational speed to at least 1000 Hz.

RELIEF REQUESTED: Allow frequency response range to exceed the one-third minimum pump shaft rotational speed when the vibration measuring equipment will be 7.0 Hz or less.

BASIS FOR RELIEF: The nominal shaft rotational speed of these pumps is 420 RPM which is equivalent to approximately 7.0 Hz. Based on this frequency and ISTB 4.7.1(f), the required frequency response range of instruments used for measuring SLC pump vibration is from 2.3 Hz to 1000 Hz. Procurement and calibration of instruments to cover this range to the lower extreme (2.3 Hz) are impractical due to the limited number of vendors supplying such equipment and the level of sophistication and cost of the equipment.

These pumps are of a simplified, reciprocating (piston), positive displacement design with rolling element bearings, Model Number TD-60, manufactured by Union Pump Corporation. Union Pump Corp. has performed an evaluation of the pump design and has determined that there are no probable subsynchronous failure modes associated with these pumps under normal operating conditions. Furthermore, there are no known failure mechanisms that would be revealed by vibration at frequencies below that related to shaft speed (7.0 Hz); thus, no useful information is obtained below this frequency nor will indication of pump degradation be masked by instrumentation unable to collect data below this frequency.

The requirement to measure vibration with instruments with response to one-third shaft speed stems from the need to detect oil whip or oil whirl associated with journal bearings. In the case of these pumps, there are no journal bearings to create these phenomena; thus, satisfying the frequency response range criteria would serve no significant purpose. The significant modes of vibration with respect to equipment monitoring are as follows:

1 - Times Crankshaft Speed - An increase in vibration at this frequency may be an indication of rubbing between a single crankshaft cheek and rod end, cavitation at a single valve, or coupling misalignment.

<u>2 - Times Crankshaft Speed</u> - An increase in vibration at this frequency may be an indication of looseness at a single rod bearing or crosshead pin, a loose valve seat in the fluid cylinder, a loose plunger/crosshead stub connection, or coupling misalignment.

<u>Other Multiples of Shaft Speed</u> - An increase in vibration at other frequencies may be indications of cavitation at several valves, looseness at multiple locations, or bearing degradation.

The vibration sensing instruments utilized by PNPS are accelerometers. Accelerometers have a frequency response range which is ideally suited for component operation but inherently have amplitude distortions at low frequencies. While other types of transducers may provide more accurate signals in a lower frequency response range, the advantages of accelerometers (light-weight, rugged, wide frequency response, good temperature resistance, moderate pricing, availability) would outweigh the advantages of having instrumentation that would meet the Code requirements for the SLC pumps. Additionally, as part of the PNPS Preventive Maintenance Program, the SLC pumps are subject to periodic vibration analysis and also receive periodic oil analysis.

Based on the foregoing discussion, it is clear that monitoring pump vibration within the frequency range of 7 to 1000 Hz will provide sufficient information for evaluating pump condition and ensuring continued pump reliability. Compliance with the Code requirement would result in a significant hardship and cost without any compensating increase in pump performance.

<u>ALTERNATE TESTING</u>: Vibration levels of the Standby Liquid Control Pumps will be measured in accordance with the applicable portions of ISTB 4.7.1(f), Frequency Response Range, with the exceptions of the lower frequency response limit for the instrumentation. In this case, the lower response limit of the vibration measuring equipment will be 7 Hz or less.

7.2 VALVE TESTING PROGRAM COLD SHUTDOWN JUSTIFICATIONS

Valve cold shutdown Justifications (CS) are provided for conditions where compliance to ASME OM Code, Subsection ISTC test requirements are satisfied but conditions exist that necessitate a test frequency of "cold shutdown" in lieu of "quarterly". Each justification identifies: valve(s) involved, compliance test requirement(s), basis for justification, and an alternate testing frequency of cold shutdown.

[1] COLD SHUTDOWN JUSTIFICATION CS-01

SYSTEM: Residual Heat Removal System (1001)

VALVES: 47, 50

CATEGORY: A

CLASS: 1

FUNCTION: The 47 and 50 valves are the RHR shutdown cooling suction path primary containment and pressure isolation valves.

TEST REQUIREMENTS: ISTC 4.2.2(b): If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.

ISTC 4.2.2(f): Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in paragraph ISTC 4.2.2(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.

BASIS FOR JUSTIFICATION: The valves are interlocked to prevent opening when Reactor pressure is greater than 70 psig. Each pressure isolation motor operated valve maintains one of the two high pressure barriers during plant operation. To exercise these valves during plant operation would involve a loss of one pressure isolation barrier between the high pressure Reactor coolant system and low pressure RHR system.

ALTERNATE TESTING: Exercise valves during cold shutdown.

[2]

COLD SHUTDOWN JUSTIFICATION CS-02

SYSTEM: Nuclear Boiler - Main Steam, Vent, Drain, & Sampling System (220)

VALVES: 46, 47

CATEGORY: B

CLASS: 1

FUNCTION: These valves are used to vent the Reactor Vessel head and Main Steam Line "A" during startup. During power operation they function as Reactor pressure boundary valves.

TEST REQUIREMENTS: ISTC 4.2.2(b): If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.

ISTC 4.2.2(f): Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in paragraph ISTC 4.2.2(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.

BASIS FOR JUSTIFICATION: Exercising one of these valves during normal operation leaves the other valve as the only barrier between the Reactor Vessel and the Drywell sump. Any seat leakage through the closed valve could potentially pressurize the Drywell, which is an unnecessary risk for the sole purpose of testing a valve. Finally, PNPS operating Procedures prohibit operation of these valves during power operation.

ALTERNATE TESTING: Exercise valves during cold shutdown.

[3]

COLD SHUTDOWN JUSTIFICATION CS-03

SYSTEMS: Residual Heat Removal System (1001)
Core Spray System (1400)
High Pressure Coolant Injection System (2301)
Reactor Core Isolation Cooling System (1301)

VALVES: 1001-29A, 1001-29B, 1400-25A, 1400-25B, 2301-8, 1301-49

CATEGORY: A

CLASS: 1

FUNCTION: These valves provide the pressure isolation function from the high pressure Reactor coolant system.

TEST REQUIREMENTS: ISTC 4.2.2(b): If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.

ISTC 4.2.2(f): Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in paragraph ISTC 4.2.2(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.

BASIS FOR JUSTIFICATION: These pressure isolation motor-operated valves (PIVs) maintain one of the two high to low pressure barriers during plant operation. The other pressure isolation barrier is a check valve. To exercise these valves during plant operation results in a loss of one isolation barrier. Exercising these motor-operated valves quarterly with the Reactor Vessel at pressure significantly increases the occurrence probabilities of an intersystem loss of coolant accident.

ALTERNATE TESTING: Exercise valves during cold shutdown.

[4]

COLD SHUTDOWN JUSTIFICATION CS-04

SYSTEM: Salt Service Water System (29)

VALVES: 3801, 3805

CATEGORY: B

CLASS: 3

FUNCTION: These valves control cooling water flow for each of the Turbine Building Closed Cooling Water (TBCCW) heat exchangers and, therefore, the amount of cooling available for TBCCW equipment. The safety function of these valves is to close on LOCA signal in order to direct maximum cooling water flow to the RBCCW heat exchanger.

TEST REQUIREMENTS: ISTC 4.2.2(b): If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.

ISTC 4.2.2(f): Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in paragraph ISTC 4.2.2(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.

BASIS FOR JUSTIFICATION: Since critical power generation equipment such as the turbine lube oil coolers, Reactor feed pump coolers, and generator hydrogen and stator coolers are serviced by TBCCW, a complete stroke closure of the valves would cause an undesirable disruption of cooling in the system. This cooling disruption could lead to power generation equipment damage and possible plant Scram from the generator protective functions.

ALTERNATE TESTING: Partial stroking of valves quarterly. Exercise valves during cold shutdown.

[5]

COLD SHUTDOWN JUSTIFICATION CS-05

SYSTEM: Main Steam (203)

VALVES: 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D

CATEGORY: A

CLASS: 1

FUNCTION: The Main Steam Isolation Valves (MSIVs) must close to quickly terminate Reactor steam flow to the Turbine Building during specified plant conditions, and/or close to isolate the main steam line (primary containment) penetrations.

TEST REQUIREMENT: ISTC 4.2.2(b): If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.

ISTC 4.2.2(f): Valves full-stroke exercised at cold shutdowns shall be exercised during each cold shutdown, except as specified in paragraph ISTC 4.2.2(g). Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.

BASIS FOR JUSTIFICATION: Full stroke testing [full stroke exercise (FE) and stroke timing (ST)] the MSIVs requires a reduction in power to approximately 60% or less in order to lower main steam line flow to acceptable levels for valve stroking. Attempting to full stroke an MSIV above 60% power may result in a plant trip as the MSIV goes closed due to a steam flow increase through the other (nontested) lines. Conducting power reductions for the purpose of performing MSIV quarterly exercising is costly and burdensome to the utility.

The MSIVs are designed to receive a partial stroke exercise at 100% power. Testing is accomplished by bleeding down the air from the actuator underpiston area (which holds this valve in the open position) and allowing the valve's springs to slowly move the poppet to the 10% closed (90% full open) position. Periodic partial stroke exercising is required by plant Technical Specifications and verifies proper open position indication, limit switch actuation, and fail-safe initiation.

A roller arm limit switch assembly activates the MSIV closed position light for full stroke exercise (FE). This limit switch assembly was not designed to provide precise valve stem position. The PNPS fail-safe closed verification no longer relies upon the closed limit switch mechanism. This is because valve full stroke stem travel may not always be accurately indicated by the activation of the close limit switch mechanism (and light indication).

Performing MSIV full stroke testing on a strict quarterly frequency during power operation will require periodic power reductions for testing, which creates an undue hardship without a compensating increase in the level of quality and safety. Fail-safe "springs-only" testing the outboard MSIVs is initiated by push button manipulation from the Control Room. Each valve's air control system has a special test circuit that enables a closure test to be conducted without using air assist from the valve actuator (closing) over-piston. The Control Room push button actuates a two-way solenoid valve that slowly vents (through a bleedoff port) the valve actuator's underpiston (opening) air supply. Spring force and the (pre-established) air bleedoff rate determine the resulting MSIV closure speed.

NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, Section 4, "Supplemental Guidance on Inservice Testing of Valves", provides guidance related to MSIV fail-safe closure verification. Section 4.2.4, "Main Steam Isolation Valves", endorses the General Electric Co. recommended practice (reference SIL 477) for conducting a "springs only" full stroke closure test and states "by monitoring position indicators alone, the utility could not determine that the valve is fully closed" and that testing "would necessitate measurement of the actual valve stem travel because the final 10-percent of stem travel coincides with the weakest spring force." Because PNPS has adopted the NUREG 1482 recommended practice, fail-safe testing requires: 1) valve access for marking stem position, 2) closure of the MSIV by normal means (which allows full closed stem position marking), and 3) "springs-only" closure verification using the field observed stem position.

To conduct periodic fail-safe testing to the outboard MSIVs (requiring access to the Steam Tunnel) during power operations is not consistent with PNPS ALARA practices. To perform the necessary preparations and obtain the required verifications during valve stroking requires personnel to spend an extended time in the Steam Tunnel during power operation and is beyond the reasonable task scope complexity utilized for quarterly valve stroke testing. Therefore, the outboard MSIVs (AO-203-2A through 2D) will be fail-safe tested at a cold shutdown frequency.

Access restrictions for fail-safe testing of the inboard MSIVs (AO-203-1A through 1D, located within primary containment) differ and are addressed within the appropriate Refuel Outage Justification.

[5] COLD SHUTDOWN JUSTIFICATION CS-05 (CONTINUED)

ALTERNATE TESTING: Perform fail-safe testing of the outboard MSIVs during cold shutdowns.

Perform full stroke exercising and stroke timing of the MSIVs when practical during scheduled plant power reductions (not more frequently than quarterly testing) which are below 60% power. For those cases when full stroke testing cannot practically be conducted during a plant downpower, valve stroking will be attempted again during the next scheduled plant downpower.

Full stroke testing of the MSIVs will also be performed during cold shutdowns when the quarterly test interval has been exceeded.

Partial stroke exercising will be conducted periodically (at least quarterly) as required by plant Technical Specifications.

7.3 VALVE TESTING PROGRAM REFUEL OUTAGE JUSTIFICATIONS

Valve Refuel Outage Justifications (RJ) are provided for conditions in which compliance to ASME OMa Code, Subsection ISTC test requirements are satisfied but conditions exist that necessitate a test frequency of "Refueling Outage" in lieu of "quarterly or cold shutdown". Each justification identifies: valve(s) involved, test requirement(s) of compliance, basis for justification, alternate testing, and frequency of refuel interval.

[1] REFUEL OUTAGE JUSTIFICATION RJ-01

SYSTEM: Reactor Building Closed Cooling Water System (30)

VALVE: 432

CATEGORY: AC

CLASS: 2

FUNCTION: This valve provides isolation to Drywell components that are supplied cooling water from RBCCW. The components would require isolation for primary containment criteria and maintenance.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: This check valve is the outboard primary containment isolation valve for a system considered in-service during plant operation. The exercise open test is performed by verifying system flow during normal operation and may precede or follow the exercise close test.

Performance of a check valve closure test during plant operation would result in the isolation of "A" and "B" Loop Drywell Coolers and "A" and "B" Loop Recirculation Pump Seal Water and Motor Lube Oil Coolers. Isolation of those coolers associated with the recirculation pumps will lead to the accelerated degradation or failure of recirculation pump seals and may damage recirculation pump motors due to overheating. Additionally, isolation of the Drywell coolers during operation would impact the equipment environmental qualification requirements due to Drywell heatup.

Decay heat removal is a key safety function as defined by PNPS during cold shutdown. Due to this concern, PNPS Procedures often require that at least one recirculation pump remains in operation during cold shutdown to compensate for a potential loss of decay heat removal. The required isolation to test valve 30-CK-432 would isolate cooling to both recirculation subsystems causing the same failure concerns addressed above. Additionally, isolation of Drywell coolers during cold shutdown will expose the Drywell to repeated unnecessary heatup with potential to adversely affect component operating life and habitability requirements.

Permanent plant-installed, nonintrusive test equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which can be used to verify an open or close test on this valve require valve closure for extended periods and, as previously stated, are not practical for quarterly or cold shutdown testing.

Seat leak testing (normally performed during a refuel outage) in accordance with 10CFR50 Appendix J ensures the close test and establishes plant conditions to avoid recirculation pump degradation and unnecessary Drywell heatup. During refueling intervals when Appendix J leak testing will not be conducted, the close test will be performed using other methods. The alternate methods will either utilize: 1) leak testing using water to verify valve closure or 2) specialized testing that manipulates system flow and uses portable nonintrusive test equipment to document valve closure.

ALTERNATE TESTING: Perform the exercise close test of this check valve during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[2] REFUEL OUTAGE JUSTIFICATION RJ-02

SYSTEM: Nuclear Boiler - Feedwater System (6)

VALVES: 58A, 58B, 62A, 62B

CATEGORY: AC

CLASS: 2

FUNCTION: These valves serve as feedwater inlet check valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These check valves are the inboard and outboard primary containment isolation valves for a system considered in-service during plant operation. Verification of the closure of these check valves during plant operation would require isolation of all feedwater flow to the vessel (the feedwater trains are crosstied). Such an evolution creates an adverse operating condition which would cause automatic plant shutdown due to loss of feedwater flow.

Performing an exercise close test during cold shutdowns would create prolonged periods of system testing and unreasonable increases in radiation exposure. Permanent plant-installed, nonintrusive test equipment does not exist for verifying disc position of these valves. Other methods using portable test equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which may be used in performing an exercise close test for these check valves during a plant cold shutdown have been reviewed and determined not to be practical. Portable methods require special test equipment to be installed and benchmarked prior to gathering final test data. This benchmarking also necessitates repeated feedwater system startup and shutdown operations which require excessive system manipulation during plant cold shutdown conditions. These alternate testing methods either require extended system testing to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing. Therefore, the only practical method available to verify check valve closure is during the performance of leak testing. Verifying a close test more frequently than that used for seat leak testing would create a hardship without a compensating increase in the level of safety. Leak testing (in accordance with 10CFR50 Appendix J) ensures the valve is in the closed position.

The exercise open test is performed by verifying system feedwater flow during plant operation and may precede or follow the exercise close test (using a leak test).

ALTERNATE TESTING: Perform the exercise close test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[3] REFUEL OUTAGE JUSTIFICATION RJ-03

SYSTEM: Recirculation Pump Seal Water System (262)

VALVES: F013A, F013B, F017A, F017B

CATEGORY: AC

CLASS: 2

FUNCTION: These valves serve as the recirculation pump seal water inboard and outboard containment isolation check valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These check valves are the primary containment isolation valves for a system considered in-service during plant operation. The open function of these valves is non-safety related. The exercise open test is performed by verifying system flow during normal system operation and may precede or follow the exercise close test.

The performance of an exercise close test during plant operation would require isolation of recirculation pump seal purge lines. Operation of the recirculation pumps without seal purge has been shown to lead to accelerated degradation of pump seals. Additionally, leak testing to verify valve closure would require opening a connection on the seal purge line outside of the Drywell. This may introduce air into the seal purge system requiring venting to avoid rapid degradation of recirculation pump seals. Venting of the seal purge line following testing would require Drywell access which is only accessible during cold shutdown.

The required isolation to test these check valves during plant cold shutdowns would result in the isolation of the recirculation seal purge lines, causing the same failure concerns addressed above. Decay heat removal is a key safety function as defined by PNPS during cold shutdown. Due to this concern, PNPS Procedures often require that at least one recirculation pump remains in operation during cold shutdown to compensate for a potential loss of decay heat removal. Permanent, plant-installed, nonintrusive test equipment does not exist for verifying disc position of this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which may be used in testing those check valves associated with the secured recirculation pump have been reviewed for use in performing a close test and have been determined to be not practical. Portable methods require special test equipment to be installed and benchmarked prior to gathering final test data. These alternate testing methods either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

[3] REFUEL OUTAGE JUSTIFICATION RJ-03 (CONTINUED)

Primary containment leak testing or closure verification using a water leak test method each refueling interval constitutes the most prudent method for the exercise close test. The local leak rate tests require system draining and/or venting with entrance into the plant Drywell. Therefore, verifying a close test more frequently than that used for seat leak testing would create a hardship without a compensating increase in the level of safety. Leak testing verifies the valve exercise close test.

ALTERNATE TESTING: Perform the exercise close test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[4] REFUEL OUTAGE JUSTIFICATION RJ-04

SYSTEM: High Pressure Coolant Injection (2301)

VALVE: 218

CATEGORY: C

CLASS: 2

FUNCTION: This is the HPCI exhaust drain pot containment isolation check valve which provides the flow path that allows condensate that collects between the HPCI inboard and outboard exhaust line check valves to drain into the HPCI exhaust line drain pot. This valve provides a containment isolation barrier in the closed position.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: This normally closed valve must be exercise open tested by performing a specialized test. The exercise open test may precede or follow the exercise close test (using leak test methods). Performing this test at power would require isolation of the HPCI turbine for safety reasons. This will require HPCI to be inoperable during preparation, testing, and restoration of this system.

To conduct the exercise open test requires a temporary hydraulic supply established by installing a test hose from the plant demineralized water system to the HPCI exhaust line. Then the highest flow rate achievable through the 3/4" test hose is established to flood up the leg of piping upstream from this check valve. The introduced water then flows through CK-2301-218 and into the HPCI exhaust line drain pot, raising the level in the drain pot and causing the high level alarm to annunciate. The rate of flow is then calculated based on the time lapsed between introducing the water flow into the exhaust line and receiving the drain pot high level alarm. Due to the nature of the piping configuration, occasionally the drain rate into the drain pot becomes impaired due to air binding, preventing this test from providing the desired observed result. For these cases, the HPCI exhaust line piping and the drain pot must be manually vented and drained, and the test rerun to achieve a satisfactory exercise open test.

[4] REFUEL OUTAGE JUSTIFICATION RJ-04 (CONTINUED)

Performing an exercise open test during power operations or cold shutdowns is impractical because it is intrusive and renders the HPCI System inoperable for an extended period of time. To verify this valve open using flow it is necessary to take the HPCI System out of service, set up a special hydraulic test supply, install system vent and drain hoses, perform forward flow testing, drain down the remaining water from the HPCI exhaust line, remove test equipment, and restore the system to operable status. Even during cold shutdowns, to create the system conditions and conduct testing for this check valve, the HPCI System must be made inoperable for an extended period of time such that it could delay returning the plant to power (approximately 8 to 16 hours).

Permanent, plant-installed, nonintrusive test equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which could be used in verifying an open test would still require a temporary test circuit to establish the conditions for conducting the test. Also, because this is a steam line drain line, it is difficult to ensure the drain piping is maintained completely free of air voids during testing, which will render some methods unreliable.

All methods mentioned above for conducting an exercise open test either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise test (includes both open and close tests) during a refueling outage (not to exceed a refueling interval) and complete testing prior to returning the plant to operation.

[5] REFUEL OUTAGE JUSTIFICATION RJ-05

SYSTEM: High Pressure Coolant Injection (23)

VALVES: 232, 233

CATEGORY: C

CLASS: 2

FUNCTION: These valves provide a vent path to relieve the vacuum which is created within the HPCI exhaust line after turbine operation. These valves close to prevent HPCI exhaust steam from bypassing the exhaust steam line submerged pipe header (which provides suppression for the exhaust steam).

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These normally closed valves are exercise open tested by performing a specialized flow test. The exercise close test of each valve is verified concurrently with the exercise open test by performing an air leakage test.

Testing these valves at power requires isolation of the HPCI turbine for safety reasons. This requires HPCI to be inoperable during preparation, testing, and restoration of this system.

To conduct the exercise open test, an air test flow instrument with a pressure gauge is connected to the vacuum breaker system using a test hose and a system vent path is established. Then the desired air flow rate is achieved through these check valves while the test cart air makeup pressure is monitored. The test is satisfactory when a specified rate of flow is established without exceeding a maximum backpressure. To perform the exercise close test of this valve, a leak rate monitor with an installed pressure gauge is connected to the vacuum breaker system using a test hose and a system vent path is established. Two separate air leak rate tests are conducted to ensure that each valve returns to its closed position. These tests are satisfactory when a specified leakage rate which is indicative of full valve closure is achieved.

[5] REFUEL OUTAGE JUSTIFICATION RJ-05 (CONTINUED)

Performing an exercise open test during power operations or cold shutdowns is impractical because it is intrusive and renders the HPCI System inoperable for an extended period of time. To verify this valve open using flow, it is necessary to take the HPCI System out of service, set up special test equipment, establish a vent path, and perform an exercise open test. The system must be then realigned, leak rate test equipment installed, two leak rate tests conducted to verify valve closure, test equipment removed, and the system restored to operable status. Even during cold shutdowns, to create the system conditions and conduct testing for these check valves, the HPCI System must be made inoperable for an extended period of time such that it could delay returning the plant to power.

Permanent, plant-installed, nonintrusive test equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which could be used in verifying an open test would still require a temporary test circuit to establish the conditions for conducting an exercise open test. Also, because this is a vacuum relief line (and contains air), ultrasonic methods for verifying valve movement will not work.

All methods mentioned above for conducting an exercise open test either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise test (both open and close tests) during a refueling outage (not to exceed a refueling interval) and complete testing prior to returning the plant to operation.

[6]

REFUEL OUTAGE JUSTIFICATION RJ-06

<u>SYSTEM:</u> Low Pressure Coolant Injection (1001)

<u>VALVES:</u> 2A, 2B, 2C, 2D

<u>CATEGORY:</u> C

<u>CLASS:</u> 2

<u>FUNCTION:</u> The LPCI Minimum Flow Check Valves open to provide a minimum flow path to prevent pump overheating and damage during low flow conditions. These valves close to prevent backflow through a secured pump when the other pump in the loop is running.

<u>TEST REQUIREMENT:</u> ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

<u>BASIS FOR JUSTIFICATION:</u> These normally closed valves are exercise open tested by performing a specialized nonintrusive test (NIT) while the respective LPCI pump is running. These valves are normally closed, which prevents backflow through a secured pump when the other pump in the loop is running. The exercise close test for these valves can be conducted during quarterly pump testing.

To conduct an exercise open test requires installing an ultrasonic flow meter onto the LPCI minimum flow piping. Then, the respective pump is run while system flow is throttled to maximize pump flow through the minimum flow path. Due to their size and configuration, these minimum flow lines typically experience high flow turbulence that can impair test conduct. This turbulence impacts ultrasonic signal strength and can create gross distortions to the ultrasonic flow readout. Sometimes, more than one test must be run to verify a satisfactory exercise open test.

Performing an exercise open test during power operations or cold shutdowns is impractical because it requires operating the system over an extended period of time to ensure accurate and repeatable results. To verify this valve open using flow, it is necessary to install ultrasonic flow testing sensors, perform setup programming, vent the LPCI System prior to surveillance conduct, establish system conditions to obtain a satisfactory ultrasonic zeroing benchmark, run the LPCI System and manipulate minimum flow rates for the exercise open test, review the results for acceptance (and rerun the testing process as necessary to obtain conclusive data), return the LPCI System to normal, remove ultrasonic test sensors and equipment, and perform independent system verifications for operability. Even during cold shutdowns, to perform preparations, create system conditions, conduct testing, and perform restorations for this check valve test will tie up the LPCI System for an extended period of time such that it could delay returning the plant to power.

Permanent, plant-installed, nonintrusive test equipment does not exist for this system. The alternative method of using portable ultrasonic test equipment which is used to verify an open test requires a lengthy period for setup, test conduct, acceptance, and restoration. All other methods considered for conducting an open test either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

For check valves that are periodically verified through NIT techniques as being exercised, a sample plan may be employed. When using NIT techniques in a sample plan, the guidelines within NUREG 1482 Section 4.1.2 must be adhered to.

[7] REFUEL OUTAGE JUSTIFICATION RJ-07

SYSTEM: High Pressure Coolant Injection (2301)

VALVE: 64

CATEGORY: B

CLASS: 2

FUNCTION: This valve opens to create a flow path that enables condensate from the HPCI Gland Seal Condenser (GSC) to be pumped to Clean Radwaste when the HPCI System is in standby mode. This valve isolates while HPCI is in operation to prevent the HPCI GSC pump discharge piping from communicating with Clean Radwaste.

TEST REQUIREMENT: ISTC 4.2.2(d): If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns and full-stroke during refueling outages.

ISTC 4.2.2(e): If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC 4.2.2(h): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: This air-operated valve opens to create a flow path that enables condensate from the HPCI Gland Seal Condenser (GSC) to be pumped to Clean Radwaste when the HPCI System is in standby mode. This valve isolates while HPCI is in operation to prevent the HPCI GSC pump discharge piping from communicating with Clean Radwaste.

This normally closed valve cannot be stroked when either of the following isolating conditions is present: 1) isolation signal when the HPCI System is initiated either manually or through an automatic signal or 2) isolating condition when HPCI GSC level is below the HPCI GSC pump low level permissive setpoint. If either of the above conditions occurs, then this valve will not respond to handswitch operation.

[7] REFUEL OUTAGE JUSTIFICATION RJ-07 (CONTINUED)

On some occasions immediately following a HPCI pump run, there is sufficient level in the GSC to permit valve stroke testing. However, if the GSC pump begins to pump down within 2 to 3 minutes before the HPCI pump is tripped or while the HPCI System is being secured following pump trip, then the GSC low level permissive will not be clear and the valve cannot be stroked using the control switch. In this case, valve stroking may not be possible for extended periods of time. Restarting HPCI to obtain another chance for valve stroking would place undue wear and tear on the HPCI turbine/pump system and would be burdensome.

A review of plant on-line computer data for the GSC system shows that when the HPCI System is in the standby mode a low level permissive may not clear for weeks or months to allow stroking the AO-2301-64 valve. This is due to zero or very low steam leakage past the HPCI steam admission valve (a new design valve was installed during RFO #10 which greatly diminished steam leakage).

Testing this valve on a quarterly basis would cause an undue hardship. To conduct a full stroke exercise (FE) and stroke time (ST) consistently on a quarterly basis, one of the following measures will need to be implemented: 1) water must be manually introduced into the HPCI GSC shell side by installing a temporary hose that supplies water from either the HPCI pump suction (using CST static head pressure) or the plant demineralized water system or 2) the low GSC water level permissive that prevents stoking this valve using the control switch must be defeated by installing an electrical jumper.

Stroking the AO-2301-64 valve on a strict quarterly frequency during power operation will require conduct of one of the above listed special provisions and renders the HPCI System inoperable for an extended period of time (several hours). Even during cold shutdowns, to create the system conditions and conduct testing of the air-operated valve, the HPCI System must be made inoperable for an extended period of time such that it could delay returning the plant to power. To create the conditions that will allow stroke testing quarterly or during cold shutdown is burdensome and creates an undue hardship without a compensating increase in the level of quality and safety.

ALTERNATE TESTING: Attempt to perform stroke timing for this valve immediately following each quarterly IST HPCI pump test. For those cases when this valve does not stroke following the HPCI quarterly pump test, valve stroke timing will be attempted again during the next scheduled HPCI pump run(s). If valve stroke timing exceeds the quarterly frequency, then conduct valve stroking on a refueling interval frequency and complete testing prior to returning the plant to operation.

[8] REFUEL OUTAGE JUSTIFICATION RJ-08

SYSTEM: As Applicable

VALVES: Containment Isolation Check valves requiring exercise close test as listed within this justification.

CATEGORY: AC

CLASS: 1, 2, and 3

FUNCTION: These valves are required to return to their normally closed position to perform their function or minimize seat leakage for containment isolation purposes.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These check valves are required to return to their normal closed position to perform their function and/or limit seat leakage for primary containment isolation. Obtaining a satisfactory seat leakage test (normally performed during a refuel outage) ensures that each valve's obturator has returned to the normal closed position. Attempting to verify their closed position by "other positive means" or by performing seat leakage tests on a quarterly or cold shutdown basis is not practical and would place undue hardship on the plant.

Permanent, plant-installed, nonintrusive test equipment does not exist for verifying disc position for any of these listed valves. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which may be used in performing a closure verification on a quarterly or cold shutdown frequency have been reviewed and determined to be not practical. Portable methods require special test equipment to be installed and benchmarked prior to gathering final test data. These alternate testing methods either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for quarterly or cold shutdown testing.

Seat leak testing (normally performed during a refuel outage) in accordance with 10CFR50 Appendix J will be used to verify the normal closed position of these valves. During refueling intervals when Appendix J leak testing will not be conducted, the closure verification will be performed using other methods. The alternate methods will either utilize: 1) leak testing using water or air to verify valve closure or 2) specialized testing that manipulates system flow and uses portable nonintrusive test equipment to document valve closure. These valves are tabulated as part of this justification with a brief explanation of the unique hardship or impracticality of testing.

ALTERNATE TESTING: Perform the exercise close test of these check valves during a refueling outage (not to exceed a refueling interval) and complete testing prior to returning the plant to operation.

Valve No.(s)	Description
9-CK-340 9-CK-341	These valves are the inboard containment isolation valves (Type C tested) for the Drywell and Torus Nitrogen Makeup System. This makeup system is part of the Primary Containment Atmospheric Control System and ensures a source of nitrogen to maintain the inerted condition of containment. These valves are exercised periodically in the open direction. The most practical method of the exercise close test is during an Appendix J seat leakage test or simplified closure test which also measures seat leakage. These tests require isolating the line to this penetration (which would make Containment Atmospheric Dilution System components unavailable) and installing test equipment. Therefore, testing to verify normal closed position more frequently than once each refueling interval results in a hardship and is not practicable due to an increase in personnel radiation exposure, loss of system availability, and manpower constraints.
31-CK-434	This is an inboard containment isolation valve (Type C tested) in the air/nitrogen line which supplies a remote air-operated exerciser for exercising the Torus to Reactor Building Vacuum Breakers. This check valve is opened quarterly during vacuum breaker testing. The only practical method of the exercise close test is during an Appendix J seat leakage or simplified closure test which also measures seat leakage. These tests require climbing to the top of the Torus to allow valve lineup and test equipment installation. This location is a high radiation area and difficult to access. Testing to verify closed position more frequently than once each refueling interval results in a hardship and is not practicable because of the increase in personnel radiation exposure and the safety risks associated with working on top of the Torus.

Valve No.(s)	Description
31-CK-167	The exercise close test can only be performed by entering the containment (Drywell) environment, isolating components supplied by Drywell instrument air, and performing a closure test using leak test methods. Drywell components which will be isolated include: inboard MSIVs and Main Steam Relief Valve Accumulators, equipment and floor drain sump instruments, and Drywell air-operated valves (i.e., Reactor head vent, Reactor sampling, and Reactor seal drain). To conduct an exercise close test other than during a refueling interval would result in a hardship and is not practicable due to excessive Drywell component isolation and an increase in personal radiation exposure.
CK-1101-16	This valve is part of the Reactor Coolant pressure boundary for the Standby Liquid (reactivity) Control (SLC) System. This check valve performs a containment isolation function and forms the Code Class break between Class 1 and Class 2 SLC piping. A seat leakage test or a closure test using seat leak methods is the most practical method for verifying the normally closed position. Because conducting an exercise open test requires initiating the SLC System and injecting into the Reactor Vessel (refer to RJ-16), nonintrusive methods to verify closure can only be conducted infrequently (once each refuel outage). Therefore, verifying the exercise close test more frequently than once per refueling interval would create a hardship without a compensating increase in the level of safety.
CK-2301-45 CK-2301-74	These valves are containment isolation valves (Type C tested) between the HPCI turbine exhaust header and the suppression pool (Torus). The most practical method available to verify each valve's exercise close test is to perform an Appendix J seat leakage test or closure verification using leak test methods. This testing requires erection of scaffolding, isolation of the penetration, and installation of test equipment. Verifying the closed position more frequently than once each refueling interval would be a hardship and is not practicable due to increased personnel radiation exposure and prolonged periods of safety system inoperability.

Valve No.(s)	Description
CK-1400-35* CK-1400-214* CK-1301-41* CK-1301-59 CK-1301-64 CK-2301-34* CK-2301-217	These valves are water-tested containment isolation valves for the Core and Suppression Pool Cooling and Reactor Vessel Level Makeup systems. These valves require testing to assure that the seal-water (Torus) fluid inventory is sufficient to maintain the sealing function for at least 30 days. The most practical method available to verify each valve's exercise close test is to perform an Appendix J seat leakage test or closure verification using water leak test methods. Testing requires isolating the penetration, in some cases the erection of scaffolding, and installation of test equipment. Testing often requires personnel to enter high radiation areas. Verifying the closed position more frequently than once each refueling interval would be a hardship without any compensating increase in the level of safety due to increased personnel radiation exposure and prolonged periods of safety system inoperability. The asterisked (*) valves are not required to be designated category "AC", but their exercise close test is normally performed (using leak test methods) in conjunction with the other valve seat leakage tests.

[9] REFUEL OUTAGE JUSTIFICATION RJ-09

SYSTEM: High Pressure Coolant Injection System (2301)

VALVES: 34, 217

CATEGORY: C and AC

CLASS: 2

FUNCTION: These check valves are the HPCI Turbine Exhaust Drain Line Check Valves. They open to allow the Turbine exhaust drain system condensate to be directed via steam traps to the Torus. These valves close to prevent Torus water backflow during Torus accident pressurization when HPCI is not in operation.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These normally closed check valves (installed in series) are exercise open tested by the performance of a specialized flow test. The exercise close test is verified once per refueling interval by using seat leakage test methods.

Performing this test at power requires isolation of the HPCI turbine for personnel safety reasons. This requires HPCI to be inoperable during preparation, testing, and restoration of this system.

To conduct the exercise open test, a water flow rate monitor with an installed test gauge is connected to the HPCI Exhaust Drain Line using a test hose. The exercise open test is achieved by observing flow through both check valves to the Torus.

Performing an exercise open test during power operation or cold shutdowns is impractical because it is intrusive and renders the HPCI System inoperable for an extended period of time. To verify these valves open using flow, it is necessary to take the HPCI System out of service, set up a flow meter with a hydraulic test supply, install the test flow meter, perform an exercise open test and restore the system to operable status. Even during cold shutdowns, to create the system conditions and conduct testing for this check valve exercise, the HPCI System must be made inoperable for an extended period of time (approximately 10 to 12 hours) such that it could delay returning the plant to power.

Permanent, plant-installed, nonintrusive test equipment does not exist for these valves. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which could be used in verifying an open test would still require a temporary test circuit to establish the conditions for conducting an open test. Also, because this is a steam exhaust drain line, it is difficult to ensure the drain piping is completely free of air voids during testing, which will render some methods unreliable.

All methods mentioned above for conducting an exercise open test require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[10] REFUEL OUTAGE JUSTIFICATION RJ-10

SYSTEM: Residual Heat Removal System (1001)

VALVES: 130, 132

CATEGORY: C

CLASS: 2

FUNCTION: Each check valve opens to provide a pressure equalizing function (caused by fluid thermal expansion) for their respective RHR/LPCI injection motor operated gate valve (MO-1001-29A & MO-1001-29B). The check valves relieve pressure buildup which protects the normally closed gate valve from a pressure locking or thermal binding condition during certain system heatup and cooldown evolutions.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These normally closed check valves are OM Code exercise tested (both open and close tests) by performing a specialized test. This is because MO-1001-29A and MO-1001-29B are both Reactor pressure isolation and containment isolation valves. This testing should not be performed at power due to containment integrity and personnel safety reasons.

To conduct the OM Code exercise test (both open and close tests) for these valves, a leak rate monitor with an installed pressure gauge is connected to the equalizing line using a test hose and a system vent path is established. The exercise open test is conducted by establishing the acceptance flow rate through the check valve. Then, through valve manipulation and test equipment realignment, an exercise close test is performed by using seat leakage test methods, the test equipment is removed, and the loop is restored to operable status following system venting, valve realignment, and proper verifications.

Performing an exercise open test during cold shutdowns is impractical because it is intrusive and may render the RHR/LPCI Injection Loop inoperable for an extended period of time. To verify the valve open using flow, it is necessary to take the RHR/LPCI Injection Loop out of service, set up special test equipment, establish a vent path, and perform the forward flow testing. Then, the system must be realigned, leak rate test equipment installed, a leak rate test conducted to verify valve closure, and test equipment removed. Finally, the loop is restored to operable status following proper system venting. Even during cold shutdowns, to create the system conditions and conduct the check valve OM Code exercise test (both open and close tests), the RHR/LPCI Injection Loop must be made inoperable for an extended period of time such that it could delay returning the plant to power.

Permanent, plant-installed, nonintrusive test equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiograph) which could be used to verify these test parameters would still require a temporary test circuit to establish the conditions for conducting OM Code exercise testing (both open and close tests).

All methods mentioned above for conducting OM Code exercise testing (both open and close tests) require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise test (both open and close tests) during a refueling outage (not to exceed a refueling interval) and complete testing prior to returning the plant to operation.

[11] REFUEL OUTAGE JUSTIFICATION RJ-11

SYSTEM: Main Steam (203)

VALVES: 1A, 1B, 1C, 1D

CATEGORY: A

CLASS: 1

FUNCTION: The Inboard Main Steam Isolation Valves (MSIVs) are used to isolate the main steam line penetrations.

TEST REQUIREMENT: ISTC 4.2.6, Fail-Safe Valves. Valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency of paragraph ISTC 4.2.1.

BASIS FOR JUSTIFICATION: Fail-safe "springs-only" testing of the inboard MSIVs is initiated by push button (switch) manipulation from the Control Room. Each valve's air control system has a special test circuit that enables a closure test to be conducted without using air assist from the valve's over-piston (closing) actuator. The Control Room push button actuates a two-way solenoid valve that slowly vents (through a bleedoff port) the valve actuator's underpiston (opening) air supply. Spring force and the (pre-established) air bleedoff rate determine the resulting MSIV closure speed.

A roller arm limit switch assembly activates the MSIV closed position light for full stroke exercise (FE). This limit switch assembly was not designed to provide precise valve stem position. The PNPS fail-safe closed verification no longer relies upon the closed limit switch mechanism. This is because valve full stroke stem travel may not always be accurately indicated by the activation of the close limit switch mechanism (and light indication).

NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, Section 4, "Supplemental Guidance on Inservice Testing of Valves", provides guidance related to MSIV fail-safe closure verification. Section 4.2.4, "Main Steam Isolation Valves", endorses the General Electric Co. recommended practice (reference SIL 477) for conducting a "springs only" full stroke closure test and states "by monitoring position indicators alone, the utility could not determine that the valve is fully closed" and that testing "would necessitate measurement of the actual valve stem travel because the final 10-percent of stem travel coincides with the weakest spring force." Because PNPS has adopted the NUREG 1482 recommended practice, fail-safe testing requires: 1) valve access for marking stem position, 2) closure of the MSIV by normal means (which allows full closed stem position marking), and 3) "springs-only" closure verification using the field observed stem position.

[11] REFUEL OUTAGE JUSTIFICATION RJ-11 (CONTINUED)

The inboard MSIVs are located in the Drywell (primary containment) and are not accessible during normal plant operations. The Drywell is normally inerted with nitrogen during power operations and often remains de-inerted during plant cold shutdowns. The de-inerted Drywell is considered a hazardous environment from a personnel safety perspective. Therefore, the inboard MSIVs (AO-203-1A through 1D) will be fail-safe tested at a cold shutdown frequency when the Drywell is de-inerted.

ALTERNATE TESTING: Perform fail-safe tests of the inboard MSIVs on a cold shutdown frequency (when Drywell is de-inerted) or during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[12] REFUEL OUTAGE JUSTIFICATION RJ-12

SYSTEM: Reactor Core Isolation Cooling System (1301)

VALVES: 59

CATEGORY: C

CLASS: 2

FUNCTION: This valve is the inboard RCIC Vacuum Pump Discharge Check Valve. The valve opens to allow the vacuum pump to discharge air and noncondensable gases from the RCIC (Barometric Condenser) Vacuum Tank to the Torus. This valve closes to prevent Torus water backflow into the RCIC Vacuum Tank during Torus (accident conditions) pressurization.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: This normally closed valve must be exercise open tested by performing a specialized flow test and the exercise close test is conducted by performing an air leakage test.

This testing during normal operation or cold shutdown would cause undue hardship. Performing these tests at power would require isolation of the RCIC turbine for safety reasons. This will require RCIC to be inoperable during preparation, testing, and restoration of this system.

To conduct the exercise open test, an air test flow instrument with a pressure gauge is connected to the vacuum pump exhaust line using a test hose and a system vent path to the Torus is verified. Then the desired air flow rate is achieved through the check valve while the test cart air makeup pressure is monitored. The test is satisfactory when a specified rate of flow is established without exceeding a maximum backpressure.

Performing an exercise open test during power operations or cold shutdowns is impractical because it is intrusive and renders the RCIC System inoperable for an extended period of time. To verify this valve open using flow, it is necessary to take the RCIC System out of service, set up special test equipment, establish a vent path, and perform exercise open testing. Then the system must be realigned, test equipment removed, and the system restored to operable status. Even during cold shutdowns, to create the system conditions and conduct testing for this check valve exercise open test, the RCIC System must be made inoperable for an extended period of time such that it could delay returning the plant to power.

Permanent, plant-installed, nonintrusive test (NIT) equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which could be used in verifying an open test would still require a temporary test circuit to establish the conditions for conducting an open test. To obtain access to this valve to install test equipment for NIT requires scaffolding to be built. Also, because this is a vacuum pump exhaust line (contains air and noncondensables), ultrasonic methods for verifying valve movement will not work.

All methods mentioned above for conducting an exercise open test either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise open test of this check valve during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[13] REFUEL OUTAGE JUSTIFICATION RJ-13

SYSTEM: Core Spray System (1400)

VALVES: 36A, 36B

CATEGORY: C

CLASS: 2

FUNCTION: These valves are the Core Spray Pump Discharge Check Valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These normally closed valves must be exercise open tested by conducting a specialized nonintrusive test (NIT) or during a flow test that injects water into the Reactor Vessel via the Core Spray System. These valves are normally closed, which maintains system keepfill pressure by preventing backflow through the secured pump. These valves must open to allow Core Spray injection flow to the Reactor Vessel. The exercise close test is conducted during the quarterly pump test.

Testing these valves during normal operation by measuring system flow would require injecting cold water into the Reactor Vessel using the Low Pressure Core Spray System. The Core Spray Pumps cannot provide sufficient head to inject into the Reactor Vessel during normal operation. Valve testing using flow during cold shutdown could cause a thermal shock to the Reactor Vessel and spray sparger when the vessel metal temperature is greater than 212°F.

The suppression pool is the Core Spray System's water source. Injection of suppression pool water into the Reactor Vessel during cold shutdown results in exceeding the EPRI Water Chemistry Guidelines which PNPS has adopted to preclude the initiation and propagation of intergranular stress corrosion cracking in Reactor coolant stainless steel components. The chemistry of the suppression pool water (typical conductivity of 4 to 5 μmho/cm) does not meet the chemical requirements of the Reactor coolant (typical conductivity of 0.15 to 0.3 μmho/cm). Restart of the Reactor is not permitted until the Reactor coolant water chemistry is within the EPRI Guidelines.

The exercise open test of the pump discharge check valves using flow requires Reactor Vessel level control out of the normal parameters and a bleed and feed of the Core Spray System to improve water quality prior to testing. Performing an exercise open test using flow during power operations or cold shutdowns is impractical because of the previously stated reasons.

Permanent, plant-installed, nonintrusive test equipment does not exist for either loop of the Core Spray System. The alternative method of using portable diagnostic test equipment which is used to verify an exercise open test requires a lengthy period for setup, test conduct, acceptance, and restoration. All other methods considered for conducting an exercise open test either require extended system outages to perform and/or cannot consistently provide accurate, reliable results when utilized within the time constraints necessary for cold shutdown testing.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[14] REFUEL OUTAGE JUSTIFICATION RJ-14

SYSTEM: Core Spray System (1400)

VALVES: 9A, 9B

CATEGORY: AC

CLASS: 1

FUNCTION: These valves are the Core Spray Injection Pressure Isolation Check Valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: Testing these valves during normal operation would require injecting cold water into the Reactor Vessel using the Core Spray System. This would result in both a reactivity excursion and thermal shock to the Reactor Vessel and spray sparger. Testing these valves during cold shutdown could cause a thermal shock to the Reactor Vessel when the vessel metal temperature is greater than 212°F.

The suppression pool is the Core Spray System's water source. Injection of suppression pool water into the Reactor Vessel during cold shutdown results in exceeding the EPRI Water Chemistry Guidelines which PNPS has adopted to preclude the initiation and propagation of intergranular stress corrosion cracking in Reactor coolant stainless steel components. The chemistry of the suppression pool water (typical conductivity of 4 to 5 μmho/cm) does not meet the chemical requirements of the Reactor coolant (typical conductivity of 0.15 to 0.3 μmho/cm). Restart of the Reactor is not permitted until the Reactor coolant water chemistry is within the EPRI Guidelines.

In addition, the amount of water that is injected into the vessel during the test of only one of the Core Spray injection check valves results in significant vessel level increase and may cause a vessel isolation. This would extend the length of a shutdown since the only means of water removal from the Reactor is via the Reactor Water Cleanup System line to the condenser.

[14] REFUEL OUTAGE JUSTIFICATION RJ-14 (CONTINUED)

The exercise open test of the injection check valves will require Reactor Vessel level control out of the normal parameter and a bleed and feed of the Core Spray System to improve water quality prior to testing.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[15] REFUEL OUTAGE JUSTIFICATION RJ-15

SYSTEM: Standby Liquid Control System (1101)

VALVES: 15, 16

CATEGORY: AC

CLASS: 1

FUNCTION: These valves are the SLC injection check valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: To verify forward flow during normal operation or cold shutdown would require firing a squib valve and injecting water into the Reactor Vessel using the SLC pumps. Injecting water during operation could result in adverse plant conditions such as changes in reactivity, power transient, thermal shock-induced cracking, and possible plant trip. Injecting water during a cold shutdown can result in cyclical thermal shock-induced cracking as cold water enters the Reactor Vessel, which is at an elevated temperature due to decay heat.

Injection of the SLC System during cold shutdowns using demineralized water requires a lengthy flushing operation to remove boron from the system. Even after extensive flushing, boron remains present in system dead legs. Some of this boron propagates into the Reactor Vessel during injection and is difficult to remove from the system. The presence of boron in Reactor water impedes the plant ability to achieve criticality for plant startup.

Verify the exercise open test during refueling while performing the Standby Liquid Control System injection test, which requires pumping demineralized water into the Reactor Vessel after firing at least one squib valve.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[16] REFUEL OUTAGE JUSTIFICATION RJ-16

SYSTEM: Reactor Water Cleanup System (1201)

VALVE: 81

CATEGORY: C

CLASS: 1

FUNCTION: This valve provides the path for RWCU return flow to the Reactor Vessel.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: The Reactor Water Cleanup return check valve shall be exercise close tested. This normally open check valve is verified in the closed direction by isolating the RWCU return header, pressurizing the feedwater header, and venting the piping on the upstream side of this check valve to verify restricted flow. Controlled pressurization of the feedwater header to perform this test occurs during hydrodynamic leakage testing of the RCIC pressure isolation valves each refueling interval.

During cold shutdown conditions, this system is required to be operable in order to control Reactor water level and primary system chemistry. Pressurization of the feedwater header for hydrodynamic leak testing requires extensive valve alignment to the feedwater system and renders both the feedwater and RWCU Systems inoperable for an extended period of time.

ALTERNATE TESTING: Perform the exercise close test of this check valve during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[17] REFUEL OUTAGE JUSTIFICATION RJ-17

SYSTEM: Control Rod Drive Hydraulic System (302)

VALVES: 21A, 21B, 22A, 22B, 23A, 23B, 24A, 24B

CATEGORY: A

CLASS: 2

FUNCTION: These valves close to isolate Reactor coolant flow past the control rod drive seals during a Scram condition. They open to drain the Scram Discharge Volume Tank and allow a Scram condition to be reset.

TEST REQUIREMENT: ISTC 4.2.2(d): If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns and full-stroke during refueling outages.

ISTC 4.2.2(e): If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC 4.2.2(h): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These air-operated valves are stroked closed quarterly using a separate testing air vent (bleed) circuit. Stroke times using the test circuit can only verify the valve's closed exercise since the closing stroke times are very erratic. Timing of the valve's close stroke using the test circuit quarterly provides meaningless data for tracking valve performance. The only method available to close stroke-time these valves is by initiating a Reactor Scram. Trending these valves in the closed direction by Scramming the Reactor quarterly is impractical. Valve open stroke times are measured and trended quarterly to monitor for valve degradation.

Once per refueling outage, in accordance with Technical Specifications, a full Reactor Scram is initiated which utilizes the normal vent circuit for these valves. Since the Technical Specifications surveillance requirement is being satisfied, then the test frequency assures that the necessary quality of systems and components is maintained, that facility operation will be within the safety limits, and that the limiting condition for operation will be met.

ALTERNATE TESTING: Measure close stroke times by inserting a full Reactor Scram in accordance with Technical Specifications during a refueling outage not to exceed a refueling interval.

[18] REFUEL OUTAGE JUSTIFICATION RJ-18

SYSTEM: Reactor Building Closed Cooling Water System (30)

VALVES: 4009A, 4009B, 4002

CATEGORIES: A, B

CLASSES: 2, 3

FUNCTION: These valves provide isolation to Drywell components cooled by RBCCW. The components would require isolation for primary containment criteria and maintenance.

TEST REQUIREMENTS: ISTC 4.2.2(d): If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns and full-stroke during refueling outages.

ISTC 4.2.2(e): If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC 4.2.2(h): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: The testing of these valves requires isolation of the following components: Drywell Area Coolers, Reactor Recirculation Pump Seal Coolers, Reactor Recirculation Pump Lube Oil Coolers. Additionally, for testing 4009A and 4009B, the Reactor Water Cleanup (RWCU) non-regenerative heat exchanger, B Fuel Pool Cooling Heat Exchanger, RWCU Pump Cooling System Coolers, Control Rod Drive (CRD) Pump Area Cooling, and CRD Pump Thrust Bearing Coolers must also be isolated. The listed components supply numerous plant systems required for safe plant operation. The recirculation pumps and Drywell coolers may be required to support the plant during cold shutdown conditions to prevent water stratification in the vicinity of Reactor Vessel lower head and overheating of Drywell components.

Exercising these valves quarterly during power operation is impractical because the resulting flow interruption could cause equipment damage. It also is impractical to exercise these valves during cold shutdown when Drywell cooling loads are high or when a Reactor recirculation pump is operating. Stopping of Reactor recirculation pumps during each cold shutdown to allow exercising these valves could result in extending the cold shutdown, which would be costly and burdensome to the plant.

ALTERNATE TESTING: Exercise valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[19] REFUEL OUTAGE JUSTIFICATION RJ-19

SYSTEM: Nuclear Boiler - Reactor Recirculation System (202)

VALVES: 5A, 5B

CATEGORY: B

CLASS: 1

FUNCTION: These valves are the Reactor recirculation pump discharge valves and function to close upon LOCA signals. (This is the remaining function of LPCI Loop Selection Logic.)

TEST REQUIREMENTS: ISTC 4.2.2(d): If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns and full-stroke during refueling outages.

ISTC 4.2.2(e): If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC 4.2.2(h): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: Closure of these valves during normal operation will result in loss of forced circulation to the Reactor, prohibited by PNPS license.

Closure of these valves during cold shutdown necessitates securing operation of the Reactor recirculation pumps. This is detrimental because even though the moderator temperature is less than 212°F, the recirculating system is usually kept in operation during cold shutdown to provide Reactor coolant mixing to prevent Reactor Vessel temperature stratification. The Reactor Vessel temperature profile takes on an increasing temperature gradient between the bottom vessel head and the shutdown core when mixing (forced circulation) is stopped. Additionally, the water in the idle recirculation loops cools down. This stratification can have the following adverse effects: Reactor Vessel temperatures become greater between the vessel bottom and top resulting in unnecessary thermal cycling, startup of the shutdown recirculation pump can cause a cold water intrusion affecting Reactor Vessel metal temperatures. Deliberate stopping and starting of the recirculation pumps 1) creates unnecessary cycling wear on major equipment important to plant reliability and 2) could result in extending the shutdown, both of which would be costly and burdensome to the plant. Therefore, performing this testing on a cold shutdown or quarterly frequency is not practicable.

ALTERNATE TESTING: Exercise valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[20] REFUEL OUTAGE JUSTIFICATION RJ-20

SYSTEM: Reactor Building Closed Cooling Water (30)

VALVES: 4085A, 4085B

CATEGORY: B

CLASS: 3

FUNCTION: Valves 4085A and 4085B are RBCCW Loop A Isolation valves in supply lines to non-safety related components.

TEST REQUIREMENTS: ISTC 4.2.2(d): If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns and full-stroke during refueling outages.

ISTC 4.2.2(e): If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.

ISTC 4.2.2(h): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: Valves 4085A and 4085B are the non-safety related component isolation valves for RBCCW Loop A. Components cooled by this RBCCW branch include the Reactor recirculation pump motor-generator set fluid coupling oil and bearing coolers.

Stroke testing quarterly during power operation could result in loss of cooling to the recirculation pump motor-generator set fluid coupling oil and bearing coolers with consequent loss of forced circulation to the Reactor, requiring plant shutdown.

Stroke testing at cold shutdown could result in loss of the recirculation pump operation due to interruption of cooling to the recirculation pump motor-generator set fluid coupling oil and bearing coolers. This is detrimental because even though the moderator temperature is less than 212°F, the recirculation system is kept in operation during cold shutdown to provide mixing of the Reactor coolant to prevent Reactor Vessel temperature stratification.

[20] REFUEL OUTAGE JUSTIFICATION RJ-20 (CONTINUED)

The Reactor Vessel temperature profile takes on an increasing temperature gradient between the bottom vessel head and the core when mixing (forced circulation) is stopped, plus the water in the idle recirculation loops cools down. This stratification can have the following adverse effect: Reactor Vessel metal temperature differences become greater between Reactor Vessel bottom and top resulting in unwanted thermal cycling. Startup of the shutdown recirculation pumps causes a cold water intrusion which affects Reactor Vessel metal temperatures and causes thermal cycling of the Reactor Vessel.

ALTERNATE TESTING: Exercise valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[21] REFUEL OUTAGE JUSTIFICATION RJ-21

SYSTEM: As Applicable

VALVES: Check valves, except Containment Isolation Check Valves, requiring seat leakage measurement for the performance of the closed test are as listed within this justification.

CATEGORY: AC

CLASS: 1, 2, and 3

FUNCTION: These valves are required to return to their normally closed position to minimize seat leakage.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These check valves are required to return to their normal closed position to perform a safety function and limit seat leakage to a specific amount. Conducting a satisfactory seat leakage measurement assures the valve's obturator has returned to the normal closed position. Permanent, plant-installed, nonintrusive test equipment does not exist for verifying disc position for any of these listed valves. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which may be used in performing a closure verification on a quarterly or cold shutdown frequency have been reviewed and determined to be not practical. Portable methods require special test equipment to be installed and benchmarked prior to gathering final test data. These alternate testing methods either require extended system outages to perform and/or cannot consistently provide accurate reliable results when utilized within the time constraints necessary for quarterly or cold shutdown testing.

Therefore, attempting to verify the closed position by other positive means or by performance of seat leakage tests on a quarterly or cold shutdown basis is not practical and would place undue hardship on the plant. These valves are tabulated as part of this relief with a brief explanation of the unique hardship or impracticality of testing.

ALTERNATE TESTING: Perform the exercise close test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

Valve No.(s)	Description
CK-1001-68A/B CK-1400-9A/B	These valves are part of the Reactor coolant pressure boundary for the Core and Suppression Pool Cooling and Reactor Vessel Level Makeup systems. Each valve performs a pressure isolation function between the Reactor coolant pressure boundary and the associated low pressure system. A seat leakage test is the only practical method for verifying the normally closed position. Testing these valves requires entry into the Drywell (e.g., Drywell must be de-inerted) for system isolation, installation of test equipment, and sometimes partial draindown of the system. Therefore, verifying the exercise close more frequently than the interval used for seat leakage testing would create a hardship and is not practicable due to an increase in personnel radiation exposure and prolonged periods of safety system inoperability.
CK-1101-15	This valve is part of the Reactor coolant pressure boundary for the Standby Liquid (reactivity) Control (SLC) System. This check valve maintains the Reactor coolant pressure boundary for this high pressure system. A seat leakage test is the only practical method for verifying the normally closed position. Since there is no test connection upstream from this valve to enable pressurization, the closed position can only be practically verified by performing a leakage test during the Class 1 Reactor Pressure Vessel System Leakage Test. This system leakage test is only conducted near the end of each refueling outage. Because this valve is located inside the Drywell and conducting an exercise requires initiating the SLC System and injecting into the Reactor Vessel nonintrusive test methods for verifying valve closure are not practical. Therefore, verifying the exercise close test more frequently than the interval used for leakage testing would create a hardship without a compensating increase in the level of safety.
CK-1001-362B CK-1001-363A CK-1400-212A CK-1400-212B	These valves are the seismic boundary isolation between the Core Spray or LPCI suppression pool cooling systems and their keepfill supplies. Loss of keepfill for maintenance or testing creates a potential for air intrusion which would jeopardize the affected cooling system's operability. The only reasonable method to verify the valves' exercise close is by performing a seat leakage test. Leak testing of these valves requires isolation of the keepfill supply and entry into a radiation area to install test equipment and conduct testing. Therefore, verifying the closed position more frequently than the interval used for the seat leak testing would be a hardship and is not practicable due to increased personnel radiation exposure and prolonging the duration of a safety system's inoperability.

Valve No.(s)	Description
CK-1101-43A/B	These valves are the Standby Liquid Control (SLC) pumps discharge check valves and prevent possible backflow through the idle parallel SLC train. The only practical method for verifying their closed position is during a seat leakage test. This testing requires isolation of both SLC trains and removal of a pump discharge relief valve to establish a vent path. Therefore, verifying the closed position more frequently than that used for seat leakage testing creates a hardship and is not practicable due to prolonged periods of safety system inoperability.
CK-1301-23 CK-2301-20	These valves are Condensate Storage Tank (CST) water supply check valves for Reactor Core Isolation Cooling (RCIC) and High Pressure Coolant Injection (HPCI) Systems. The function of these normally closed check valves is to 1) open to supply the normal suction path for each system and 2) close to prevent backflow during system automatic swap to an alternate (Torus water) suction path. This closing prevents suppression pool water from being directed to the CST when the Torus is pressurized during severe accident conditions. The only practical method available to verify each valve's close position is during seat leakage testing. This testing requires isolating both suction paths and installing test equipment which renders the systems inoperable for an extended period of time. Therefore, verifying the exercise close test more frequently than that used for seat leakage testing would be a hardship and is not practicable due to prolonged periods of safety system inoperability.

[22] REFUEL OUTAGE JUSTIFICATION RJ-22

SYSTEM: Reactor Building Closed Cooling Water (30)

VALVES: 419, 420, 421, 422, 423, 424

CATEGORY: C

CLASS: 3

FUNCTION: These normally open check valves are the pump discharge check valves which, when open, allow proper coolant flow and, when closed, prevent diversion of flow and reverse pump rotation.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: During plant operation these normally open check valves can be exercise close tested during quarterly pump testing. Because of each system's large cooling loads and lack of installed instrumentation, individual pump flow rates cannot be obtained. This deviation is identified by pump Relief Request PR-01 with an alternate testing criteria of measuring a total flow rate using parallel pumps. The individual check valve OM Code exercise test (both open and close tests) will be performed during the individual pump test when practical, but not to exceed a refueling interval basis. Therefore, verifying the OM Code exercise open test quarterly or during each plant cold shutdown for these check valves may (at times) be impractical and would place an undue hardship on the facility.

ALTERNATE TESTING: Perform the exercise open test during a refueling outage (not to exceed a refueling interval) or when plant conditions allow individual pump testing. Complete testing prior to returning the plant to operation.

[23] REFUEL OUTAGE JUSTIFICATION RJ-23

SYSTEM: Residual Heat Removal System (1001)

VALVES: 68A, 68B

CATEGORY: AC

CLASS: 1

FUNCTION: These valves are the Low Pressure Coolant Injection (LPCI) pressure isolation check valves which provide a flow path for Shutdown Cooling.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: These check valves are the pressure isolation valves for the Low Coolant Injection (LPCI) System and remain closed during normal plant operation. Each valve is an integral part of its respective RHR Shutdown Cooling loop flow path. One loop of RHR Shutdown Cooling is necessary for decay heat removal during a cold shutdown.

PNPS practice is to select an RHR Shutdown Cooling loop on a staggered basis each shutdown and remain exclusively in the selected loop for shutdown duration, unless changing plant conditions or maintenance activities necessitate shifting to the other loop. Swapping from one RHR loop to another creates a "higher risk evolution" because of 1) excessive manpower loading, 2) deviations from normal system configurations, 3) complexity of this task (i.e., high susceptibility to events causing the loss of key safety functions), and 4) large dose accumulations.

This method of devoting one loop to Shutdown Cooling for the shutdown duration is supported by the conclusions of NUMARC 91-06, Guidelines For Industry Actions to Assess Shutdown Management. This document references numerous NRC IENs and IEBs in which a loss of "key safety functions" (i.e., decay heat removal capability and inventory control) has occurred during "higher risk evolutions". Because of task complexity, swapping RHR Shutdown Cooling loops for the purpose of partial exercising these injection check valves creates a high risk evolution and should be avoided. For the case of mid-cycle and refueling outages, plant conditions/activities usually require swapping from one RHR loop to the other.

[23] REFUEL OUTAGE JUSTIFICATION RJ-23 (CONTINUED)

Exercise open testing an injection check valve at the maximum required accident flow rate is only obtainable by operating three RHR pumps. Normal plant limitations do not allow the operation of more than two RHR pumps within a loop. An exercise open test can be verified by performing diagnostic testing while two pumps pass flow through a Shutdown Cooling loop. This testing requires entry into primary containment (Drywell) and operation of special test equipment in a high radiation area.

Performing diagnostic nonintrusive monitoring of these valves on a refueling interval demonstrates that the full-stroke capability of each valve is acceptable.

ALTERNATE TESTING: Perform the exercise open test of these check valves during a refueling outage not to exceed a refueling interval and complete testing prior to returning the plant to operation.

[24] REFUEL OUTAGE JUSTIFICATION RJ-24

SYSTEMS: High Pressure Coolant Injection System (2301)
Reactor Core Isolation Cooling System (1301)

VALVES: 2301-7, 1301-50

CATEGORY: AC

CLASS: 1

FUNCTION: These valves are the HPCI and RCIC injection pressure isolation check valves.

TEST REQUIREMENT: ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

BASIS FOR JUSTIFICATION: Testing these valves during normal operation would require: 1) injecting cold water into the Reactor Vessel using the HPCI (or RCIC) System which would result in both a reactivity excursion and thermal shock to the feedwater nozzle and piping and 2) loss of one pressure isolation barrier between the high pressure Reactor coolant system and low pressure HPCI (or RCIC) System.

Performing the OM Code exercise test (both open or close tests) during cold shutdowns is prohibited due to differential pressure experienced across the valve disc. Additionally, access to the valve's exerciser adapter requires construction of temporary scaffolding (personal safety concern) thus increasing the testing duration.

These check valves are manually stroke testable. Since a maximum allowable torque on the mechanical test lever of 120 ft-lb for valve 2301-7 and 75 ft-lb for valve 1301-50 are specified by the manufacturer to prevent damage, the exercise open test is performed by use of the manual exerciser and applying normal force to move the obturator from the close seat to the full open position.

The exercise close test is conducted by repositioning the manual exerciser releasing obturator allowing the disc to move to the close seat. The valve disc weight and gravity return the obturator to the closed position. The manual exerciser is then positioned to the neutral position ensuring that the exerciser does not interfere with valve operational readiness.

[24] REFUEL OUTAGE JUSTIFICATION RJ-24 (CONTINUED)

Permanent, plant-installed, nonintrusive test equipment does not exist for this valve. Other methods using portable equipment (e.g., acoustic, ultrasonic, magnetic, and radiography) which can be used to verify an open or close test on this valve require valve cycling and, as previously stated, are not practical for quarterly or cold shutdown testing.

ALTERNATE TESTING: Perform the exercise test (both open and close tests) during a refueling outage (not to exceed a refueling interval) and complete testing prior to returning the plant to operation.

7.4 VALVE DISASSEMBLY EXAMINATION JUSTIFICATIONS

Valve Disassembly Examination Justifications are provided for conditions in which compliance to ASME OMa Code, Subsection ISTC test requirements exist that make it impractical to demonstrate the check valve exercise open or close test. Check valve obturator movement will be verified by a sample disassembly examination program. Each justification identifies: the valve(s) involved, basis for justification, and alternate testing.

[1] DISASSEMBLY EXAMINATION JUSTIFICATION DJ-01

SYSTEM: As Applicable

VALVES: As Applicable

CATEGORIES: C, AC

CLASS: 1, 2, and 3

FUNCTION: All check valves whose ability to fully open or close cannot be verified without disassembly.

TEST REQUIREMENT: ISTC 4.5.4(c): If the test methods in ISTC 4.5.4(a) and ISTC 4.5.4(b) are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly examination program shall be used to verify valve obturator movement. If maintenance is performed on one of these valves that could affect its performance, the postmaintenance testing shall be conducted in accordance with ISTC 4.5.4(c)(4).

BASIS FOR JUSTIFICATION: These check valves cannot be exercise open tested and/or exercise close tested or have their obturator movement verified because sufficient flow cannot be achieved or verified. System design inhibits the verification of full open position during flow testing or closure by other means due to system configuration or limitations. These valves will be placed in a check valve disassembly program complying with the guidelines of ISTC 4.5.4. These check valves are identified in two tables that provide the justification for disassembly with the associated retests. The two tables are: Table 1 - Disassembly to Satisfy OM Code Exercise Test (Both Open and Close Tests) and Table 2 - Disassembly to Satisfy the Exercise Open Test. Other check valves, which require a disassembly to verify operability, may be incorporated into this program as long as the alternate testing guidelines are followed. Currently, no check valves have been placed into the Disassembly Examination Program.

ALTERNATE TESTING: The sample disassembly examination program shall group check valves of similar design, application, and service condition and require a periodic examination of one valve from each group. The sample program shall comply with ISTC 4.5.4(c)(1) through ISTC 4.5.4(c)(4).

TABLE 1
DISASSEMBLY TO SATISFY OM CODE EXERCISE TEST (BOTH OPEN AND CLOSE TESTS)

NONE

TABLE 2
DISASSEMBLY TO SATISFY THE EXERCISE OPEN TEST

NONE

7.5 VALVE SERIES PAIR JUSTIFICATIONS

Valve Series Pair Justifications are provided for conditions in which compliance to ASME OMa Code, Subsection ISTC test requirements exist that make it impractical to demonstrate the check valve exercise open or close test. Each justification identifies: the valve(s) involved, basis for justification, and alternate testing.

[1] SERIES PAIR JUSTIFICATION SJ-01

SYSTEM: Nuclear Boiler Vessel Instrumentation (263)

VALVES: CK-C2205A-1 (Inboard), CK-C2205A-1 (Outboard), CK-C2206A-1 (Inboard), CK-C2206A-1 (Outboard)

CATEGORY: AC

CLASS: 2

FUNCTION: These valves open to allow CRD charging water to be supplied to each of the two Emergency Core Cooling System water level reference legs. These valves also close to ensure stable operation of the Reactor water level instrumentation upon loss of the CRD Charging Water System by preventing reverse flow from the instrument racks from migrating back into the CRD System.

TEST REQUIREMENT: ISTC 4.5.7 Series Valve Pairs. If two check valves are in a series configuration without provisions to verify individual reverse flow closure (e.g., keepfill pressurization valves) and the plant safety analysis assumes closure of either valve (but not both), then the valve pair may be operationally tested closed as a unit. If the plant safety analysis assumes that a specific valve or both valves of the pair close to perform the safety functions), the required valve(s) shall be tested to demonstrate individual valve closure.

ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

ISTC 4.5.8 Corrective Action. Series valve pairs tested as a unit in accordance with paragraph ISTC 4.5.7 that fail to prevent reverse flow shall be declared inoperable and both valves shall be either repaired or replaced.

[1] SERIES PAIR JUSTIFICATION SJ-01 (CONTINUED)

BASIS FOR JUSTIFICATION:

These are the supply check valves for the Reactor water level reference leg purge system, which is required to be placed into service periodically (i.e., once every 30 days) during plant operation. These check valves are configured in series without provisions to verify individual reverse flow closure. The safety function for these valves is to close and isolate the reference leg purge system from the CRD System. The most practical way to perform the exercise close test is to conduct a seat leakage test which requires isolating CRD flow to the water level reference legs. Conducting a leak test also requires breaching the system boundary and installation of test equipment for system pressurization and vent path. Isolating and breaching the Reactor water level purge system during power operation or plant cold shutdowns can negatively impact this system's function by creating a condition that allows the potential for air to be introduced into these reference legs.

Other methods (e.g., acoustics, ultrasonics, magnetics, and radiography) have been reviewed for performing a close test of these valves during cold shutdowns; however, they have been determined not practical. These alternate methods either require extended system outage time for testing and/or cannot consistently provide reliable test results due to the small size of these valves (0.375 inch with Swagelok fittings).

Therefore, verifying the OM Code exercise test (both open and close tests) will be during a refueling outage.

ALTERNATE TESTING:

Perform the OM Code exercise test (both open and close tests) during the seat leakage test each refueling interval.

7.6 VALVE TESTING PROGRAM RELIEF REQUESTS

Valve Relief Requests (VR) are provided for conditions in which compliance to ASME OMa Code, Subsection ISTC test requirements cannot practically be satisfied. Each relief request identifies: the valve(s) involved, test requirements(s) of noncompliance, basis for relief, and alternate testing.

[1] VALVE RELIEF REQUEST VR-01

SYSTEMS: Core Spray System (1400)
High Pressure Coolant Injection System (2301)
Reactor Core Isolation Cooling System (1301)
Reactor Water Cleanup System (1201)
Recirculation Pump Instrumentation (262)
Nuclear Boiler Instrumentation (261)
Nuclear Boiler Instrumentation (263)

VALVES: Excess Flow Check Valves manufactured by Chemequip:

1-CK-17A/B/C/D	262-26A/B	263-79
1-CK-18A/B/C/D	263-38	263-81
12-CK-360	263-44	263-83
12-CK-361	263-45	263-90
1400-31A/B	263-51	263-92
1301-15A/B	263-53	263-215A/B
2301-26	263-55	263-217A/B
2301-220	263-57	263-219A/B
261-19A/B	263-59	263-220A/B
261-20A/B	263-61	263-223A/B
261-21A/B	263-69	263-225
261-22A/B	263-71	263-227
261-67A/B/C/D/E/F/G/H	263-73	263-231A/B
261-110A/B	263-75	263-233
262-25A/B	263-77	263-237
		263-242A/B

CATEGORY: AC

CLASS: 1, 2

FUNCTION: Excess Flow Check Valves (EFCVs) are installed within each instrument process line that is part of the Reactor coolant pressure boundary and that penetrates primary containment. Each EFCV closes to limit flow within the respective instrument line in the event of an instrument line break downstream of the EFCV.

TEST REQUIREMENT: ASME OM Code Subsection ISTC Paragraph 4.5.1 requires these valves to be tested nominally every 3 months, except as specified by Paragraph ISTC 4.5.2. The PNPS IST Program takes exception to the testing requirements in accordance with subparagraphs ISTC 4.5.2(c) and ISTC 4.5.2 (f).

ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

ISTC 4.3.3(a) Frequency. Tests shall be conducted at least once every 2 years.

RELIEF REQUESTED: Relaxation of the number of EFCVs tested every refuel outage from "each" to a "representative sample" every refuel outage (nominally once every 24 months). The representative sample is based on approximately 20 percent of the valves each 2-year cycle such that each valve is tested at least every 10 years (nominal).

BASIS FOR RELIEF: NEDO-32977-A and the associated NRC Safety Evaluation, dated March 14, 2000, provide the basis for this relief. NEDO-32977-A justifies relaxing the EFCV testing frequency from the current testing of each valve once/cycle to an approximately 20% sample once/cycle such that each valve is tested within a 10-year interval.

NEDO-32977-A demonstrates, through operating experience, a high degree of reliability with EFCVs and the low consequences of an EFCV failure. Reliability data in the report (Tables 4-1 and 4-2) documents two EFCV failures (failure to close) at four participating plants (Monticello, Dresden, Vermont Yankee, and Oyster Creek) for Chemequip valves similar to those used at PNPS. These two failures were observed over a service time of 5426 operating years (4.75E+07 operating hours). This results in a "Best Estimate Failure Rate" of 4.21E-08 per hour of operating time and an "Upper Limit Failure Rate" of 1.33E-07 per hour of operating time. A review of historical test surveillance data and a test failure component history search at PNPS shows zero EFCV failures (failure to close) have been observed (data from 1983 through 1999 RFO #12). In addition, there are no known EFCV failures that occurred earlier than 1983.

The instrument lines at PNPS have a flow restricting orifice upstream of the EFCVs to limit Reactor water leakage in the event of rupture. Previous evaluations contained in PNPS's Updated Final Safety Analysis Report (FSAR) of such an instrument line rupture do not credit the EFCVs for isolating the rupture. Thus, a failure of an EFCV, though not expected as a result of this request, is bounded by the analysis. Based on NEDO-32977-A and the analysis contained in PNPS's FSAR, the proposed alternative to the required exercise testing frequency for EFCVs prescribed by OM-10 provides a satisfactory level of quality and safety.

[1] VALVE RELIEF REQUEST VR-01 (CONTINUED)

ALTERNATE TESTING: This Relief Request proposes to exercise close test, by full-stroke to the position required to fulfill its function, a representative sample of EFCVs every refueling outage. During the close test, gross valve seat leakage (LEF) will be measured. The representative sample is based on approximately 20 percent of the valves each cycle such that each valve is tested every 10 years (nominal). An exercise open test will be performed on each valve following the exercise close test and leak testing.

EFCV failures will be documented in PNPS's Corrective Action Program as a surveillance test failure. The failure will be evaluated and corrected. The Administrative EFCV Sample Test Program procedure will trend EFCV test failures and determine whether additional testing is warranted.

The Administrative EFCV Sample Test Program procedure will also establish a minimum acceptance criteria for Chemequip EFCVs of less than or equal to one failure per year (two failures per 2 years) on a 2-year rolling average. This requirement will ensure EFCV performance remains consistent with the extended test interval. Upon exceeding the criteria, an evaluation will be required which will:

- require a root cause evaluation to determine cause;
- determine the extent of conditions;
- require an evaluation of the testing interval to ensure reliability of the EFCVs; and
- produce a risk analysis of the effects of the failures on cumulative and instantaneous plant safety.

Corrective actions and performance goals will be established based on the results of the root cause analysis.

REFERENCES: NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," dated June 2000

Safety Evaluation by the Office of Nuclear Reactor Regulation related to a Relief Request for excess flow check valve testing frequency at Pilgrim Nuclear Power Station Docket No. 50-293, dated September 17, 2002 (TAC No. MB5122)

[2] VALVE RELIEF REQUEST VR-02

SYSTEM: Nuclear Boiler Instrumentation (263)

VALVES: 2-CK-125A, 2-CK-125B (manufactured by Dragon)

CATEGORY: AC

CLASS: 2

FUNCTION: Excess Flow Check Valves (EFCVs) are installed within each instrument process line that is part of the Reactor coolant pressure boundary (RCPB) and that penetrates primary containment. Each EFCV closes to limit flow within the respective instrument line in the event of an instrument line break downstream of the EFCV.

TEST REQUIREMENT: ASME OM Code Subsection ISTC paragraph 4.5.1 requires these valves to be tested nominally every 3 months, except as specified by ISTC paragraph 4.5.2. The PNPS IST Program takes exception to the testing requirements in accordance with subparagraphs ISTC 4.5.2(c) and ISTC 4.5.2(f).

ISTC 4.5.2(c): If exercising is not practicable during plant operation and cold shutdowns, it shall be performed during refueling outages.

ISTC 4.5.2(f): All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation.

ISTC 4.3.3(a) Frequency. Tests shall be conducted at least once every 2 years.

RELIEF REQUESTED: Relaxation of the number of EFCVs tested every refuel outage from "each" to a "representative sample" every refuel outage (nominally once every 24 months). The representative sample is based on approximately 20 percent of the valves (for the case of Dragon EFCVs, one valve) each 2-year cycle such that each valve is tested at least every 10 years.

BASIS FOR RELIEF: NEDO-32977-A and the associated NRC Safety Evaluation, dated March 14, 2000, provide the basis for this relief. NEDO-32977-A justifies relaxing the EFCV testing frequency from the current testing of each valve once/cycle to an approximately 20% sample once/cycle such that each valve is tested within a 10-year interval.

NEDO-32977-A demonstrates, through operating experience, a high degree of reliability with EFCVs and the low consequences of an EFCV failure. Reliability data in the report (Tables 4-1 and 4.2) documents two EFCV failures (failure to close) at three participating plants (Clinton, Fermi, and WNP2) for Dragon valves similar to those used at PNPS. These two failures were observed over a service time of 2494 operating years (2.18E+07 operating hours). This results in a "Best Estimate Failure Rate" of 9.2E-08 per hour of operating time and an "Upper Limit Failure Rate" of 2.89E-07 per hour of operating time.

A review of historical test surveillance data and a test failure component history search at PNPS show zero EFCV failures (failure to close) have been observed from 1989 through 1999 RFO 12 (initially installed in 1987, but could not undergo meaningful plant testing until 1989 because design actuation flow rate was greater than available system test flow rate).

The instrument lines at PNPS have a flow restricting orifice upstream of the EFCVs to limit Reactor water leakage in the event of rupture. Previous evaluations contained in PNPS's Updated Final Safety Analysis Report (FSAR) of such an instrument line rupture do not credit the EFCVs for isolating the rupture. Thus, a failure of an EFCV, though not expected as a result of this request, is bounded by the analysis. Based on NEDO-32977-A and the analysis contained in PNPS's FSAR, the proposed alternative to the required exercise testing frequency for EFCVs prescribed by OM-10 provides a satisfactory level of quality and safety.

<u>ALTERNATE TESTING</u>: This Relief Request proposes to exercise open test and exercise close test, by full-stroke to the position required to fulfill its function, a representative sample of EFCVs every refueling outage. During the close test, gross valve seat leakage (LEF) will be measured. The representative sample is based on approximately 20 percent of the valves (for the case of Dragon EFCVs, one valve) each cycle such that each valve is tested at least once every 10 years. An exercise open test will be performed on each valve following the exercise close test and leak testing.

EFCV failures will be documented in PNPS's Corrective Action Program as a surveillance test failure. The failure will be evaluated and corrected. The Administrative EFCV Sample Test Program procedure will trend EFCV test failure and determine whether additional testing is warranted.

The Administrative EFCV Sample Test Program procedure will also establish minimum acceptance criteria for Dragon EFCVs of less than or equal to 1/2 failure per year (one failure per 2 years) on a 2-year rolling average. This requirement will ensure EFCV performance remains consistent with the extended test interval. Upon exceeding the criteria, an evaluation will be required which will:

- require a root cause evaluation to determine cause;
- determine the extent of conditions;
- require an evaluation of the testing interval to ensure reliability of the EFCVs; and
- produce a risk analysis of the effects of the failures on cumulative and instantaneous plant safety.

Corrective actions and performance goals will be established based on the results of the root cause analysis.

<u>REFERENCES</u>: NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," dated June 2000

Safety Evaluation by the Office of Nuclear Reactor Regulation related to a Relief Request for excess flow check valve testing frequency at Pilgrim Nuclear Power Station Docket No. 50-293, dated May 2, 2001 (TAC No. MB1124)

[3] VALVE RELIEF REQUEST VR-03

SYSTEM: As Applicable

VALVES: All Category A and AC valves requiring periodic leakage rate testing with the exception of containment isolation valves, pressure isolation valves, and pressure-relief devices.

CATEGORY: A and AC

CLASS: 2

FUNCTION: Valves with seat leakage requirements; inventory preservation, intersystem leakage, and bypass flow. These valves are grouped by valve type, system application, and safety function and have been listed by their function 1) parallel pump bypass flow, 2) instrument boundary isolation, and 3) boundary integrity.

TEST REQUIREMENT: ISTC 4.3.3(a), Frequency. Tests shall be conducted at least once every 2 years.

RELIEF REQUESTED: Leakage rate testing of Category A and AC valves will be performed in accordance with the Performance-Based Testing (PBT) Program in lieu of Subsection ISTC 4.3.3(a), Frequency.

BASIS FOR RELIEF: A Performance-Based Testing Program (PBT Program) has been developed which relaxes the prescriptive OM Code seat leakage test frequency requirements and allows test intervals to be based on system service and component performance. Through its own Regulatory Improvement Program, the NRC has instituted an ongoing effort to eliminate requirements that are marginal to safety and to reduce the regulatory burden on utilities. A PBT Program, utilizing an extended testing interval based on the successful completion of two or more consecutive leakage rate tests, would take advantage of the findings of NUREG-1493 Appendix A. The conclusions drawn by the NUREG suggest that "if a component does not fail within two operating cycles, further failures appear to be governed by the random failure rate of the component". The NUREG also states that any test scheme considered should require a failed component to pass at least two consecutive tests before allowing the extended test interval to be applied.

The PBT Program for valves that require seat leakage testing under the OM Code, Subsection ISTC was developed in much the same manner as the Option B Program for Appendix J tested valves, which was permitted by amendment of the Code of Federal Regulations on October 26, 1995. In the studies performed in support of the Code change, it was concluded that performance-based testing is feasible without significant risk (NUREG 1493). Also, EPRI Research Project Report TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals", reaffirmed this position by stating that changes in leakage testing frequencies are feasible without significant risk impact.

The PNPS PBT Program utilizes over a decade of valve seat leakage test data for all the valves (except for the Reactor Vessel Level Reference Leg Backfill Supply Check Valves C2205A & C2206A) included within this program. A test history review was conducted for each valve to determine long-term valve performance and to obtain performance insights that can be used to screen out "suspect valves" that are either more prone to failure or exhibit erratic behavior.

All the valves were then categorized based upon their valve type (i.e., check, globe, gate, and ball) and system application to determine which specific valve groups may be more prone to failure. By grouping the valves, a comparison can be performed of similar valves which are in systems with similar service conditions to determine whether some of the valves with good test histories should continue to be monitored more frequently.

Valves that pass a minimum of two consecutive tests exhibit normal operational behavior and have not been flagged as "suspect valves" will be placed on an extended test interval of 4 years or two refueling intervals, whichever is longer. Any valve not meeting the minimum threshold test performance requirement will be left on a 2-year test interval until at least two periodic consecutive acceptable tests have been achieved. In addition, if a failure occurs on any extended interval valve, the initial test frequency of 2 years must be re-established until two consecutive tests are acceptable.

ALTERNATE TESTING: Leakage rate testing of Category A and AC valves will be performed in accordance with the Performance-Based Testing Program. Valves that have met the threshold of passing two periodic consecutive tests will be permitted to be tested every 4 years or two refueling intervals, whichever is longer. Valves which fail their acceptance criterion will return to the 2-year test frequency and must pass a minimum of two consecutive tests before allowing the extended test interval to be reinstated.

DISCUSSION: The following pages contain the PBT valve groups. The valves included within this Relief Request are categorized by the valve type, system application, and safety function requiring a seat leakage limit. Valves shall meet the applicable guidelines of the Nuclear Energy Institute (NEI-94-01) Industry Guidelines for Implementing Performance-Based Option of 10CFR Part 50, Appendix J for a performance-based testing program. Using the guidelines, valves that have passed a minimum of two consecutive leakage rate tests may be placed on an extended testing interval. All valves placed on an extended testing interval for seat leakage will still have all other associated ASME OMa Code testing (i.e., exercising and position verification) performed at the required frequency by the Inservice Testing Program. Valves that have not passed the minimum of two consecutive tests will continue to be tested during each refueling interval until their test performance permits an extended testing interval.

Each valve or combination of valves has been assigned an operational frequency rating, which is indicative of the expected frequency that the valve would perform an active function (i.e., opening and closing). The valve operational frequency when combined with system service conditions provides a useful indicator that provides insights related to the expected rate of valve degradation. The assigned operational frequency ratings are defined as follows: Seldom, Infrequent, Occasional, and Frequent.

Seldom - Maintenance or convenience type valves in which operation is seldom desired or required.

Infrequent - Valves in which operation would be expected at a cold shutdown or greater frequency for testing or other evolutions.

Occasional - Valves in which operation would be expected at a quarterly frequency for testing or other evolutions.

Frequent - Valves in which operation is expected during normal plant operation for reasons other than testing. Valves assigned as Frequent will be reviewed for exclusion from the performance-based testing program. If the review shows that normal operation of a specific valve may impair long-term seat leakage reliability, then it will be excluded.

SAFETY RELATED SYSTEM "Q"-LIST/SEISMIC BOUNDARY INTEGRITY

Safety related systems that require an active/passive isolation between ASME Code Class and non-Seismic/non-"Q"-List boundary. The isolation ensures that safety-related systems carrying contaminated water postaccident will not leak outside the "Q"-List/Seismic boundary. These valves remain closed during normal plant operation and have their seat leakage limited to a specific maximum amount. Maintaining the seat leakage below a specified limit ensures that system boundary integrity.

Residual Heat Removal to Radwaste Crosstie - Occasional:

RHR System Discharge To Radwaste Flow Control Valve (MO-1001-21) and RHR System Discharge To Radwaste Block Valve (MO-1001-32) provide the boundary isolation between the RHR System and the Radwaste System. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

Residual Heat Removal Keepfill to Condensate System - Occasional:

RHR A and B Keepfill Supply Check Valves (CK-1001-363A & 362B) provide the boundary integrity for the keepfill line. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

Core Spray to Condensate Storage Tank Crosstie - Seldom:

Core Spray Pump A and B Suction Valves From Condensate Storage Tank (1400-2A & 2B) provide the boundary isolation between the Core Spray System and the Condensate Storage Tank. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

Core Spray Keepfill to Condensate System - Occasional:

Core Spray A and B Keepfill Supply Check Valves (CK-1400-212A & 212B) provide the boundary integrity for the keepfill line. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

HPCI Pump Suction From Condensate Storage Tank Crosstie - Occasional:

HPCI Pump Suction Valve From Condensate Storage Tank (CK-2301-20) provides the boundary isolation between the HPCI System and the Condensate Storage Tank. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

RCIC Pump Suction From Condensate Storage Tank Crosstie - Occasional:

RCIC Pump Suction Valve From Condensate Storage Tank (CK-1301-23) provides the boundary isolation between the HPCI System and the Condensate Storage Tank. Maintaining seat leakage below the specified limit ensures the secondary containment bypass leakage is minimized. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

SDV Vent and Drain Valves to Reactor Building Sump - Occasional:

Scram Discharge Volume Vent Valves (CV-302-21A/B & CV-302-23A/B) and Scram Discharge Volume Drain Valves (CV-302-22A/B & CV-302-24A/B) provide the boundary isolation between the SDV and the Reactor Building Sump. Maintaining seat leakage below the specified limit ensures the isolation from the Reactor coolant pressure boundary (RCPB) during a Scram is maintained. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

PARALLEL PUMP BYPASS FLOW

Systems that require an active isolation of the parallel pump loop to perform the desired safety function may require the isolation feature to allow minimum system leakage.

Standby Liquid Control (SLC) System Parallel Pump Bypass Flow - Occasional:

SLC Pump A and B Discharge Check Valves (CK-1101-43A/B) allow flow of borated coolant to the Reactor Vessel upon activation and prevent pump bypass flow upon closure in the event of a pump's discharge relief failure to close tightly. Maintaining seat leakage below the specified limit ensures minimum pump bypass flow. Seat leakage is currently being measured by the feed rate required to maintain test pressure in the test volume.

BOUNDARY INTEGRITY

RPV Water Level Instruments Continuous Backfill - Frequent:

Reactor Vessel Level Reference Leg Backfill Supply Check Valves (C2205A & C2206A Series Pair) provide a makeup flow path from the Control Rod Drive (CRD) System to each of the Reactor Pressure Vessel level sensing line reference legs This backfill is used to prevent errors in Reactor Vessel level indication during normal and transient operating conditions. The backfill allows makeup flow which prevents the buildup of noncondensable gases. The portion of the CRD System which supplies the makeup flow is non-safety related and the supply check valves must close and limit seat leakage to a specific maximum amount upon loss of the CRD System. Maintaining the seat leakage below the specified limit ensures proper Reactor Vessel level indication and minimizes a potential Reactor coolant leakage path. Seat leakage measurement is currently satisfied by measuring leakage through a downstream telltale connection while maintaining test pressure on one side.

Standby Liquid Control (SLC) Injection Line - Infrequent:

SLC Inboard Injection Check Valve (CK-1101-15) provides a pressure isolation barrier between the RCS from the high pressure portion of the SLC System. Normal penetration isolations include an inboard injection valve, an outboard injection valve, and squib valves. Upon firing of the squib valves with the RCS at operating pressure, this check valve becomes one of the two isolation barriers. Therefore, the valve performs an isolation barrier between the high pressure Reactor system to high pressure safety system interface. Seat leakage measurement is currently satisfied by collecting leakage at the upstream test connection while maintaining test pressure during the Reactor Pressure Vessel leak test.

[4] VALVE RELIEF REQUEST VR-04

SYSTEM: As Applicable

VALVES: As Applicable

CATEGORY: A, B

CLASS: 1, 2, and 3

FUNCTION: Valves required to provide remote position indication and allow for proper operator action during normal operation, abnormal conditions, or emergency situations.

TEST REQUIREMENT: ISTC 4.1, Valve Position Verification. Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation.

RELIEF REQUESTED: Relief is requested from performance of the routinely scheduled position indication verification of at least once every 2 years.

BASIS FOR RELIEF: With the institution of 10CFR50.65, Maintenance Rule, plants have ensured that subsequent to work on safety related valves proper postmaintenance testing is performed prior to declaring the valve operable. The postmaintenance testing for valves with remote position indicators ensures that the remote valve position indicators accurately relect valve travel direction. Work activities that would require such a retest are controlled administratively by PNPS postmaintenance guidelines. These strict procedural guidelines over maintenance (both corrective and preventive) activities ensure that proper retests are performed.

Review of PNPS historical test data since 1987 supports the proposed alternate testing in that no position indication failures have been detected during the Code required periodic testing over this period of time. There has been incorrect maintenance performed in which the postmaintenance valve position indication verification test has identified failure. Correspondence with other utilities has shown that plants with strict procedural controls over their maintenance activities have not experienced failures during routinely scheduled 2-year valve position indication verifications.

Industry review has established that the primary means of identifying improper valve position is through system restoration (i.e., returning to normal system operating or standby alignment) following a maintenance outage. Further review has shown that improper valve indication is, except on rare occasion, identified by postmaintenance testing activities, not by routinely scheduled position indication verification tests.

The hardships encountered during the performance of these periodic valve position verifications includes stationing of additional personnel locally (i.e., at the valve) with effective communications to observe valve stroking and performance of special tests when valve position cannot be verified locally. There are subtantial plant resources (Planning and Scheduling, Operations group, Instrumention and Controls group, Programs Test group, Radiation Protection group, and ALARA group) dedicated to the performance of these verifications which require: prejob briefings (e.g., Control Room personnel must be assigned in lieu of other critical tasks), establishing of effective communications (i.e., local and the Control Room), stationing of personnel locally at the valve, and documenting of the verification results. Where the local observation is not possible, other indications are used for the verification of valve operation, such as specialized tests (i.e., seat leakage, system flow, etc.). Additionally, stationing personnel locally at a valve for observation may require admittance to radiation, high radiation, and possibly locked high radiation areas, thus undermining good ALARA practice.

The Code position indication requirement is not a test but a simple verification of indicator function. Therefore, position indication is not a parameter that would detect degradation or provide added assurance of valve reliability, but simply verifies valve position. PNPS considers that the proposed alternate testing, and the continuation of current OM Code testing activities, switch-to-light stroke timing and full stroke exercising of active valves, provide adequate assurance that proper valve operation is accurately indicated. In addition, procedural controls for system restoration ensure that plant systems are properly aligned to accomplish their intended function.

<u>ALTERNATE TESTING</u>: Valve position indication verification shall be performed as postmaintenance testing.

[5] VALVE RELIEF REQUEST VR-05

SYSTEM: Main Steam (203)

VALVES: 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D

CATEGORY: A

CLASS: 1

FUNCTION: The Main Steam Isolation Valves (MSIVs) must close to quickly terminate Reactor steam flow to the Turbine Building during specified plant conditions and/or close to isolate the main steam line (primary containment) penetrations.

TEST REQUIREMENT: ISTC 4.2.8, Stroke Time Acceptance Criteria. Test results shall be compared to the initial reference values or reference values established in accordance with paragraphs ISTC 3.4 and ISTC 3.5.

ISTC 4.2.8(d): Other power-operated valves with reference stroke times of less than or equal to 10 seconds shall exhibit not more than a ± 50% nor ± 1 second change in stroke times, whichever is greater, when compared to the reference value.

RELIEF REQUESTED: Relief is requested to use the PNPS Technical Specifications in lieu of the OM Code Subsection ISTC requirements for MSIV stroke timing.

BASIS FOR RELIEF: The stroke times of MSIVs are adjusted within an acceptable band of 3 to 5 sconds by adjusting orifices (i.e., needle valve) associated with hydraulic dashpots attached to each operator. Thus, the stroke time performance of each valve operator is more a function of the dashpot setting than the material condition of the valve.

The strict acceptable band of between 3 and 5 (4 ±1 second) seconds is restrictive enough to ensure that each of the valves remains operable within the established limits of the plant safety analyses. When recording MSIV stroke times to the nearest tenth of a second, the impracticality of meeting the Code becomes apparent when the reference value is between 3.0 and 3.3 seconds. As part of PNPS maintenance practice, efforts are made to set the MSIV hydraulic dashpot to obtain a reference stroke time that is greater than 3.3 seconds. Elimination of the ± 50 percent limit will have no impact on valve reliability nor on the health and safety of the public.

ALTERNATE TESTING: The stroke time acceptance criteria for these valves will be determined by the PNPS Technical Specifications, which is between 3 and 5 seconds. Code reference stroke times will not be established nor will the acceptance criteria of ISTC 4.2.8(d) be applied to the test results.

[6] VALVE RELIEF REQUEST VR-06

SYSTEM: As Applicable

VALVES: All Category A and AC Pressure Isolation Valves (PIVs)

CATEGORY: A and AC

CLASS: 1

FUNCTION: Pressure Isolation Valves (PIVs) have seat leakage acceptance limits for providing Reactor Coolant Pressure Boundary (RCPB) isolation. PIVs are configured as two isolation valves in series providing redundant pressure isolation between the higher Reactor pressure and the lower rated pressure system.

TEST REQUIREMENT: ISTC 4.3.3(a) Frequency. Tests shall be conducted at least once every 2 years.

RELIEF REQUESTED: Pressure Isolation Valves will be placed into a Performance-Based Testing (PBT) Program in lieu of testing to Subsection ISTC 4.3.3(a), Frequency. The PIVs will be grouped as a penetration (pressure isolation boundary) pair to monitor and assess leaktightness.

BASIS FOR RELIEF: A Performance-Based Testing Program (PBT Program) has been developed which relaxes the prescriptive OM Code seat leakage test frequency requirements and allows test intervals to be based on system service and component performance. Through its own Regulatory Improvement Program, the NRC has instituted an ongoing effort to eliminate requirements that are marginal to safety and to reduce the regulatory burden on utilities. A PBT Program, utilizing an extended testing interval based on the successful completion of two or more consecutive leakage rate tests, would take advantage of the findings of NUREG-1493 Appendix A. The conclusions drawn by the NUREG suggest that "if a component does not fail within two operating cycles, further failures appear to be governed by the random failure rate of the component". The NUREG also states that any test scheme considered should require a failed component to pass at least two consecutive tests before allowing the extended test interval to be applied.

The applicable penetrations and their associated pressure isolation valves have been assigned the highest quality group (Quality Group A) for design, fabrication, testing, and inservice inspection. These design and fabrication requirements minimize the probability of an accidental rupture of the penetration or those lines connected to the penetration. The testing and inservice inspection requirements ensure piping and components maintain their operability and structural integrity throughout the plant's service life. The design configuration (i.e., two valves in series) satisfies the need to protect against a single failure within the RCPB, as it pertains to an intersystem LOCA. If the frequency extension criteria are assigned to each penetration valve pair, the probability of a single failure is greatly reduced.

The PBT Program for PIVs that require seat leakage testing according to the OM Code was developed in much the same manner as the Option B Program for Appendix J tested valves, which was permitted by amendment of the Code of Federal Regulations on October 26, 1995. In the studies performed in support of the Code change, it was concluded that performance-based testing is feasible without significant risk (NUREG 1493). Also, EPRI Research Project Report TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals", reaffirmed this position by stating that changes in leakage testing frequencies are feasible without significant risk impact.

NUREG-1493 did <u>not</u> specifically address the impact on safety where Containment Isolation Valves (CIVs) also serve as PIVs. Regulatory Guide 1.163 endorsed the NEI guidance document but placed limitations on certain valves whose frequencies could not be extended unless the additional risk was considered and appropriately evaluated. The NRC has identified PIVs as fitting this group of valves requiring further risk justification. When evaluating these dual-purpose valves (i.e., CIV/PIV), it was concluded that applying the extension criteria to the PIV penetration, as a valve pair, would lower the risk to an acceptable level of quality and safety. Additionally, each penetration configuration specifies which valve's safety function is for RCPB isolation and/or primary containment isolation. Configurations include:

- <u>Configuration No. 1</u>: Inboard Check Valve (PIV), First Motor-Operated Valve (PIV/CIV) and Second Motor-Operated Valve (CIV). The penetration piping and components providing the RCPB isolation function are designed and tested to Quality Group A. The remaining outboard portion, designated for containment isolation, is designed and tested to Quality Group B. The second motor-operated valve (non-PIV) is designed to allow closure at normal Reactor pressure, thereby providing a backup isolation feature.

- <u>Configuration No. 2</u>: Inboard Motor-Operated Valve (PIV/CIV) and Outboard Motor-Operated Valve (PIV/CIV). The penetration piping and components provide RCPB isolation and containment isolation and are designed and tested to Quality Group A. Both of these valves have automatic isolation interlocks which initiate valve closure (and does not allow reopening using electrical power) when Reactor coolant pressure is greater than 70 psig. These valves cannot inadvertently be placed in the open position due to the aforementioned interlocks and the actuator is not designed with sufficient force to overcome the pressure differential across the disk.

- <u>Configuration No. 3</u>: Inboard Feedwater Check (CIV), Inboard HPCI System Check Valve (PIV), and Outboard Motor-Operated Valve (PIV/CIV). The penetration piping and components that provide both RCPB isolation and containment isolation are designed and tested to Quality Group A. These penetrations allow high pressure injection of makeup water into RCS; therefore, the system is designed for high pressures and equipped with additional isolation features.

Each penetration configuration was designed and constructed to withstand the long-term high pressure service associated with the RCS out to the furthermost designated isolation valve from containment. When assessing the risk to a penetration, a degraded PIV(s) could be provided with backup isolation capability, in the case of Configurations 1 and 3, by an additional leak tested isolation valve. These valves are designated as CIVs only, but are designed to the same pressure/temperature ratings as RCS piping and components, therefore, are capable of performing an RCPB isolation function, if necessary. Existing plant design provides instrumentation to monitor abnormal penetration leakage. Should leakage be detected, closure of this additional high pressure isolation valve, through operator action, would prevent exposing the attached downstream piping and components to an overpressure condition.

The Pressure Isolation Valve PBT Program utilizes over 15 years of valve seat leakage test data. Hydrodynamic leakage testing for valves categorized as PIVs at PNPS began in 1987. Currently, eight satisfactory periodic hydrodynamic leak rate tests, at the maximum function differential pressure (typically 1040 psig), have been completed for each PIV. Of the PIV population at PNPS, only two valves (CK-1001-68B and CK-1301-50) have experienced test failures. A Design Change was implemented in 1999 which addressed the failure of CK-1001-68B by installing a swing check to replace the original tilting disk check. The failure mechanism was determined to be improper hinge pin alignment and excessive machining performed during corrective maintenance in 1987. The machining error resulted in the removal of an excessive amount of base material from the valve seating area. The new design has undergone at least two successful periodic leak rate tests performed in 1999 and 2001. CK-1301-50 experienced a seat leakage failure in 1991. The failure mechanism was determined to be a flaw associated with the manual exerciser internal mechanism, whereas a square key was not properly secured in the manual exercising shaft keyway. The detachment of the key and subsequent lodging of the key in the valve internal exerciser resulted in the disk not making full contact with the valve seat. A modification was performed on the shaft keyway to key interface which provided a method to securely attach the key in a more reliable fashion. Since the modification, there have been five successful PIV seat leakage tests.

A review of test history was conducted for each PIV to determine long-term valve performance and to obtain performance insights that can be used to screen out "suspect valves" that are either more prone to failure or exhibit erratic behavior. The valves were then categorized based upon their type (swing check, tilting disk check, and gate) and system application to determine which specific valve groups may be more prone to failure. A comparison was performed of similar PIVs situated in systems with similar service conditions to determine whether certain valves with good test histories should continue to be monitored more frequently.

A PIV pair in a common penetration that passes a minimum of two consecutive tests, exhibits normal operational behavior, and have not been screened out as "suspect valves" will be placed on an extended test interval of 4 years or two refueling intervals, whichever is longer. Any valve pair not meeting the minimum threshold test performance requirement will be left on a 2-year test interval until at least two consecutive acceptable tests have been achieved. In addition, if a failure occurs on any extended interval PIV, the initial test frequency of 2 years shall be re-established for the pair until two consecutive periodic tests are acceptable for both valves. All failures will be evaluated for cause and effect.

[6] VALVE RELIEF REQUEST VR-06 (CONTINUED)

ALTERNATE TESTING: Hydrodynamic leak rate testing of PIVs will be performed using the frequencies specified within the PIV Performance-Based Testing Program. Penetration valve pairs that meet the threshold requirement of passing two consecutive tests, both valves in the pair will be permitted to be tested every 4 years or two refueling intervals, whichever is longer. A valve that fails its acceptance criterion shall require the PIV pair to be tested at a 2-year test frequency until both valves in the penetration pass a minimum of two consecutive tests before allowing the extended test interval to be reinstated.

DISCUSSION: The following is a listing of PIV pairs associated with a common penetration. Valves affected by this Relief Request perform the safety function of RCPB isolation and require a specified seat leakage limit. These valves shall meet the applicable guidelines of the Nuclear Energy Institute (NEI-94-01) Industry Guidelines for Implementing Performance-Based Option of 10CFR Part 50, Appendix J for a performance-based testing program. Using these guidelines, a penetration valve pair that has passed a minimum of two consecutive leak rate tests may be placed on an extended testing interval. All valves placed on an extended testing interval for seat leakage will continue to receive any other associated OM Code required testing (i.e., exercising, stroke timing and position verification) at the IST Program specified frequencies. A valve pair, in a penetration, that has not passed the minimum of two consecutive tests will require both valves in the penetration to be tested during each refueling outage until their test performance permits an extended testing interval.

REACTOR COOLANT PRESSURE ISOLATION

A Pressure Isolation Valve (PIV) pair in a common penetration is defined as two normally closed valves in series that isolate the Reactor coolant system (RCS) from an attached low-pressure system. These valves are tested to minimize the probability of an intersystem LOCA and are normally operated (open and close) on an infrequent basis (cold shutdown or refueling outage). The infrequent service that each valve experiences, due to open and close cycling, has no impact on long-term seat leakage reliability.

Maintaining the seat leakage below the specified limit ensures the proper leaktightness of the RCS pressure boundary.

Residual Heat Removal (RHR) Injection/Suction Lines Penetration Valve Pairs:

- RHR Loop A Injection Line *Penetration Valve Pair* consists of CK-1001-68A, RHR Injection Line Check Vlv, and MO-1001-29A, LPCI Loop A Injection Valve #2 (Configuration No. 1).
- RHR Loop B Injection Line *Penetration Valve Pair* consists of CK-1001-68B, RHR Injection Line Check Vlv, and MO-1001-29B, LPCI Loop B Injection Valve #2 (Configuration No. 1).
- RHR Shutdown Cooling Line *Penetration Valve Pair* consists of MO-1001-47, RHR Shutdown Cooling Outboard Isolation Valve, and MO-1001-50, RHR Shutdown Cooling Inboard Isolation Valve (Configuration No. 2).

Core Spray (CS) Injection Lines Penetration Valve Pairs:

- Core Spray Loop A Injection Line *Penetration Valve Pair* consists of CK-1400-9A, Core Spray Injection Check Valve, and MO-1400-25A, Core Spray Loop A Injection Vlv #2 (Configuration No. 1).
- Core Spray Loop B Injection Line *Penetration Valve Pair* consists of CK-1400-9B, Core Spray Injection Check Valve, and MO-1400-25B, Core Spray Loop B Injection Vlv #2 (Configuration No. 1).

High Pressure Core Injection (HPCI) Line Penetration Valve Pair:

- HPCI Injection Line *Penetration Valve Pair* consists of CK-2301-7, HPCI Discharge Check Valve, and MO-2301-8, HPCI Injection Valve #2 (Configuration No. 3).

Reactor Core Isolation Cooling (RCIC) Injection Line Penetration Valve Pair:

- RCIC Injection Line *Penetration Valve Pair* consists of CK-1301-50, RCIC Discharge Check Valve, and MO-1301-49, RCIC Pump Discharge Injection Valve #2 (Penetration Configuration No. 3).