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Kewaunee Nuclear Power Plant
Operated by Nuclear Management Company, LLC

NRC-03-088 10CFR50.55a

August 14, 2003

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

KEWAUNEE NUCLEAR POWER PLANT
DOCKET 50-305
LICENSE No. DPR-43
INSERVICE TESTING PROGRAM PROJECT

References: 1) Letter from Kyle A. Hoops (NMC) to US NRC dated September 21, 2001 (ADAMS Accession NO.ML012710313)

Nuclear Management Company, LLC (NMC), the licensee for Kewaunee Nuclear Power Plant (KNPP) has performed a comprehensive design basis review and revision of the Inservice Testing (IST) Program at KNPP. This effort was in response to various internal Quality Assurance audits as well as NRC inspections that identified potential weaknesses and areas for improvement. The Commission was previously informed of KNPPs proposed plan for implementing the IST Improvement Project (see referenced letter). The attached IST Program revision Q and the completion of the Basis Document revision were major milestones of the overall project.

Approximately 200 individual changes were made to Kewaunee's program. These include addition of valves conservatively determined to be in scope, changes in test frequency, reevaluation of component safety functions, revised relief requests, addition of augmented components and a manual valve test program. Notes from previous revisions have been developed into deferred test justifications, technical justifications and/or technical positions.

Appendix A and B of the revised IST Program contain pump and valve relief requests. NMC requests that the Commission review and approve these relief requests in accordance with 10 CFR 50.55a(f)(6)(i). The majority of these requests for relief have been previously approved for use during the 3rd 10 Year IST Interval as noted at the end of each basis for relief. The re-submittal of those reliefs previously approved represents a consolidation of multiple reliefs or simply renumbering an existing relief.

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The revision described in the note for Valve Relief Request VRR-01 includes the removal of certain thermal relief valves from the scope of the previously approved relief request. Changes to relief requests not previously approved include Appendix B, Valve Relief Requests VRR-02 and VRR-03, which were revised to address additional valves not included in the previously approved relief request.

If there are any questions or if additional information is required please contact Tim Smith of my staff at 920-388-8660.

Thomas Coutu
Site Vice-President, Kewaunee Plant

TMS

cc- US NRC, Region III
US NRC Senior Resident Inspector
Electric Division, PSCW

Attachment
1. KNPP IST Program Revision Q

ATTACHMENT 1

NUCLEAR MANAGEMENT COMPANY, LLC
KEWAUNEE NUCLEAR PLANT
DOCKET 50-305

August 14, 2003

Letter from Thomas Coutu (NMC)

To

Document Control Desk (NRC)

KNPP IST Program Revision Q

KEWAUNEE NUCLEAR PLANT
PUMPS AND VALVES IST PLAN
REVISION Q

REVIEWED Tim Smith DATE 6/26/2003
Inservice Testing Program Owner

APPROVED [signature] DATE 6/30/03
Manager – Kewaunee Plant

TABLE OF CONTENTS

1.0 INTRODUCTION

The pump and valve Inservice Testing (IST) Program for the Kewaunee Nuclear Power Plant (KNPP), details the technical basis and provides the overall description of the activities planned to fulfill the IST requirements for pumps and valves as specified in 10 CFR 50.55a(f)(4)(ii). KNPP Technical Specification 4.2.a.2 invoke, by reference, the requirement for IST of pumps and valves in accordance Section XI of the American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code as required by 10 CFR 50.55a.

In addition to the referenced ASME Code, this IST Program was prepared using the guidelines provided in non-mandatory Appendix A of the OM Code "Preparation of Test Plans", NRC NUREG-1482 "Guidelines for Inservice Testing at Nuclear Power Plants", Generic Letter (GL) 89-04. "Guidance on Developing Acceptable Inservice Testing Programs" and NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements". These documents provide the basis for component selection, test requirements, relief requests, and format.

In August of 2001, a comprehensive review was initiated of the design and licensing bases and regulatory commitments in regards to pump and valve inservice testing (IST) requirements at the Kewaunee Nuclear Power Plant (KNPP). Determinations of component safety functions and testing requirements and the bases for these determinations were documented in the KNPP IST Program Basis Document. As a result of this review, improvements to the IST Program were recommended and a number of required changes were identified to comply with regulatory and code requirements. This revision of the KNPP IST Program incorporates the improvements and required changes. All components tested under the IST Program are identified along with relevant component information, drawings, tests, and test frequencies. Appendices to this document contain requests for relief from code requirements, justifications of deferral of testing, utility technical positions and justifications.

2.0 CODE AND REGULATORY REQUIREMENTS

2.1 Code of Federal Regulations

Title 10, Part 50.55a of the Code of Federal Regulations, Paragraph (f)(4)(ii) requires that 10-year IST Programs comply with the latest NRC approved edition and addenda of Section XI incorporated by reference in Paragraph (b) 12 months prior to the start of the 120-month inspection interval. KNPP was initially placed into commercial service on June 1974 with the third 10-year inspection interval commencing June 16, 1994. The use of any later edition and addenda of Section XI is allowed if it has been incorporated in Paragraph (b)(2) of 10 CFR 50.55a, or if approved by the NRC as an acceptable alternative. At the time of this revision the latest edition of the Code approved for use by the NRC is the ASME OM Code 1998 with OMb-2000 Addenda.

According to 10 CFR 50.55a(f)(l) and 10 CFR 50.55a(f)(4), inservice testing shall be conducted in accordance with the appropriate edition/addenda of the Code to the extent practical within the limitations of design, geometry, and materials of construction. Where Code requirements have been determined to be impractical, written relief has been requested pursuant to 10 CFR 50.55a(a)3 or (f)(6).

2.2 Applicable Code

The Code of record for the current ten year testing interval is as follows:

- ASME Section XI, Division 1, "Rules for Inservice Inspection of Nuclear Power Plant Components", 1989 Edition
- ASME OM-1987, Part 1, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices"
- ASME OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants"
- ASME OMa-1988, Part 10, "Inservice Testing of Valves in Light-Water Reactor Power Plants"

However, per 10CFR50.55a(f)(4)(v), test requirements set forth in subsequent editions of codes and addenda, or portions thereof, may be adopted without requesting relief provided the applicable codes and addenda are approved for use in 10CFR50.55a(b). All related provisions must also be adopted when only portions of later code editions or addenda are used. Those portions of the later Code utilized at KNPP shall be documented in the IST Program.

3.0 GENERAL IST PROGRAM GUIDELINES AND SCOPE

The KNPP IST Program Basis Document establishes consistent guidelines for determining IST Program scope and testing requirements. The IST Program Basis Document contains evaluations of related components and provides the detailed bases for including components in the IST Program or for excluding them. The guidelines used for evaluating pumps and valves with respect to IST Program scope and for implementation of ASME Code requirements are defined in the KNPP IST Program Basis Document.

4.0 DEFINITIONS

4.1 **Active valves** - Valves which are required to change obturator position to accomplish a specific function for accident mitigation or achieving/maintaining safe shutdown. Active may also refer to a particular valve position with respect to safety function.

4.2 **Administrative Controls** - A valve shall be considered to be under administrative control, if; the valve is locked or de-energized in its normal position, or procedurally controlled if mispositioned. Administrative controls may also consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room.

4.3 **Closed System** - A system or portion of a system serving as an extension of the containment liner for the purpose of maintaining containment integrity. Designated closed systems shall be protected from missiles and high energy line breaks as well as designed in accordance with Class I seismic criteria.

4.4 **Containment Isolation Valve** - Valves providing a barrier between the containment environment and the outside environment which must be capable of closure to maintain containment integrity. Containment isolation valves are listed in USAR Section 5.2.

4.5 **Design Bases** - That information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals.

4.6 **Event V PIVs** - Two check valves in series at the reactor coolant system pressure boundary interface with a low pressure system which penetrates containment. Failure of Event V check valves during a LOCA may result in leakage bypassing containment.

4.7 **Exercising** - The demonstration based on direct or indirect visual or other positive indication that the moving parts of a valve function satisfactorily.

4.8 **Fail-safe Valves** - Valves equipped with fail-safe actuators that are required to move to a position intended to fulfill the intended safety function upon a loss of actuating power (typically instrument air and/or electrical control power).

4.9 **Full Stroke Time** - The time interval from initiation of the actuating signal to the indication of the end of the operating stroke.

4.10 **Instrument Accuracy** - The allowable inaccuracy of an instrument loop 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.

4.11 **Instrument Loop** - Two or more instruments or components working together to provide a single output (e.g., a vibration probe and its associated signal conditioning and readout devices).

4.12 **Limiting Value of Full-Stroke Time** - The calculated maximum allowable valve stroke time limit established to assure that corrective action is taken on a degraded valve before it reaches the point where there is a high probability of failure to perform its safety function if called upon. If a design, Technical Specification, USAR, or accident analysis limit exists which is more limiting, then it shall be used as the limiting value of full-stroke time in lieu of the calculated value.

4.13 **Non-intrusive Testing** - Testing performed on a component without disassembly or disturbing the pressure boundary of the component.

4.14 **Obturator** - Valve closure member (disk, gate, plug, ball, etc.)

4.15 **Operational Readiness** - The ability of a pump or valve to perform its intended function.

4.16 **Passive Valves** - Valves which maintain obturator position and are not required to change obturator position to accomplish their safety function. Passive may also refer to a particular valve position with respect to safety function.

4.17 **Plant Operation** - The conditions of startup, operation at power, hot standby, and reactor cooldown, as defined by the plant Technical Specifications.

4.18 **Preconditioning** – The act of exercising or placing a component in service for the purpose of enhancing the results of an inservice test. The act of preconditioning could mask a degrading condition that may otherwise be detected when testing a component in the "as found" condition. The exercising of a component when required by an Operations Procedure for system reconfiguration shall not constitute or be considered as preconditioning. It is an expectation to perform tests in the "as found" condition but not a Code requirement except for relief valves. Activities, which may be considered as preconditioning, should be justified.

4.19 **Preservice Test** - A test whose results are used to establish reference values for future tests.

4.20 **Preservice Test Period** - The period of time following completion of construction activities related to a component and before first electrical generation by nuclear heat, or in an operating plant, before the component is placed in service.

4.21 **Pressure Isolation Valves** - Two normally closed valves in series that form the reactor coolant pressure boundary and isolate reactor coolant system pressure from an attached low pressure system.

4.22 **Reactor Coolant System Pressure Boundary** - All those pressure retaining components of boiling and pressurized water reactors such as pressure vessels, piping, pumps, and valves which are:

4.22.1 Part of the reactor coolant system or,

4.22.2 Connected to the reactor coolant system, up to and including any and all of the following:

a. The outermost containment isolation valves in system piping which penetrates primary containment,

b. The second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary containment,

c. The reactor coolant system safety and relief valves.

4.23 **Reactor Coolant System Pressure Isolation** - The function that prevents intersystem overpressurization between the reactor coolant system and connected low pressure systems.

4.24 **Reference Point** - A point of operation at which reference values are established and inservice test parameters are measured for comparison with applicable acceptance criteria.

4.25 **Reference Values** - One or more values of test parameters measured or determined when the equipment is known to be operating acceptably.

4.26 **Routine Servicing** - The performance of planned, preventive maintenance (e.g. replacing or adjusting valves in reciprocating pumps, changing oil, flushing the cooling system, adjusting packing, adding packing rings or mechanical seal maintenance or replacement).

4.27 **Safe Shutdown** – The Mode a plant must achieve subsequent to a design basis accident as reflected in the plant safety analysis. KNPP is licensed as hot shutdown being safe shutdown.

4.27 **Safety-Related** - designation applied to components which must function to:

4.27.1 Assure the integrity of the reactor coolant pressure boundary,

4.27.2 Shut down the reactor and maintain it in a safe shutdown condition, or

4.28.3 Prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to 10CFR100 limits.

4.28 **Single Failure** - An occurrence which results in the loss of a capability of a component to perform its intended safety function(s). Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of a passive component (assuming active components function properly) results in a loss of the capability of the system to perform its safety functions.

4.30 **Skid-Mounted Pumps and Valves** - Pumps and valves which are integral to or that support operation of major components, even though these pumps and valves may not be located on the skid. In general, these pumps and valves are supplied by the manufacturer of the major component. Examples include: diesel fuel oil pumps and valves, steam admission and trip throttle valves for turbines, and solenoid operated pilot valves used to control air operated valves.

4.29 **System Resistance** - The hydraulic resistance to flow in a system.

4.30 **Trending** - A comparison of current data to previous data obtained under similar conditions for the same equipment.

4.31 **Valve Category** - The ASME Code defines test requirements by valve categories. All valves in the IST Program are assigned to one of the following categories:

4.31.1 <u>Category A</u> - Valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their function.

4.31.2 <u>Category B</u> - Valves for which seat leakage in the closed position is inconsequential for fulfillment of their function.

4.31.3 <u>Category C</u> - Valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of the required function.

4.31.4 <u>Category D</u> - Valves, which are actuated by an energy source capable of only one operation such as, rupture disks or explosive-actuated valves.

4.32 **Vertical Line Shaft Pump** - A vertically suspended pump, where the pump driver and the pumping element are connected by a line shaft within an enclosing column which contains the pump bearings, making pump bearing vibration measurements impracticable.

5.0 <u>REFERENCES</u>

5.1 Title 10, Code of Federal Regulations, Part 50

5.2 Updated Safety Analysis Report, KNPP

5.3 KNPP Technical Specifications

5.2 ASME Section XI, Division 1, "Rules for Inservice Inspection of Nuclear Power Plant Components", 1989 Edition

5.3 ASME OM-1987, Part 1, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices"

5.4 ASME OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants"

5.5 ASME OMa-1988, Part 10, "Inservice Testing of Valves in Light-Water Reactor Power Plants"

5.4 ASME OM Code-1995 Ed., with 1996 Addenda, "Code of Operation and Maintenance of Nuclear Power Plants."

5.5 NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"

5.6 NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

5.7 NRC minutes of public meetings on GL 89-04, dated October 25, 1989.

5.8 Letter K-96-66, NRC Safety Evaluation Report (SER), dated April 16, 1996, on the KNPP Inservice Testing Program, Third 10-Year Interval and Resolution to IST Program Anomalies.

5.9 Letter K-01-041, NRC (SER), dated March 27, 2001, on the KNPP Inservice Testing Program, Third 10-Year Interval.

5.10 Letter K-97-108, NRC (SER), dated June 30, 1997 on the KNPP Inservice Testing Program, Third 10-Year Interval.

5.11 Letter K-98-126, NRC SER, dated September 10, 1998, on the KNPP Inservice Testing Program, Third 10-Year Interval.

5.12 Letter K-94-157, NRC SER, dated July 15, 1994, on the KNPP Inservice Testing Program, Third 10-Year Interval.

5.13 Corporate Directive, CD 5.5 Inservice Testing Standard

5.14 Surveillance Procedure SP-55-177, Inservice Testing of Pumps Vibration Measurements

5.15 Third Interval Inservice Testing Program Basis Document

5.16 Nuclear Administrative Directive, NAD 1.24, Inservice Testing Program

5.17 NUREG/CR-6396, Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements, February 1996

6.0 PUMP IST PROGRAM

6.1 Pump Selection Criteria and Exemptions

6.1.1 The basic scope of the pump IST Program is defined in Paragraph 1.1 of ASME OMa-1988, Part 6. Per paragraph 1.1, IST requirements apply to all centrifugal and positive displacement pumps which are provided with an emergency power source, that are required in shutting down the reactor to a safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident. These functions are interpreted to be required during accident and transient conditions.

6.1.2 Fans and compressors are exempt from the ASME Code testing requirements

6.1.3 Drivers are exempt from ASME Code testing requirements except where the pump and driver form an integral unit and the pump bearings are located in the driver. Note that the ASME OM Code does not define "integral unit". Vibration measurements are not currently considered to be within the scope of ASME Section XI or the OM Code.

6.1.4 Pumps which do not perform a function within the scope of the ASME Code but are supplied with emergency power solely for operating convenience are exempt from ASME Code testing requirements.

6.1.5 Skid-mounted pumps and component subassemblies that are tested as part of the major component and are determined by the Owner to be adequately tested are exempt. (i.e. hydraulic pumps for valve actuation, diesel fuel oil pumps, etc.)

6.2 Pump Testing Frequency

An inservice test shall be run on each pump nominally every 3 months, except as provided in paragraphs 5.3, 5.4 and 5.4 of OM Part 6 and as reflected below.

6.2.1 Pumps in regular use that are operated more frequently than every 3 months provided the plant records show each such pump was operated at least once every 3 months at the reference conditions, and the quantities specified were determined, recorded and analyzed.

6.2.2 Pumps in systems out of service or not required to be operable, the test schedule need not be followed. Within 3 months prior to placing the system in an operable status, the pump shall be tested and the test schedule followed. Pumps that can only be tested during plant operation shall be tested within 1 week following plant startup.

6.2.3 Pumps lacking required fluid inventory shall be tested once every 2 years. Pumps of this nature do not exist at KNPP.

6.3 Duration of Tests

After pump conditions are as stable as the system permits, the pump shall be run for a minimum of 2 minutes prior to the acquisition of the required test parameters.

6.4 Pump Test Parameters and Allowable Ranges

6.4.1 The parameters for inservice pump testing are specified in Table 2 of OMa-1988, Part 6 and are reflected below in Table 6.4-1.

Table 6.4-1
Inservice Test Parameters

Quantity	Remarks
Speed, N	If variable speed
Differential Pressure, ΔP	Centrifugal pumps, including vertical line shaft pumps
Discharge Pressure, P	Positive displacement pumps
Flow Rate, Q	
Vibration Displacement, V_d Velocity, V_v	Measure either V_d or V_v Peak-to-peak Peak

6.4.2 Allowable Ranges for Pump Hydraulic Test Parameters

The allowable ranges for hydraulic test parameters are specified in Table 3b of the Code and are reflected below in Table 6.4-2.

Table 6.4-2
Ranges For Test Parameters

Test Parameter	Acceptable Range[2]	Alert Range	Required Action Range	
			Low	High
P (Positive displacement pumps)[1]	0.93 to 1.10 P_r	0.90 to < 0.93 P_r	< 0.90 P_r	> 1.10 P_r
ΔP (Vertical. line shaft pumps)	0.95 to 1.10 ΔP_r	0.93 to< 0.95 ΔP_r	< 0.93 ΔP_r	> 1.10 ΔP_r
Q (Positive displacement and vertical line shaft pumps)	0.95 to 1.10 Q_r	0.93 to < 0.95 Q_r	< 0.93 Q_r	> 1.10 Q_r
ΔP (Centrifugal pumps)	0.90 to 1.10 ΔP_r	none	< 0.90 ΔP_r	> 1.10 ΔP_r
Q (centrifugal pumps)	0.90 to 1.10 Q_r	none	< 0.90 Q_r	> 1.10 Q_r

1. Not applicable at KNPP

2. Subscript r denotes reference value

6.4.3 Allowable Variance from Fixed Reference Points

The Code does not allow for variance from a fixed reference value, stating only that "the resistance of the system shall be varied until the measured flow rate or measured differential pressure equals the corresponding reference value". If the system design does not allow for establishing and maintaining flow at an exact value, achieving a steady flow or differential pressure at approximately the reference value is acceptable without requesting relief. The allowed tolerance for setting the fixed parameter must be established for each case individually including the accuracy of the instrument and the precision of the display. A total tolerance of ±2% of the reference value is allowed without approval from the NRC. A corresponding adjustment to acceptance criteria may be made to compensate for the uncertainty, or an evaluation would be performed and documented justifying a greater tolerance. In using the guidance provided in NUREG-1482 Section 5.3, the variance and the method of establishing the variance must be documented in the IST program or implementing procedure.

6.4.4 Allowable Ranges for Vibration Data

The allowable ranges for pump tests vibration data is specified in Table 3a of OM-6 and are reflected below in Table 6.4-3. It should noted that Table 3a includes acceptance criteria for centrifugal and vertical line shaft pumps that have a pump speed of <600 rpm. The KNPP IST Program does not contain any pumps with a rotating speed of <600 rpm. Therefore, this acceptance criteria has been omitted from Table 6.4-3.

Table 6.4.3
Ranges For Test Parameters [1]

Pump Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range
Centrifugal and vertical line shaft [Notes (2) and (3)]	≥600 rpm	V_v or V_d	$\leq 2.5V_r$	$> 2.5V_r$ to $6\ V_r$ or >0.325 to 0.7 in/sec	$>6V_r$ or >0.7 in/sec
Reciprocating		V_d or V_v	$\leq 2.5V_r$	$> 2.5V_r$ to $6\ V_r$	$>6V_r$

Notes:
(1) Vibration parameter is per Table 2 of OM-6. V_r is vibration reference value in the selected unit.

(2) Refer to Figure 1 to establish displacement limits for pumps with speeds ≥600 rpm for velocity limits for pumps with speeds <600 rpm.
(3) Including positive displacement pumps except reciprocating.

6.4.5 Pump Testing Using Minimum-Flow Lines

Pursuant to GL 89-04, Position 9, for Safety Injection pump testing where flow can only be established through a non-instrumented minimum-flow path during quarterly pump testing and a path exists at cold shutdown or refueling outages to perform a test of the pump under full or substantial flow conditions, the staff has determined the increased interval is an acceptable alternative to the Code requirements. This is contingent upon pump differential pressure, flow rate, and bearing vibration measurements are taken during this testing and that quarterly testing also continues measuring at least pump differential pressure and vibration. Because the proposal to measure at least d/p and vibration while testing on the minimum-flow recirculation line quarterly and to measure all required Code parameters while the pump is operating at a full or substantial flow rate during CSDs or RFOs is approved by GL 89-04, relief need not be requested for this alternative. (re: NUREG/CR-6396, Section 3.1)

Verification of obtrurator movement to the open position for check valves in non-instrumented minimum flow recirculation paths is performed by monitoring pump parameters during the running of the pump test. This includes assuring the pump operates as required with no signs of malfunction such as elevated vibration or changes in hydraulic performance.

Operability testing of the Auxiliary Feedwater pumps may be performed utilizing the minimum flow recirculation lines pursuant to OM Code allowables of para. 4.5. KNP considers sufficient data exists from years of IST utilizing the minimum flow recirculation lines to provide reasonable assurance that the pumps are capable of performing their design safety function subsequent to performance alternating maintenance without the necessity of performing reduced power full flow testing.

6.5 Instrumentation

6.5.1 Instrument Accuracy

Instrument accuracy shall be within the limits specified in Table 1 of the Code and as reflected in Table 6.5-1 below. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table 1. For individual analog instruments, the required accuracy is percent of full scale. For digital instruments, the required accuracy is over the calibrated range. For a combination of instruments working together to provide a single output, the required accuracy is loop accuracy.

Table 6.5-1
Acceptable Instrument Accuracy

Quantity	Percent
Pressure	± 2
Flow Rate	± 2
Speed	± 2
Vibration	± 5
Differential Pressure	± 2

6.5.2 Range Requirements

(a) The full-scale range of each analog instrument shall be not greater than three times the reference value.

(b) Digital instruments shall be selected such that the reference value shall not exceed 70% of the calibrated range of the instrument.

(c) Vibration instruments are excluded from the preceding range requirements.

6.5.3 Differential Pressure

When determining differential pressure across a pump, a differential pressure gauge, differential pressure transmitter that provides direct measurement or the difference between the suction and discharge pressure may be used.

6.5.4 Flow Rate Measurement

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

6.5.5 Vibration Measurement

(a) 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. Measurement shall also be taken in the axial direction on each accessible pump thrust bearing housing.

(b) On vertical line shaft pumps, measurements shall be taken on the upper motor bearing housing in three orthogonal directions, one of which is the axial direction.

(c) If a portable vibration indicator is used, the reference points must be clearly identified on the pump to permit subsequent duplication in both location and plane.

6.6 Test Procedure

An inservice test shall be conducted with the pump operating at specified test reference conditions. The test parameters shown in Table 2 (Table 6.4-1) shall be determined and recorded as required by this paragraph. The test shall be conducted in accordance with the guidelines provided in OMa-1988 Part 6, para. 5.2 and as outlined below.

6.6.1 The pump shall be operated at nominal motor speed for constant speed drives and at a speed adjusted to the reference speed for variable speed drives.

6.6.2 The resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the pressure reaches the reference value and the flow rate shall be determined and compared to the reference flow rate value. Refer to Step 6.4.3 for discussion regarding variance of fixed reference values.

6.6.3 Where system resistance cannot be varied, flow rate and pressure shall be determined and compared to their respective reference values.

6.6.4 Pressure, flow rate, and vibration (displacement or velocity) shall be determined and compared with corresponding reference values. All deviations from the reference values shall be compared with the limits given in Table 3 (Tables 6.4-2 and 6.4-3) and corrective action taken as specified in para. 6.1 of the Code. Vibration measurements are to be broad band (unfiltered). If velocity measurements are used, they shall be peak-to-peak.

6.7 Reference Values

Reference values shall be determined from the results of preservice testing or from the results of the first inservice test. Reference values shall be at points of operation readily duplicated during subsequent tests. All subsequent test results shall be compared to these initial reference values or to new reference values established as a result of performance altering maintenance or established as a result of the desirability for an additional set of reference values as allowed by the Code.

6.7.1 Preservice Testing

Each pump shall be tested during the preservice test period as required by OM-6. This testing shall be conducted under conditions as near as practicable to those expected during subsequent inservice testing. Only one preservice test is required for each pump, except that the requirements of OM-6, para. 4.4 shall be meet.

6.7.2 Pump Repair, Replacement and Maintenance

When a reference value or set of values may have been affected by repair, replacement or routine servicing of a pump, a new reference value or set of values shall be determined or the previous values reconfirmed by an inservice test run prior to declaring the pump operable. Deviations between the previous and new set of reference values shall be identified, and verification that the new values represent acceptable pump operation shall be placed in the record of tests.

6.7.3 Additional Set of Reference Values

If it is necessary or desirable to establish an additional set of reference values, for some other reason than maintenance or repair/replacement, an inservice test shall first be run at the conditions of an existing set of reference values and the results analyzed. If operation is acceptable, a second test run at the new reference conditions shall follow as soon as practicable. The results of this test shall establish the additional set of reference values. Whenever an additional set of reference values is established, the reason for doing so shall be justified and documented in the record of tests.

6.8 Analysis and Evaluation of Test Results

Note: There is no alert range for the hydraulic parameters associated with centrifugal pumps.

For vertical line shaft pumps, if deviations fall within the alert range of Table 3 (Tables 6.4-2 or 6.4-3), the frequency of testing shall be doubled until the cause of the deviation is determined and the condition corrected.

If deviations fall within the required action range of Table 3 (Tables 6.4-2 or 6.4-3), the pump shall be declared inoperable until the cause of the deviation is determined and the condition corrected.

When a test shows deviations outside of the acceptable range of Table 3 (Tables 6.4-2 or 6.4-3), the instruments involved may be recalibrated and the test rerun.

All test data shall be analyzed within 96 hr after the completion of the test.

Note: The following provision is adopted from ASME OM Code-1995 with OMa-1996 Addenda. The use of any later edition and addenda of Section XI is allowed if it has been incorporated in Paragraph (b)(2) of 10 CFR 50.55a, or if approved by the NRC as an acceptable alternative. At the time of this revision the latest edition of the Code approved for use by the NRC is the ASME OM Code 1995 with OMa-1996 Addenda. All related provisions are satisfied with the exception of adopting the Comprehensive pump test.

In cases where the pump's test parameters are either in the alert or required action ranges of Table 3 (Tables 6.4-2 or 6.4-3), and the pump's continued use at the changed values is supported by an analysis, a new set of reference values may be established. This analysis shall include verification of the pump's operational readiness. The analysis shall include both a pump level and system level evaluation of operational readiness, the cause of the change in pump performance, and an evaluation of all trends indicated by available data. The results of this analysis shall be documented in the record of tests.

6.9 Record of Tests

KNPP shall maintain a record of each test, which shall include the following:

a. pump identification;
b. date of test;
c. reason for test;
d. values of measured parameters;
e. identification of instruments used;
f. comparisons with allowable ranges of test values and analysis of deviations;
g. requirement for corrective action;
h. evaluation and justification for changes to reference values;
i. Signature of the person or persons responsible for conducting and analyzing the test.

7.0 RELIEF REQUESTS

All relief requests applicable to IST of pumps are contained in Appendix A of this document.

8.0 PUMP TEST TABLE

The following table defines the pumps included in the KNPP IST Program and provides pertinent component and test information. The legend below applies to the KNPP Pump Test Table.

8.1 Pump Description: The pump name or description.

8.2 Pump No.: Unique component tag number.

8.3 P&ID: Piping and instrumentation drawing on which the pump is depicted.

8.4 Coord.: Location coordinates of the pump on the P&ID.

8.5 Pump Type: Either horizontal or vertical centrifugal

8.6 Pump Driver: The type of driver providing the motive force for the pump

8.7 Test Parameters: This column lists the applicable testing parameters that will be measured or observed. The parameters listed are those required by the Code. Any deviations from Code required measurements are described in the corresponding relief request. The following is a description of applicable parameters:

a. N = Pump speed (only required for variable speed pumps)

b. D/P = Pump differential pressure

c. P = Pump discharge pressure

d. Q = Pump flow rate

e. V = Vibration velocity

8.8 Code Class: ASME Code Classification of each pump.

8.9 Relief Request: Lists the identifying numbers of any applicable pump relief requests.

8.10 Test Procedure: This column lists the applicable pump IST Procedure.

8.11 Remarks: Any additional pertinent information is provided in this space.

PUMP NO *PID NO* *COORD*	PUMP DESCRIPTION *SYSTEM NAME* *Code Class*	*PUMP* *Type* *Driver*	TEST PARAMETER	RELIEF REQUESTS	TEST PROCEDURE	REMARKS
AFWP-1A *M-205* *H-8*	**Motor Driven AFW Pump 1A** *Auxiliary Feedwater* *3*	*Horiz. Centri.* *Motor*	DP Q V	PRR-02	SP-05B-283A SP-05B-283A SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations. Operability testing may be performed per SP 05B-334A.
AFWP-1B *M-205* *H-6*	**Motor Driven AFW Pump 1B** *Auxiliary Feedwater* *3*	*Horiz. Centri.* *Motor*	DP Q V	PRR-02	SP-05B-283B SP-05B-283B SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations. Operability testing may be performed per SP 05B-334B.
AFWP-1C *M-205* *H-9*	**Turbine Driven AFW Pump C** *Auxiliary Feedwater* *3*	*Horiz. Centri.* *Turbine*	DP Q V N	PRR-02	SP-05B-284 SP-05B-284 SP-55-177 SP-05B-284	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations. Operability testing may be performed per SP 05B-333..
CCP-1A *XK-100-19* *B-6*	**Component Cooling Water Pump** *Component Cooling Water* *3*	*Horiz. Centri.* *Motor*	DP Q V	PRR-01	SP-31-168A SP-31-168A SP-55-177	See KAP-622 for instrument uncertainties

PUMP NO *PID NO* *COORD*	PUMP DESCRIPTION *SYSTEM NAME* *Code Class*	*PUMP* *Type* *Driver*	TEST PARAMETER	RELIEF REQUESTS	TEST PROCEDURE	REMARKS
CCP-1B *XK-100-19* *C-6*	**Component Cooling Water Pump** *Component Cooling Water* *3*	*Horiz. Centri.* *Motor*	DP Q V	PRR-01	SP-31-168B SP-31-168B SP-55-177	See KAP-622 for instrument uncertainties
ICSP-1A *M-217* *F-8*	**Internal Containment Spray Pump** *Internal Containment Spray* *2*	*Horiz. Centri.* *Motor*	DP Q V		SP-23-100A SP-23-100A SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
ICSP-1B *M-217* *E-8*	**Internal Containment Spray Pump** *Internal Containment Spray* *2*	*Horiz. Centri.* *Motor*	DP Q V		SP-23-100B SP-23-100B SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
RHRP-1A *XK-100-18* *F-6*	**Residual Heat Removal Pump** *Residual Heat Removal* *2*	*Horiz. Centri.* *Motor*	DP Q V	PRR-02	SP-34-099A/285 SP-34-099A/285 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations

PUMP NO *PID NO* *COORD*	PUMP DESCRIPTION *SYSTEM NAME* *Code Class*	*PUMP* *Type* *Driver*	TEST PARAMETER	RELIEF REQUESTS	TEST PROCEDURE	REMARKS
RHRP-1B *XK-100-18* *G-6*	**Residual Heat Removal Pump** *Residual Heat Removal* 2	*Horiz. Centri.* *Motor*	DP Q V	PRR-02	SP-34-099B/285 SP-34-099B/285 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
SIP-1A *XK-100-29* *B-6*	**Safety Injection Pump** *Safety Injection* 2	*Horiz. Centri.* *Motor*	DP Q V		SP-33-098A/191 SP-33-098A/191 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
SIP-1B *XK-100-29* *B-6*	**Safety Injection Pump** *Safety Injection* 2	*Horiz. Centri.* *Motor*	DP Q V		SP-33-098B/191 SP-33-098B/191 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
SWP-1A1 *M-202-1* *F-10*	**Service Water Pump** *Service Water* 3	*Vert. Centri.* *Motor*	DP Q V	PRR-01	SP-02-138 SP-02-138 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations

PUMP NO *PID NO* *COORD*	**PUMP DESCRIPTION** *SYSTEM NAME* *Code Class*	*PUMP* *Type* *Driver*	TEST PARAMETER	RELIEF REQUESTS	TEST PROCEDURE	REMARKS
SWP-1A2 *M-202-1* *F-7*	**Service Water Pump** *Service Water* *3*	*Vert. Centri.* *Motor*	DP Q V	PRR-01	SP-02-138 SP-02-138 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
SWP-1B1 *M-202-1* *F-5*	**Service Water Pump** *Service Water* *3*	*Vert. Centri.* *Motor*	DP Q V	PRR-01	SP-02-138 SP-02-138 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations
SWP-1B2 *M-202-1* *F-7*	**Service Water Pump** *Service Water* *3*	*Vert. Centri.* *Motor*	DP Q V	PRR-01	SP-02-138 SP-02-138 SP-55-177	Refer to KAP 97-622 and 96-139 for instrument uncertainty determinations

9.0 VALVE IST PROGRAM

NOTE: A more comprehensive discussion pertaining to valve selection criteria can be found in the IST Basis Document.

9.1 Valve Selection Criteria and Exemptions

9.1.1 The basic scope of the IST Program for valves is defined in Paragraph 1.1 of ASME OMa-1988, Part 10. Paragraph 1.1 requires IST of all active and passive valves (and their actuating and position indicating systems) that are required to perform a specific function in shutting down the reactor to a safe shutdown condition, in maintaining the safe shutdown condition or in mitigating the consequences of an accident. Paragraph 1.1 also specifies that relief devices within the scope of the Code are those protecting systems or portion of systems that perform a required function in shutting down the reactor to a safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident. OM-1987, Part 1 provides additional scoping discussion as well as IST requirements for pressure relief devices.

9.1.2 Skid-mounted valves and component subassemblies are excluded from the requirements of the OM Code provided they are tested as part of the major component and are determined by the Owner to be adequately tested. This position is supported by NUREG-1482, Section 3.4 and OM Code 1995 Subsection ISTC.

9.1.3 ASME non-Code Class components, as discussed in Position 11 of GL 89-04, Attachment 1, may still be subject to periodic testing in accordance with 10 CFR 50 Appendix A and Appendix B. The bases for exclusion or reason for testing non-Code components is contained in the KNPP IST Program Basis Document. Non-Code classed components which require testing are outside the scope of 10 CFR 50.55a and are included in the IST program as Augmented components.

9.1.4 Dampers are exempt from the ASME Code testing requirements.

9.1.5 Valves used only for operating convenience (such as vent, drain, instrument and test valves) are exempt.

9.1.6 Valves only for system control (such as pressure regulating, temperature control, flow control valves) without a safety related fail-safe function are exempt.

9.1.7 Valves used only for system or component maintenance are exempt.

9.2 Valve Testing Frequency

9.2.1 The valve IST frequency will be as set forth in paragraphs 4.2.1.1, 4.2.2.3(a), 4.3, 4.3.2.1 and 4.4.2 of OM-10. Where Code required quarterly valve tests are impractical or otherwise undesirable, testing may be deferred to cold shutdown periods as permitted by paragraphs 4.2.1.2(b) and 4.2.1.2(c) for Category A and B valves and 4.3.2.2(b) and 4.3.2.2(c) for check valves. If it is determined that testing be completed on a refueling outage frequency, testing may be deferred to refueling outages as permitted by paragraphs 4.2.1.2(d) and 4.2.1.2(e) for power operated valves and 4.3.2.2(d) and 4.3.2.2(e) for check valves. Valve testing which is performed during cold shutdowns and refueling outages shall be conducted in accordance with the requirements of paragraphs 4.2.1.2 and 4.3.2.2 in their entirety along with the guidance provided in NUREG-1482, Sections 2.4.5 and 3.1.1. Justifications for deferral of testing to cold shutdowns and refueling outages are provided in Appendices C and D of this document.

9.2.2 As a general rule, the KNPP Technical Specifications do not specify operability requirements for systems and components when the reactor is not critical. However, valve testing shall be performed as stipulated in Code paragraphs 4.2.1 and 4.3.2, during shutdown periods unless the valve is in a system which is inoperable or not required to be operable. If the quarterly testing frequency is not followed, valve testing shall be performed within the 3 months before the system is returned to operable status as required by paragraphs 4.2.1.7 for Category A and B valves and 4.3.2.5 for check valves.

9.3 Valve Test Requirements

Active and passive valves in the categories defined in paragraph 1.4 shall be tested in accordance with the paragraphs specified in Table 1.

9.3.1 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 the use of flowmeters 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.

9.3.2 Valve Stroke Time Testing

Power operated valve stroke time testing shall be performed in accordance with the requirements of paragraph 4.2, of the Code, in its entirety. The stroke time of all power operated valves shall be measured to at least the nearest second. As an alternative, stroke time of power operated valves may be measured to the nearest tenth of a second.

9.3.3 Stroke Time Acceptance Criteria

Test results shall be compared to the initial reference values or reference values established during baseline testing. Table 9.3-1 identifies an acceptable range for stroke timing as well as owner specified limited values of full stroke time. KNPP normally utilizes the acceptable range as the limiting value of full stroke time. The range specified as limiting value of full stroke shall be applied if deviating from the current conservative value. Additionally, if a power operated valve has a design stroke time for accident response which is more restrictive than the limiting value multiplier below, then the design stroke time shall serve as the limiting value.

Table 9.3-1
Allowable Ranges for Valve Stroke Timing

Valve Type	Reference Value	Acceptable Range	Limiting Value[1]
Motor Operated	t_r >10sec t_r ≤10sec	$0.85t_r$ to 1.15 t_r $0.75t_r$ to 1.25 t_r (or ±1 sec whichever is greater)	1.3 t_r 1.5 t_r
Other Power Operated Valves	t_r >10sec	$0.75t_r$ to 1.25 t_r	1.5 t_r
Other Power Operated Valves	t_r ≤10sec	$0.50t_r$ to 1.50 t_r	2.0 t_r
All Power Operated Valves	t_r <2sec	≤2sec	≤2sec

t_r – Reference stroke time in seconds

Note:

(1) The multiplier for limiting value of full stroke time (LVST) is Owner specified criteria. If applicable, the design stroke time, as referenced in Tech. Specs. or the accident analysis is more restrictive than the LVST multiplier then the design stroke time shall be used as the LVST.

9.3.4 Valve Obturator Movement

a. For Category A and B valves, the necessary valve disk movement shall be determined by exercising the valve while observing an appropriate indicator, such as indicating lights which signal the required change of disk position, local indication such as a stem to yolk scale, or by observing other evidence, such as changes in system pressure, flow rate, level or temperature which reflects change of disk position.

b. For check valves, the necessary valve disk movement shall be demonstrated by exercising the valve and observing that either the disk travels to the seat on cessation or reversal of flow or opens to the position required to perform its safety function. Full open exercise testing either requires passing the accident flow rate through the check or demonstration that the disk made contact with the bonnet when fully open. If a mechanical exerciser is used to move the disk, the force or torque required to initiate movement (breakaway) shall be measured and recorded. The breakaway force shall not vary by more than 50% from the established reference value.

9.3.5 Manual Valve Exercising

Manual valves within the IST program scope that perform an active safety function shall be exercised through a complete cycle. Exercise testing shall be considered acceptable if valve stem travel exhibits unrestricted movement with no abnormal resistance or binding through one complete cycle. The use of a valve persuader (cheater) for additional mechanical advantage will not invalidate the test, as it is recognized that larger valves may exhibit increased packing friction and/or increased friction associated with the disk to seat interface. In addition, a valve persuader may be used for personnel safety depending on a valve's service application (i.e. main steam). Where practical, process parameters may be utilized to verify obturator movement. However, where process parameters are utilized to verify obturator movement it is not necessary to be performed simultaneous to manual exercising. This testing methodology is consistent with the discussion provided in NUREG-1482, Section 4.4.6.

9.3.6 Fail-Safe Testing

Most solenoid and air operated valves fail to either the open or closed positions upon a loss of actuating power or electrical power due to the design of the actuators. However, only valves that have a safety related fail-safe function shall be tested in accordance with paragraph 4.2.1.6. The fail-safe test requirements specified in the Code shall be considered satisfied during normal exercising of the valve. Valves with fail-safe actuators that receive power from diverse safeguards supply sources shall be exercised from each power supply source.

9.3.7 Valves in Regular Use

Valves which operate in the course of plant operation at a frequency which would satisfy the exercising requirements of the Code need not be additionally exercised, providing the observations otherwise required for testing are made and analyzed during such operation and are recorded in the plant record.

9.3.8 Category A Valve Seat Leakage Testing

a. Category A valves, which are containment isolation valves, shall be tested in accordance with Federal Regulation 10 CFR 50, Appendix J and the KNPP Containment Leak Rate Testing (CLRT) Program. The corrective action requirements of Appendix J also apply in lieu of analysis of leakage rated 4.2.2.3(e) and corrective action 4.2.2.3(f) specified in the Code.

b. Containment isolation valves that also provide a reactor coolant system pressure isolation function shall additionally be tested in accordance with paragraph 4.2.2.3 of the Code.

c. Category A valves, which perform a function other than containment isolation, shall be seat leakage tested to verify their leak tight integrity in accordance with the requirements of paragraph 4.2.2.3 of the Code.

9.3.9 Check Valve Testing

a. Category C check valve exercise testing shall be performed in accordance with the requirements of paragraph 4.3.2 of the Code.

b. If Non-Intrusive Testing (NIT) is utilized, reference values for open and closure tests are not required. However, acceptance criteria shall be determined for the test conditions and a baseline test shall be performed to establish acceptance criteria.

c. As an alternative to Step 9.3.4.b, disassembly each refueling outage or sample disassembly as outlined in ISTC 4.5.4(c) of OMa-1996 to verify operability may be performed.

9.3.10 Safety and Relief Valve Testing

Category C safety and relief valves within the scope of the IST program shall meet the inservice test requirements of OM-1987 Part 1 as implemented by GMP101-01.

9.3.11 Vacuum Breaker Testing

Category C vacuum breakers within the scope of the IST program shall meet the inservice test requirements of OM-1987 Part 1 as implemented by GMP 101-01.

9.3.12 Rupture Disks Testing

Category D rupture disks within the scope of the IST program shall meet the inservice test requirements of OM-1987 Part 1 as implemented by GMP 101-01.

9.3.13 Corrective Action

a. Category A and B Valves

1. If a power operated valve fails to exhibit the required change of disk position or exceeds its limiting value of full stroke time specified in Table 9.3-1 the valve shall be immediately declared inoperable.

2. Power operated valves with measured stroke times which do not meet the acceptance criteria of paragraph 4.2.1.8 and the acceptable ranges specified in Table 9.3-1 shall be immediately retested or declared inoperable. If a valve is retested and the second set of data also 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 in the record of tests.

3. Category A or B 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. Category A or B valve operability based upon analysis shall have the results of the analysis recorded in the record of tests.

5. Prior to returning a repaired or replaced Category A or B valve to service, a test demonstrating satisfactory operation shall be performed. This test shall include a confirmation of baseline reference values or the establishment of new baseline values.

b. Category A or A/C Valves

1. Valves or valve combinations with leakage rates exceeding the Owner specified values shall be declared inoperable and either repaired or replaced. A retest demonstrating acceptable operation shall be performed following any required corrective action before the valve is returned to service.

c. Category C Check Valves

1. If a check valve fails to exhibit the required change of disk position it shall be declared inoperable. A retest showing acceptable performance shall be run following any required corrective action before the valve is returned to service.

d. Category C Overpressure Protection Devices

1. Failures exhibited the testing of overpressure protection devices shall be dispositioned per the requirements of OM-1987, Part 1 or per the alternative test requirement specified in valve relief request VRR-01 contained in the IST Pump and Valve Program.

9.4 Record of Tests

KNPP shall maintain a record of each test which shall include the following:

a. valve identification;
b. date of test;
c. reason for test;
d. values of measured parameters;
e. identification of instruments used;
f. comparisons with allowable ranges of test values and analysis of deviations;
g. requirement for corrective action;
h. Signature of the person or persons responsible for conducting and analyzing the test

10.0 RELIEF REQUESTS

All relief requests applicable to IST of valves are contained in Appendix B of this document.

11.0 VALVE TEST TABLES

The following table defines the valves included in the KNPP IST Program and provides pertinent component and test information. The legend below applies to the KNPP Valve Test Table.

11.1 Valve Description: The valve name or description.

11.2 Valve No.: Unique component tag number.

11.3 P&ID: Piping and instrumentation drawing on which the pump is depicted.

11.4 Coord.: Location coordinates of the pump on the P&ID.

11.5 Code Class, Cat.: ASME Code Classification of each valve and the Code Valve Category.

11.6 Valve Type, Size and Actuator: defined in valve table Codes

11.7 Positions: The normal valve position, its safety position and its fail-safe position (if applicable).

11.8 Active-Passive: Defines whether the valve performs active (A) or passive (P) safety functions, or no safety function (N) in the open and closed positions.

11.9 Req. Test/Freq: The Code required tests for each valve and the frequency at which these tests are performed.

11.10 TP/TJ/CSJ/ROJ/RR: Listing for each valve of applicable technical positions, technical justifications, cold shutdown justifications, refueling outage justifications, and/or relief requests.

11.6 Test Procedure: This column lists the applicable valve IST Procedure.

VALVE TABLE CODES

VALVE TYPE

BL	Ball
BTF	Butterfly
CK	Check
DI	Diaphragm
DMP	Damper
GL	Globe
GT	Gate
NDL	Needle
RD	Rupture Disk
SCK	Stop Check
SOL	Solenoid
SRV	Safety/Relief
VB	Vacuum Breaker

ACTUATOR TYPE

AO	Air Operator
SO	Solenoid Operator
MO	Motor Operator
MA	Manual Operator
SA	Self Actuated

VALVE POSITIONS

AI	As Is
O	Open
C	Closed
OC	Open and Closed
PO	Partial Open
TH	Throttled

TEST FREQUENCY

Q	Quarterly
CS	Cold Shutdown
CU	Continuous Use
R	Refueling
2Y	Two Years
5Y	Five Years
10Y	Ten Years

TEST REQUIREMENTS*

INSP	Check valve disassembly and inspection.
ST	Power operated valve stroke time test.
ET	Power operated valve exercise test.
FSM	Manual valve full-stroke exercise.
FST	Fail-safe test.
PIT	Remote position indication verification.
CV	Check valve exercise test.
SKID	Skid mounted component
NIT	Non-intrusive testing
RVT	Safety and relief valve tests.
SLT-1	10CFR50, Appendix J, Type C, valve seat leakage test.
SLT-2	PIV seat leakage test.
SLT-3	Seat leakage test for good engineering judgement

* An "A" preceding the test requirement signifies a component requiring an Augmented test(s).

INSERVICE TESTING PROGRAM- IA / SA VALVE TEST TABLE

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
IA-102 *M-213-6* *B-3*	**Instrument Air to Reactor Bldg Pen 20** *Instrument Air* *NCC AC*	*CK* *2* *SA*	*O*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-05	SP-56A-090 SP-56A-090
IA-103 *M-213-6* *B-4*	**Instrument Air Inside Reactor Bldg Pen 20** *Instrument Air* *NCC AC*	*CK* *2* *SA*	*O*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-05	SP-56A-090 SP-56A-090
SA-471 *M-213* *A-2*	**Reactor Bldg Pen 19 for Station Air Stop Check** *Service Air* *NCC AC*	*SCK* *2* *MA*	*C*	*C*	*N/A*	*N*	*P*	ASLT-1		SP-56A-090
SA-471-1 *M-213* *A-2*	**Reactor Bldg Pen 19 for Station Air (Outside) Manual Valve** *Service Air* *NCC A*	*GL* *0.75* *MA*	*C*	*C*	*N/A*	*N*	*P*	ASLT-1		SP-56A-090
SA-471-2 *M-213* *A-2*	**Reactor Bldg Pen 19 for Station Air (Outside) Manual Valve** *Service Air* *NCC A*	*GL* *0.75* *MA*	*C*	*C*	*N/A*	*N*	*P*	ASLT-1		SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-472 *M-213* *A-2*	**Reactor Bldg Pen 19 for Station Air Stop Check** *Service Air* *NCC AC*	*SCK* *2* *MA*	*C*	*C*	*N/A*	*N*	*P*	ASLT-1		SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-10A *M-202-2* *A-10*	**Aux Bldg SW Header "A" Isolation Valve** *Service Water* *3 B*	*BTF* *16* *MO*	*O*	*O*	*N/A*	*P*	*N*	PIT(2Y)		SP-87-274
SW-10B *M-202-2* *A-10*	**Aux Bldg SW Header "B" Isolation Valve** *Service Water* *3 B*	*BTF* *16* *MO*	*O*	*O*	*N/A*	*P*	*N*	PIT(2Y)		SP-87-274
SW-1300A *M-202-2* *C-11*	**SW from CCHX 1A Motor Operated Valve** *Service Water* *3 B*	*GL* *10* *MO*	*C*	*O*	*AI*	*A*	*N*	ET-(Q) ST-O(Q) PIT(2Y)		SP-31-168A SP-31-168A SP-87-274
SW-1300B *M-202-2* *C-9*	**SW from CCHX 1B Motor Operated Valve** *Service Water* *3 B*	*GL* *10* *MO*	*C*	*O*	*AI*	*A*	*N*	ET-(Q) ST-O(Q) PIT(2Y)		SP-31-168B SP-31-168B SP-87-274
SW-1306A *M-202-2* *C-11*	**Temp CTRL SW CCHX 1A Bypass Control Valve** *Service Water* *3 B*	*GL* *4* *AO*	*TH*	*O*	*O*	*A*	*N*	ET-(Q) ST-O(Q) FST-O(Q) PIT(2Y)		SP-31-168A SP-31-168A SP-31-168A SP-87-273

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-1306B M-202-2 C-9	**Temp CTRL SW CCHX 1B Bypass Control Valve** Service Water 3 B	GL 4 AO	TH	O	O	A	N	ET-(Q) ST-O(Q) FST-O(Q) PIT(2Y)		SP-31-168B SP-31-168B SP-31-168B SP-87-273
SW-1400 X-K100-19 B-3	**Emergency Makeup to Component Cooling** Service Water 3 B	GL 2 MO	C	O	AI	A	P	ET(Q) ST-O(Q) PIT(2Y)		SP-31-168B SP-31-168B SP-87-274
SW-1497 M-218 A-11	**Emergency Service Wtr to Spent Fuel Pool Manual Isolation Valve** Service Water 3 B	GT 6 MA	C	O	N/A	A	N	FSM(2Y)	VRR-03	
SW-1501 M-218 A-10	**Emergency Service Water to Spent Fuel Pools Check Valve** Service Water 3 C	CK 6	C	O	N/A	A	N	CV-O(R)	VRR-03	INSP-PM
SW-1A1 M-202-1 F-9	**SW Pump 1A1 Discharge Check Valve** Service Water 3 C	CK 14 SA	O	OC	N/A	A	A	CV-O(R) ACV-C(Q)	TP-07	GMP-155 SP-02-138A

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-1A2 *M-202-1* *F-7*	**SW Pump 1A2 Discharge Check Valve** *Service Water* *3 C*	*CK* *14* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-O(R) ACV-C(Q)	TP-07	GMP-155 SP-02-138A
SW-1B1 *M-202-1* *F-9*	**SW Pump 1B1 Discharge Check Valve** *Service Water* *3 C*	*CK* *14* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-O(R) ACV-C(Q)	TP-07	GMP-155 SP-02-138B
SW-1B2 *M-202-1* *F-2*	**SW Pump 1B2 Discharge Check Valve** *Service Water* *3 C*	*CK* *14* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-O(R) ACV-C(Q)	TP-07	GMP-155 SP-02-138B
SW-301A *M-201-1* *C-3*	**SW from D/G Oil Cooler Control Valve** *Service Water* *3 B*	*BL* *4* *AO*	*C*	*O*	*O*	*A*	*N*	ET(Q) ST-O(Q) FST-O(Q)		SP-42-47A/312A SP-42-47A/312A SP-42-47A/312A
SW-301B *M-201-1* *C-1*	**SW from D/G Oil Cooler Control Valve** *Service Water* *3 B*	*BL* *4* *AO*	*C*	*O*	*O*	*A*	*N*	ET(Q) ST-O(Q) FST-O(Q)		SP-42-47B/312B SP-42-47B/312B SP-42-47B/312B

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	*Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-3A *M-202-1* *E-6*	**SW Header "A" Isolation Control Valve** *Service Water* *3 B*	*BTF* *24* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-273
SW-3B *M-202-1* *E-5*	**SW Header "B" Isolation Control Valve** *Service Water* *3 B*	*BTF* *24* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-273
SW-4A *M-201-1* *A-2*	**Service Water to Turbine Building Control Valve** *Service Water* *3 B*	*BTF* *20* *AO*	*OC*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-02-138A/B SP-02-138A/B SP-87-273
SW-4B *M-201-1* *A-1*	**Service Water to Turbine Building Control Valve** *Service Water* *3 B*	*BTF* *20* *AO*	*OC*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-02-138A/B SP-02-138A/B SP-87-273
SW-501A *M-202-2* *F-12*	**Service Water Hdr "A" Supply to Turbine Driven Auxiliary Feedwater Pump Check Valve** *Service Water* *3 C*	*CK* *3* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(Q) CV-O(R) CV-C(R)	 ROJ-14	SP-05B-284 GMP-147 GMP-147

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-501B	**Service Water Hdr "B" Supply to Turbine Driven Auxiliary Feedwater Pump Check Valve**							CV-PO(Q)		SP-05B-284
M-202-2	*Service Water*	*CK* *3*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R) CV-C(R)	ROJ-14	GMP-147 GMP-147
F-12	*3 C*	*SA*								
SW-502	**Service Water Supply to Turbine Driven Auxiliary Feedwater Pump Isolation Valve**							ET-(Q) ST-O(Q)		SP-05B-284 SP-05B-284
M-202-2	*Service Water*	*GT* *3*	*C*	*O*	*AI*	*A*	*N*	PIT(2Y)		SP-87-274
E-12	*3 B*	*MO*								
SW-6010	**Service Water to Connections in Containment Vessel**							ASLT-1		SP-56A-090
M-202-2	*Service Water*	*GL* *2*	*C*	*C*	*N/A*	*N*	*P*			
B-4	*NCC A*	*MA*								
SW-6011	**Pen 24 to Hose Stations check Valve**							ASLT-1		SP-56A-090
M-202-2	*Service Water*	*CK* *2*	*C*	*C*	*N/A*	*N*	*P*			
B-3	*NCC AC*	*SA*								
SW-601A	**Service Water Supply to Motor Driven Auxiliary Feedwater Pump "A" Isolation Valve**							ET-(Q) ST-O(Q)		SP-05B-283A SP-05B-283A
M-202-2	*Service Water*	*GT* *3*	*C*	*O*	*AI*	*A*	*N*	PIT(2Y)		SP-87-274
E-11	*3 B*	*MO*								

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-601B	**Service Water Supply to Motor Driven Auxiliary Feedwater Pump "B" Isolation Valve**							ET-(Q) ST-O(Q) PIT(2Y)	CSJ-20	SP-05B-283B SP-05B-283B SP-87-274
M-202-2	*Service Water*	*GT* *3*	*C*	*O*	*AI*	*A*	*N*			
E-10	*3 B*	*MO*								
SW-900A	**Cntmt Fan Coil Unit 1A Inlet Manual Isolation Valve**							FSM(2Y)	TP-06	SP-55-167-12
M-547	*Service Water*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
G-9	*3 B*	*MA*								
SW-900B	**Cntmt Fan Coil Unit 1B Inlet Manual Isolation Valve**							FSM(2Y)	TP-06	SP-55-167-12
M-547	*Service Water*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
H-8	*3 B*	*MA*								
SW-900C	**Cntmt Fan Coil Unit 1C Inlet Manual Isolation Valve**							FSM(2Y)	TP-06	SP-55-167-12
M-547	*Service Water*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
F-9	*3 B*	*MA*								
SW-900D	**Cntmt Fan Coil Unit 1D Inlet Manual Isolation Valve**							FSM(2Y)	TP-06	SP-55-167-12
M-547	*Service Water*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
G-9	*3 B*	*MA*								

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-901A	**Supply to Containment Fan Coil Unit 1A Check Valve**							CV-O(Q)		SP-02-138A
M-547	*Service Water*	*CK*	*O*	*O*	*N/A*	*A*	*N*			
G-6	*3 C*	*8* / *SA*								
SW-901A-1	**SW Header 1A Shroud Cooling Coil A/B Bypass Control Valve**							ET(Q) ST-O(Q) FS-O(Q) PIT(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-273
M-547	*Service Water*	*GL*	*TH*	*O*	*O*	*A*	*N*			
B-4	*3 B*	*8* / *AO*								
SW-901B	**Supply to Containment Fan Coil Unit 1B Check Valve**							CV-O(Q)		SP-02-138
M-547	*Service Water*	*CK*	*O*	*O*	*N/A*	*A*	*N*			
H-6	*3 C*	*8* / *SA*								
SW-901B-1	**SW Header 1B Shroud Cooling Coil A/B Bypass Control Valve**							ET(Q) ST-O(Q) FS-O(Q) PIT(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-273
M-547	*Service Water*	*GL*	*TH*	*O*	*O*	*A*	*N*			
A-4	*3 B*	*8* / *AO*								
SW-901C	**Supply to Containment Fan Coil Unit 1C Check Valve**							CV-O(Q)		SP-02-138B
M-547	*Service Water*	*CK*	*O*	*O*	*N/A*	*A*	*N*			
F-6	*3 C*	*8* / *SA*								

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-901C-1 M-547 E-4	SW Header 1C Shroud Cooling Coil C/D Bypass Control Valve Service Water 3 B	GL 8 AO	TH	O	O	A	N	ET(Q) ST-O(Q) FS-O(Q) PIT(2Y)		SP-02-138B SP-02-138B SP-02-138B SP-87-273
SW-901D M-547 G-6	Supply to Containment Fan Coil Unit 1D Check Valve Service Water 3 C	CK 8 SA	O	O	N/A	A	N	CV-O(Q)		SP-02-138B
SW-901D-1 M-547 C-4	SW Header 1D Shroud Cooling Coil C/D Bypass Control Valve Service Water 3 B	GL 8 AO	TH	O	O	A	N	ET(Q) ST-O(Q) FST-O(Q) PIT(2Y)		SP-02-138B SP-02-138B SP-02-138B SP-87-273
SW-903A M-547 B-9	Cntmt Clg SW Return Header 1A Motor Operated Isolation Valve Service Water 3 B	GT 8 MO	O	OC	N/A	A	A	ET(Q) ST-O(Q) ST-C(Q) PIT-(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-274
SW-903B M-547 A-9	Cntmt Clg SW Return Header 1B Motor Operated Isolation Valve Service Water 3 B	GT 8 MO	C	OC	N/A	A	A	ET(Q) ST-O(Q) ST-C(Q) PIT-(2Y)		SP-02-138A SP-02-138A SP-02-138A SP-87-274

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-903C *M-547* *E-10*	**Cntmt Clg SW Return Header 1C Motor Operated Isolation Valve** *Service Water* *3 B*	*GT* *8* *MO*	*O*	*OC*	*N/A*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT-(2Y)		SP-02-138B SP-02-138B SP-02-138B SP-87-274
SW-903D *M-547* *C-9*	**Cntmt Clg SW Return Header 1D Motor Operated Isolation Valve** *Service Water* *3 B*	*GT* *8* *MO*	*O*	*OC*	*N/A*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT-(2Y)		SP-02-138B SP-02-138B SP-02-138B SP-87-274
SW-905A *M-547* *F-9*	**Containment FCU SW Bypass Line Manual Valve** *Service Water* *3 B*	*GL* *0.5* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(2Y)	TP-06	SP-55-167-12
SW-905B *M-547* *F-9*	**Containment FCU SW Bypass Line Manual Valve** *Service Water* *3 B*	*GL* *0.5* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(2Y)	TP-06	SP-55-167-12
SW-905C *M-547* *F-9*	**Containment FCU SW Bypass Line Manual Valve** *Service Water* *3 B*	*GL* *0.5* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(2Y)	TP-06	SP-55-167-12

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-905D *M-547* *F-9*	**Containment FCU SW Bypass Line Manual Valve** *Service Water* *3 B*	*GL* *0.5* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(2Y)	TP-06	SP-55-167-12
SW-910A *M-547* *B-2*	**Shroud Cooling Coil A/B Supply from Header 1A Control Valve** *Service Water* *3 B*	*GT* *3* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)	TP-03	SP-02-138A SP-02-138A SP-02-138A SP-87-273
SW-910B *M-547* *A-2*	**Shroud Cooling Coil A/B Supply from Header 1B Control Valve** *Service Water* *3 B*	*GT* *3* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)	TP-03	SP-02-138A SP-02-138A SP-02-138A SP-87-273
SW-910C *M-547* *D-3*	**Shroud Cooling Coil C/D Supply from Header 1C Control Valve** *Service Water* *3 B*	*GT* *3* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)	TP-03	SP-02-138B SP-02-138B SP-02-138B SP-87-273
SW-910D *M-547* *C-3*	**Shroud Cooling Coil C/D Supply from Header 1D Control Valve** *Service Water* *3 B*	*GT* *3* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)	TP-03	SP-02-138B SP-02-138B SP-02-138B SP-87-273

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-914A	**Shroud Cooling Coil A/B Discharge to Header 1A Control Valve**							ET(Q)		SP-02-138A
M-547	Service Water	GT	O	C	C	N	A	ST-C(Q)	TP-03	SP-02-138A
B-5	3 B	3						FST-C(Q)		SP-02-138A
		AO						PIT(2Y)		SP-87-273
SW-914B	**Shroud Cooling Coil A/B Discharge to Header 1B Control Valve**							ET(Q)		SP-02-138A
M-547	Service Water	GT	O	C	C	N	A	ST-C(Q)	TP-03	SP-02-138A
A-5	3 B	3						FST-C(Q)		SP-02-138A
		AO						PIT(2Y)		SP-87-273
SW-914C	**Shroud Cooling Coil A/B Discharge to Header 1C Control Valve**							ET(Q)		SP-02-138B
M-547	Service Water	GT	O	C	C	N	A	ST-C(Q)	TP-03	SP-02-138B
E-6	3 B	3						FST-C(Q)		SP-02-138B
		AO						PIT(2Y)		SP-87-273
SW-914D	**Shroud Cooling Coil A/B Discharge to Header 1D Control Valve**							ET(Q)		SP-02-138B
M-547	Service Water	GT	O	C	C	N	A	ST-C(Q)	TP-03	SP-02-138B
C-6	3 B	3						FS-C(Q)		SP-02-138B
		AO						PIT(2Y)		SP-87-273

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	POSITIONS Safety	POSITIONS Failsafe	ACTIVE-PASSIVE Open A/P/N	ACTIVE-PASSIVE Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
FW-10A *M-205* *C-5*	**Control Station Bypass to S/G 1A Control Valve** *Feedwater* *NCC B*	*GA* *4* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y)	TJ-13 TJ-13 TJ-13 TP-05	SP-05A-202 SP-05A-202 SP-05A-202 SP-05A-202
FW-10B *M-205* *B-5*	**Control Station Bypass to S/G 1B Control Valve** *Feedwater* *NCC B*	*GA* *4* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y)	TJ-13 TJ-13 TJ-13 TP-05	SP-05A-202 SP-05A-202 SP-05A-202 SP-05A-202
FW-12A *M-205* *C-4*	**S/G B Feedwater Isol Valve** *Feedwater* *2 B*	*GT* *16* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-11 CSJ-11	SP-55-167-8 SP-55-167-8 SP-87-274
FW-12B *M-205* *A-4*	**S/G B Feedwater Isol Valve** *Feedwater* *2 B*	*GT* *16* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-11 CSJ-11	SP-55-167-8 SP-55-167-8 SP-87-274
FW-13A *M-205* *B-2*	**Feedwater Pump Discharge Check Valve at S/G A** *Feedwater* *2 C*	*CK* *16* *SA*	*O*	*C*	*N/A*	*N*	*A*	CV-C(CS)	CSJ-12	SP-55-167-8

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
FW-13B M-205 H-9	**Feedwater Pump Discharge Check Valve at S/G B** Feedwater 2 C	CK 16 SA	O	C	N/A	N	A	CV-C(CS)	CSJ-12	SP-55-167-8
FW-7A M-205 C-7	**Control Station to S/G 1A Control Valve** Feedwater NCC B	GA 12 AO	O	C	C	N	A	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y)	TJ-14 TJ-14 TJ-14 TP-05	SP-05A-202 SP-05A-202 SP-05A-202 SP-05A-202
FW-7B M-205 B-4	**Control Station to S/G 1B Control Valve** Feedwater NCC B	GL 12 AO	O	C	C	N	A	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y)	TJ-14 TJ-14 TJ-14 TP-05	SP-05A-202 SP-05A-202 SP-05A-202 SP-05A-202

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
AFW-10A *M-205* *G-7*	**Aux FW Pump 1A Disch Crossover MV** *Auxiliary Feedwater* *2 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-05B-283A/B SP-05B-283A/B SP-87-274
AFW-10B *M-205* *G-7*	**Aux FW Pump 1B Disch Crossover MV** *Auxiliary Feedwater* *2 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-05B-283B/A SP-05B-283B/A SP-87-274
AFW-1A *M-205* *G-8*	**Auxiliary Feedwater Pump 1A Discharge Check Valve** *Auxiliary Feedwater* *3 C*	*CK* *3* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q)		SP-05B-283A SP-05B-284
AFW-1B *M-205* *G-8*	**Auxiliary Feedwater Pump 1B Discharge Check Valve** *Auxiliary Feedwater* *3 C*	*CK* *3* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q)		SP-05B-283B SP-05B-284
AFW-1C *M-205* *G-8*	**Turbine Driven Aux FW Pump Discharge Check Valve** *Auxiliary Feedwater* *3 C*	*CK* *3* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q)		SP-05B-284 SP-05B-283A

VALVE NO / *PID NO* / *COORD*	VALVE DESCRIPTION / *SYSTEM NAME* / *Code: Class Cat*	*VALVE* / *Type* / *Size (In.)* / *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	*Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
AFW-4A	**Auxiliary Feedwater Pump Discharge Check Valve To S/G 1A**							CV-O(Q) CV-C(CU)		SP-05B-283A NAO Logs
M-205	*Auxiliary Feedwater*	*CK* *3*	*C*	*OC*	*N/A*	*A*	*A*			
C-2	*2 C*	*SA*								
AFW-4B	**Auxiliary Feedwater Pump Discharge Check Valve To S/G 1B**							CV-O(Q) CV-C(CU)		SP-05B-283B NAO Logs
M-205	*Auxiliary Feedwater*	*CK* *3*	*C*	*OC*	*N/A*	*A*	*A*			
C-3	*2 C*	*SA*								
MU-301	**Condensate Storage Tank to Aux Feedwater Check Valve**							ACV-O(Q) ACV-O(Q)		SP-05B-283A/B SP-05B-284
M-205	*Auxiliary Feedwater*	*CK* *6*	*C*	*N/A*	*N/A*	*N*	*N*			
H-5	*NCC C*	*SA*								
MU-311A	**Auxiliary Feedwater Pump 1A Inlet Check Valve**							CV-C(R) ACV-O(Q)	ROJ-08	GMP-147 SP-05B-283A
M-205	*Auxiliary Feedwater*	*CK* *4*	*C*	*C*	*N/A*	*N*	*A*			
H-7	*3 C*	*SA*								
MU-311B	**Auxiliary Feedwater Pump 1B Inlet Check Valve**							CV-C(R) ACV-O(Q)	ROJ-08	GMP-147 SP-05B-283B
M-205	*Auxiliary Feedwater*	*CK* *4*	*C*	*C*	*N/A*	*N*	*A*			
H-6	*3 C*	*SA*								

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MU-311C	**Turbine Driven Aux Feedwater Pump Inlet Check Valve**							CV-C(R) ACV-O(Q)	ROJ-08	GMP-147 SP-05B-284
M-205	*Auxiliary Feedwater*	*CK* *4*	*C*	*C*	*N/A*	*N*	*A*			
H-9	*3 C*	*SA*								
MU-320A	**Auxiliary Feedwater Pump 1A Inlet Relief Valve**							RVT(10Y)		PMP03-08
M-205	*Auxiliary Feedwater*	*SRV* *1*	*C*	*OC*	*N/A*	*A*	*P*			
H-8	*3 C*	*SA*								
MU-320B	**Auxiliary Feedwater Pump 1B Inlet Relief Valve**							RVT(10Y)		PMP03-08
M-205	*Auxiliary Feedwater*	*SRV* *1*	*C*	*OC*	*N/A*	*A*	*P*			
H-6	*3 C*	*SA*								
MU-320C	**Turbine Driven Aux Feedwater Pump (Inlet) Relief Valve**							RVT(10Y)		PMP03-08
M-205	*Auxiliary Feedwater*	*SRV* *1*	*C*	*OC*	*N/A*	*A*	*P*			
H-9	*3 C*	*SA*								

INSERVICE TESTING PROGRAM- MS VALVE TEST TABLE

VALVE NO / *PID NO* / *COORD*	VALVE DESCRIPTION / *SYSTEM NAME* / *Code: Class Cat*	*VALVE* / *Type* / *Size (In.)* / *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	*Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MS-100A *M-203* *F-3*	**S/G 1A Stm Supply to T/D AFW Pump** *Main Steam* *2 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-05B-284 SP-05B-284 SP-87-274
MS-100B *M-203* *C-4*	**S/G 1B Stm Supply to T/D AFW Pump** *Main Steam* *2 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-05B-284 SP-05B-284 SP-87-274
MS-101A *M-203* *G-4*	**Steam at Turbine Driven Aux FW Pump 1A** *Main Steam* *2 C*	*GT* *3* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-05B-284
MS-101B *M-203* *G-4*	**Steam at Turbine Driven Aux FW Pump 1B** *Main Steam* *2 C*	*GT* *3* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-05B-284
MS-102 *M-203* *H-4*	**T/D AFW Pump Main Steam Isol** *Main Steam* *3 B*	*GL* *3* *MO*	*C*	*O*	*N/A*	*A*	*N*	ET(Q) ST-O(Q) PIT(2Y)		SP-05B-284 SP-05B-284 SP-87-274

INSERVICE TESTING PROGRAM- MS VALVE TEST TABLE

VALVE NO / *PID NO* / *COORD*	VALVE DESCRIPTION / *SYSTEM NAME* / *Code: Class Cat*	*VALVE* *Type Size (In.) Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	*Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MS-1A *M-203* *D-4*	**Main Steam Isolation Valve Assembly-Gen 1A** *Main Steam* *2 B/C*	*CK 30 AO*	*O*	*C*	*N/A*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-10 CSJ-10	SP-55-167-8 SP-55-167-8 SP-87-273
MS-1A-1 *M-203* *D-4*	**Main Steam Isolation Valve Assembly-Gen 1A** *Main Steam* *NCC C*	*CK 30 SA*	*O*	*C*	*N/A*	*N*	*A*	ACV-C(R)	TJ-09	PMP 06-08
MS-1B *M-203* *A-4*	**Main Steam Isolation Valve Assembly-Gen 1B** *Main Steam* *2 BC*	*CK 30 AO*	*O*	*C*	*N/A*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-10 CSJ-10	SP-55-167-8 SP-55-167-8 SP-87-273
MS-1B-1 *M-203* *A-4*	**Main Steam Isolation Valve Assembly-Gen 1B** *Main Steam* *NCC C*	*CK 30 SA*	*O*	*C*	*N/A*	*N*	*A*	ACV-C(R)	TJ-09	PMP 06-08
MS-40A *M-203* *D-4*	**Mn Stm Hdr 1A at Isol Vlv Drn to Trap** *Main Steam* *2 B*	*GT 2 MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(2Y)	TP-06	SP 55-167-12

INSERVICE TESTING PROGRAM- MS VALVE TEST TABLE

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MS-40B M-203 A-4	**Mn Stm Hdr 1B at Isol Vlv Drn to Trap** Main Steam 2 B	GL 1 MA	O	C	N/A	N	A	FSM(2Y)	TP-06	SP 55-167-12
SD-1A1 M-203 E-4	**Steam Generator 1A Safety Relief to Atmosphere** Main Steam 2 C	SRV 6 SA	C	OC	N/A	A	A	RVT(5Y)		SP-06-077
SD-1A2 M-203 E-4	**Steam Generator 1A Safety Relief to Atmosphere** Main Steam 2 C	SRV 6 SA	C	OC	N/A	A	A	RVT(5Y)		SP-06-077
SD-1A3 M-203 E-3	**Steam Generator 1A Safety Relief to Atmosphere** Main Steam 2 C	SRV 6 SA	C	OC	N/A	A	A	RVT(5Y)		SP-06-077
SD-1A4 M-203 D-7	**Steam Generator 1A Safety Relief to Atmosphere** Main Steam 2 C	SRV 6 SA	C	OC	N/A	A	A	RVT(5Y)		SP-06-077

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SD-1A5	**Steam Generator 1A Safety Relief to Atmosphere**							RVT(5Y)		SP-06-077
M-203	*Main Steam*	*SRV* *6*	*C*	*OC*	*N/A*	*A*	*A*			
H-6	*2 C*	*SA*								
SD-1B1	**Steam Generator 1B Safety Relief to Atmosphere**							RVT(5Y)		SP-06-077
M-203	*Main Steam*	*SRV* *6*	*C*	*OC*	*N/A*	*A*	*A*			
B-4	*2 C*	*SA*								
SD-1B2	**Steam Generator 1B Safety Relief to Atmosphere**							RVT(5Y)		SP-06-077
M-203	*Main Steam*	*SRV* *6*	*C*	*OC*	*N/A*	*A*	*A*			
B-4	*2 C*	*SA*								
SD-1B3	**Steam Generator 1B Safety Relief to Atmosphere**							RVT(5Y)		SP-06-077
M-203	*Main Steam*	*SRV* *6*	*C*	*OC*	*N/A*	*A*	*A*			
B-4	*2 C*	*SA*								
SD-1B4	**Steam Generator 1B Safety Relief to Atmosphere**							RVT(5Y)		SP-06-077
M-203	*Main Steam*	*SRV* *6*	*C*	*OC*	*N/A*	*A*	*A*			
B-3	*2 C*	*SA*								

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SD-1B5 *M-203* *B-3*	**Steam Generator 1B Safety Relief to Atmosphere** *Main Steam* *2 C*	*SRV* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	RVT(10Y)		SP-06-077
SD-3A *M-203* *E-4*	**Main Stm Controlled Relief Valve - Stm Hdr 1A** *Main Steam* *2 B*	*GL* *6* *AO*	*C*	*OC*	*C*	*A*	*A*	ET(Q) PIT(2Y)	VRR-02	SP-55-167-5 SP-55-167-5
SD-3B *M-203* *B-4*	**Main Stm Controlled Relief Valve - Stm Hdr 1B** *Main Steam* *2 B*	*GL* *6* *AO*	*C*	*OC*	*C*	*A*	*A*	ET(Q) PIT(2Y)	VRR-02	SP-55-167-5 SP-55-167-5

INSERVICE TESTING PROGRAM- BT VALVE TEST TABLE

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	POSITIONS Safety	POSITIONS Failsafe	ACTIVE-PASSIVE Open A/P/N	ACTIVE-PASSIVE Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
BT-2A *M-203* *E-1*	**S/G A Blowdown Isol Valve** *Steam Generator Blowdown* *2 B*	*GL* *2* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y) ASLT-1		SP-55-167-1 SP-55-167-1 SP-87-274 NEP 14.18
BT-2A-1 *M-203* *E-1*	**Blowdown Isolation Valve BT-2A Overpressure Bypass Check** *Steam Generator Blowdown* *2 C*	*CK* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(R) CV-C(R) ASLT-1	ROJ-1 ROJ-1	NEP 14.18 NEP 14.18 NEP 14.18
BT-2B *M-203* *F-1*	**S/G B Blowdown Isol Valve** *Steam Generator Blowdown* *2 B*	*GL* *2* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y) ASLT-1		SP-55-167-1 SP-55-167-1 SP-87-274 NEP 14.18
BT-2B-1 *M-203* *F-1*	**Blowdown Isolation Valve BT-2B Overpressure Bypass Check** *Steam Generator Blowdown* *2 C*	*CK* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(R) CV-C(R) ASLT-1	ROJ-01 ROJ-01	NEP 14.18 NEP 14.18 NEP 14.18
BT-31A *M-219* *B-3*	**S/G 1A Sample Isolation Valve** *Steam Generator Blowdown* *2 B*	*GL* *0.375* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-87-273

INSERVICE TESTING PROGRAM- BT VALVE TEST TABLE

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	*Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
BT-31B *M-219* *B-3*	**S/G 1B Sample Isolation Valve** *Steam Generator Blowdown* *2 B*	*GL* *0.375* *AO*	*O*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-87-273
BT-32A *M-219* *B-3*	**S/G 1A Sample Isolation Valve** *Steam Generator Blowdown* *2 B*	*GL* *0.375* *AO*	*O*	*OC*	*C*	*A*	*A*	ET(Q) ST-C(Q) ST-O(Q) FST-C(Q) PIT(2Y)	TP-02	SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-87-273
BT-32B *M-219* *B-3*	**S/G 1A Sample Isolation Valve** *Steam Generator Blowdown* *2 B*	*GL* *0.375* *AO*	*O*	*OC*	*C*	*A*	*A*	ET(Q) ST-C(Q) ST-O(Q) FST-C(Q) PIT(2Y)	TP-02	SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-55-167-1 SP-87-273
BT-3A *M-203* *E-1*	**S/G A Blowdown Isol Valve** *Steam Generator Blowdown* *2 B*	*GL* *2* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y) ASLT-1		SP-55-167-1 SP-55-167-1 SP-87-274 NEP 14.18
BT-3B *M-203* *F-1*	**S/G B Blowdown Isol Valve** *Steam Generator Blowdown* *2 B*	*GL* *2* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y) ASLT-1		SP-55-167-1 SP-55-167-1 SP-87-274 NEP 14.18

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-2001A-P	**Diesel Gen. Startup Compr. 1A to Pri Air Receiver Check Vlv**							ACV-C(R)	TJ-19	PMP-01-08
M-213-9	*Diesel Generator Mechanical*	*CK* *0.5*	*C*	*C*	*N/A*	*N*	*A*			
A-2	*NCC C*	*SA*								
SA-2001B-P	**Diesel Gen. Startup Compr. 1B to Pri Air Receiver Check Vlv**							ACV-C(R)	TJ-19	PMP-01-08
M-213-9	*Diesel Generator Mechanical*	*CK* *0.5*	*C*	*C*	*N/A*	*N*	*A*			
A-9	*NCC C*	*SA*								
SA-2002A-P	**DG Startup Primary Air Rcvr 1A1 & 1A2 Outlet Check**							Skid		SP-42-047A SP-42-312A
M-213-9	*Diesel Generator Mechanical*	*CK* *1.5*	*C*	*O*	*N/A*	*A*	*N*			
B-2	*NCC C*	*SA*								
SA-2002B-P	**DG Startup Primary Air Rcvr 1B1 & 1B2 Outlet Check**							Skid		SP-42-047B SP-42-312B
M-213-9	*Diesel Generator Mechanical*	*CK* *1.5*	*C*	*O*	*N/A*	*A*	*N*			
B-8	*NCC C*	*SA*								
SA-2005A-1	**Diesel Gen. "A" Startup Air Start Vlv (Set #2)**							Skid		SP-42-047A SP-42-312A
M-213-9	*Diesel Generator Mechanical*	*GL* *0.375*	*C*	*O*	*C*	*A*	*N*			
E-1	*NCC B*	*AO*								

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-2005A-2 *M-213-9* *E-1*	**Diesel Gen. "A" Startup Air Solenoid Vlv (Set #2)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *SO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047A SP-42-312A
SA-2005A-3 *M-213-9* *E-1*	**Diesel Gen. "A" Startup Air Start Motor Check Vlv (Set #2)** *Diesel Generator Mechanical* *NCC C*	*CK* *0.375* *SA*	*C*	*C*	*N/A*	*N*	*P*	Skid		SP-42-047A SP-42-312A
SA-2005B-1 *M-213-9* *E-11*	**Diesel Gen. "B" Startup Air Start Vlv (Set #2)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *AO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047B SP-42-312B
SA-2005B-2 *M-213-9* *E-11*	**Diesel Gen. "B" Startup Air Solenoid Vlv (Set #2)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *SO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047B SP-42-312B
SA-2005B-3 *M-213-9* *E-11*	**Diesel Gen. "B" Startup Air Start Motor Check Vlv (Set #2)** *Diesel Generator Mechanical* *NCC C*	*CK* *0.375* *SA*	*C*	*C*	*N/A*	*N*	*P*	Skid		SP-42-047B SP-42-312B

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	POSITIONS Safety	POSITIONS Failsafe	ACTIVE-PASSIVE Open A/P/N	ACTIVE-PASSIVE Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-2006A-1 *M-213-9* *E-2*	**Diesel Gen. "A" Startup Air Start Vlv (Set #1)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *AO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047A SP-42-312A
SA-2006A-2 *M-213-9* *E-3*	**Diesel Gen. "A" Startup Air Solenoid Vlv (Set #1)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *SO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047A SP-42-312A
SA-2006A-3 *M-213-9* *E-2*	**Diesel Gen. "A" Startup Air Start Motor Check Vlv (Set #1)** *Diesel Generator Mechanical* *NCC C*	*CK* *0.375* *SA*	*C*	*C*	*N/A*	*N*	*P*	Skid		SP-42-047A SP-42-312A
SA-2006B-1 *M-213-9* *E-9*	**Diesel Gen. "B" Startup Air Start Vlv (Set #1)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *AO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047B SP-42-312B
SA-2006B-2 *M-213-9* *E-9*	**Diesel Gen. "B" Startup Air Solenoid Vlv (Set #1)** *Diesel Generator Mechanical* *NCC B*	*GL* *0.375* *SO*	*C*	*O*	*C*	*A*	*N*	Skid		SP-42-047B SP-42-312B

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-2006B-3 *M-213-9* *E-10*	**Diesel Gen. "B" Startup Air Start Motor Check Vlv (Set #1)** *Diesel Generator Mechanical* *NCC C*	*CK* *0.375* *SA*	*C*	*C*	*N/A*	*N*	*P*	Skid		SP-42-047B SP-42-312B
SA-2050A1-P *M-213-9* *B-1*	**DG Start-up Air Receiver 1A1-P Relief Vlv** *Diesel Generator Mechanical* *NCC C*	*SRV* *0.5* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP-1-8
SA-2050A2-P *M-213-9* *B-2*	**DG Start-up Air Receiver 1A2-P Relief Vlv** *Diesel Generator Mechanical* *NCC C*	*SRV* *0.5* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP-1-8
SA-2050B1-P *M-213-9* *B-7*	**DG Start-up Air Receiver 1B1-P Relief Vlv** *Diesel Generator Mechanical* *NCC C*	*SRV* *0.5* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP-1-8
SA-2050B2-P *M-213-9* *B-8*	**DG Start-up Air Receiver 1B2-P Relief Vlv** *Diesel Generator Mechanical* *NCC C*	*SRV* *0.5* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP-1-8

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
LOCA-100A *M-403* *E-2*	**Post LOCA H2 to Recombiner A** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-100B *M-403* *E-2*	**Post LOCA H2 to Recombiner B** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-10A *M-403* *E-2*	**H2 SMPL to Gas Analyzer Isolation Valve A** *Reactor Bldg Ventilation* *NCC A*	*BL* *1* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-10B *M-403* *E-2*	**H2 SMPL to Gas Analyzer Isolation Valve B** *Reactor Bldg Ventilation* *NCC A*	*BL* *1* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-201A *M-403* *E-2*	**Post-LOCA H2 Recombiner A to CNTMT** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
LOCA-201B *M-403* *E-2*	**Post-LOCA H2 Recombiner B to CNTMT** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-2A *M-403* *E-2*	**Post-LOCA H2 CNTMT Vent A Isolation Valve** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *MO*	*C*	*OC*	*AI*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-274 SP-56A-090
LOCA-2B *M-403* *E-2*	**Post-LOCA H2 CNTMT Vent B Isolation Valve** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *MO*	*C*	*OC*	*AI*	*A*	*A*	AET(CS) AST-O(CS) AST-C(CS) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-274 SP-56A-090
LOCA-3A *M-403* *E-2*	**Post-LOCA H2 CNTMT Vent A Isolation Valve** *Reactor Bldg Ventilation* *NCC A*	*BL* *1* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090
LOCA-3B *M-403* *E-2*	**Post-LOCA H2 CNTMT Vent B Isolation Valve** *Reactor Bldg Ventilation* *NCC A*	*BL* *1* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-273 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RBV-1 *M-602* *F-5*	**Cntmt Purge/Vent Supply Valve A** *Reactor Bldg Ventilation* *NCC A*	*BTF* *36* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1	TJ-15 TJ-15 TJ-15	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273 SP-56A-090
RBV-150A *M-602* *B-8*	**F/C Unit Emergency Discharge Damper A** *Reactor Bldg Ventilation* *NCC N/A*	*DMP* *48* *AO*	*C*	*O*	*O*	*A*	*N*	AET(R) AST-O(R) AFST-O(R) APIT(R)		SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273
RBV-150B *M-602* *B-8*	**F/C Unit Emergency Discharge Damper B** *Reactor Bldg Ventilation* *NCC N/A*	*DMP* *48* *AO*	*C*	*O*	*O*	*A*	*N*	AET(R) AST-O(R) AFST-O(R) APIT(R)		SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273
RBV-150C *M-602* *A-11*	**F/C Unit Emergency Discharge Damper C** *Reactor Bldg Ventilation* *NCC N/A*	*DMP* *48* *AO*	*C*	*O*	*O*	*A*	*N*	AET(R) AST-O(R) AFST-O(R) APIT(R)		SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273
RBV-150D *M-602* *C-11*	**F/C Unit Emergency Discharge Damper D** *Reactor Bldg Ventilation* *NCC N/A*	*DMP* *48* *AO*	*C*	*O*	*O*	*A*	*N*	AET(R) AST-O(R) AFST-O(R) APIT(R)		SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RBV-2 *M-602* *F-6*	**Cntmt Purge/Vent Supply Valve B** *Reactor Bldg Ventilation* *NCC A*	*BTF* *36* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1	TJ-15 TJ-15 TJ-15	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273 SP-56A-090
RBV-3 *M-602* *E-6*	**Cntmt Purge/Vent Exhaust Valve B** *Reactor Bldg Ventilation* *NCC A*	*BTF* *36* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1	TJ-15 TJ-15 TJ-15	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273 SP-56A-090
RBV-4 *M-602* *E-5*	**Cntmt Purge/Vent Exhaust Valve A** *Reactor Bldg Ventilation* *NCC A*	*BTF* *36* *AO*	*C*	*C*	*C*	*N*	*A*	AET(CS) AST-C(CS) AFST-C(CS) APIT(2Y) ASLT-1	TJ-15 TJ-15 TJ-15	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273 SP-56A-090
SA-7000A *M-403* *F-1*	**Emergency Air Supply for Post-LOCA H2 Control Manual Valve** *Reactor Bldg Ventilation* *NCC B*	*GT* *1.25* *MA*	*C*	*O*	*N/A*	*A*	*N*	AFSM(2Y)	TJ-17	SP-55-167-12
SA-7000B *M-403* *F-12*	**Emergency Air Supply for Post-LOCA H2 Control Manual Valve** *Reactor Bldg Ventilation* *NCC B*	*GT* *1.25* *MA*	*C*	*O*	*N/A*	*A*	*N*	AFSM(2Y)	TJ-17	SP-55-167-12

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-7001A	**Emergency Air Supply for Post-LOCA H2 Control Manual Valve**							AFSM(2Y)	TJ-17	SP-55-167-12
M-403	*Reactor Bldg Ventilation*	*BL* *2* *MA*	*C*	*O*	*N/A*	*A*	*N*			
E-2	*NCC B*									
SA-7001B	**Emergency Air Supply for Post-LOCA H2 Control Manual Valve**							AFSM(2Y)	TJ-17	SP-55-167-12
M-403	*Reactor Bldg Ventilation*	*BL* *2* *MA*	*C*	*O*	*N/A*	*A*	*N*			
E-9	*NCC B*									
SA-7002A	**H2 Analyzer Check Valve**							ACV-O(R)	TJ-18	determine
M-403	*Reactor Bldg Ventilation*	*CK* *2* *SA*	*C*	*O*	*N/A*	*A*	*N*			
D-3	*NCC C*									
SA-7002B	**H2 Analyzer Check Valve**							ACV-O(R)	TJ-18	determine
M-403	*Reactor Bldg Ventilation*	*CK* *2* *SA*	*C*	*O*	*N/A*	*A*	*N*			
D-8	*NCC C*									
SA-7003A	**Hydrogen Dilution to Containment Control Valve - Pen 36SE**							AET(CS) AST-O(CS)		SP-55-167-4 SP-55-167-4
M-403	*Reactor Bldg Ventilation*	*BL* *2* *MO*	*C*	*OC*	*AI*	*A*	*A*	AST-C(CS) APIT(2Y)		SP-55-167-4 SP-87-274
D-4	*NCC A*							ASLT-1		SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SA-7003B *M-403* *D-7*	**Hydrogen Dilution to Containment Control Valve - Pen 36NW** *Reactor Bldg Ventilation* *NCC A*	*BL* *2* *MO*	*C*	*OC*	*AI*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) APIT(2Y) ASLT-1		SP-55-167-4 SP-55-167-4 SP-55-167-4 SP-87-274 SP-56A-090
SA-7004A *M-403* *D-5*	**Air Supply for Post-LOCA H2 Control - Pen 36SE** *Reactor Bldg Ventilation* *NCC AC*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*A*	ACV-O(R) ACV-C(R) ASLT-1	TJ-18	determine determine SP-56A-090
SA-7004B *M-403* *D-7*	**Air Supply for Post-LOCA H2 Control - Pen 36NW** *Reactor Bldg Ventilation* *NCC AC*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*A*	ACV-O(R) ACV-C(R) ASLT-1	TJ-18	determine determine SP-56A-090
VB-10A *M-602* *A-2*	**Power Operated Cntmt Vacuum Breaker A** *Reactor Bldg Ventilation* *NCC A*	*BF* *18* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-11 SP-55-167-11 SP-55-167-11 SP-55-167-11 SP-87-273 SP-56A-090
VB-10B *M-602* *A-2*	**Power Operated Cntmt Vacuum Breaker B** *Reactor Bldg Ventilation* *NCC A*	*BF* *18* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-O(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-11 SP-55-167-11 SP-55-167-11 SP-55-167-11 SP-87-273 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
VB-11A *M-602* *A-3*	**Cntmt Vacuum Breaker A Check Valve** *Reactor Bldg Ventilation* *NCC AC*	*CK* *21* *SA*	*C*	*OC*	*N/A*	*A*	*A*	ACV-O(Q) ACV-C(Q) APIT(2Y) ASLT-1		SP-55-167-11 SP-55-167-11 SP-55-167-11 SP-56A-090
VB-11B *M-602* *A-2*	**Cntmt Vacuum Breaker B Check Valve** *Reactor Bldg Ventilation* *NCC AC*	*CK* *21* *SA*	*C*	*OC*	*N/A*	*A*	*A*	ACV-O(Q) ACV-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
FPC-11A	**Cooling Water from Heat Exch. to Spent Fuel Pool A Check Valve**							CV-O(CU)	TP-01	NAO Log
M-218	*Spent Fuel Pool Cooling*	*CK* *6*	*O*	*O*	*N/A*	*A*	*N*			
A-11	*3 C*	*SA*								
FPC-11B	**Cooling Water from Heat Exch. to Spent Fuel Pool B Check Valve**							CV-O(CU)	TP-01	NAO Log
M-218	*Spent Fuel Pool Cooling*	*CK* *6*	*O*	*O*	*N/A*	*A*	*N*			
A-10	*3 C*	*SA*								

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CI-1001A M-217 C-10	Caustic Additive to Cntmt Spray Control Vlv Internal Containment Spray NCC B	GL 2 AO	C	O	O	A	N	AET(R) AST-O(R) AFST-O(R) APIT(2Y)	TJ-02 TJ-02 TJ-02	SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273
CI-1001B M-217 C-10	Caustic Additive to Cntmt Spray Control Valve Internal Containment Spray NCC B	GL 2 AO	C	O	O	A	N	AET(R) AST-O(R) AFST-O(R) APIT(2Y)	TJ-02 TJ-02 TJ-02	SP-55-167-9 SP-55-167-9 SP-55-167-9 SP-87-273
CI-1003 M-217 C-10	Caustic Line Check Valve Internal Containment Spray 2 C	CK 2 SA	C	OC	N/A	A	A	CV-O(R) CV-C(R)	ROJ-02 ROJ-02	PMP23-08 PMP23-08
ICS-201 M-217 B-7	ICS Recirculation to RWST (Series) Internal Containment Spray 2 B	GL 2 AO	O	C	C	N	A	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-23-100A/B SP-23-100A/B SP-23-100A/B SP-87-273
ICS-202 M-217 B-7	ICS Recirculation to RWST (Series) Internal Containment Spray 2 B	GL 2 AO	O	C	N/A	N	A	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y)		SP-23-100A/B SP-23-100A/B SP-23-100A/B SP-87-273

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	POSITIONS Safety	POSITIONS Failsafe	ACTIVE-PASSIVE Open A/P/N	ACTIVE-PASSIVE Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
ICS-20A *M-217* *F-9*	**Containment Spray Pump 1A Inlet Relief Vlv** *Internal Containment Spray* 2 C	*SRV* *1* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-01
ICS-20B *M-217* *E-9*	**Containment Spray Pump 1B Inlet Relief Vlv** *Internal Containment Spray* 2 C	*SRV* *1* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-01
ICS-2A *M-217* *F-9*	**Cntmt Spray Pump A Suct from RWST** *Internal Containment Spray* 2 B	*GT* *8* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-23-100A SP-23-100A SP-87-274
ICS-2B *M-217* *C-2*	**Cntmt Spray Pump B Suct from RWST** *Internal Containment Spray* 2 B	*GT* *8* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-23-100B SP-23-100B SP-87-274
ICS-3A *M-217* *G-2*	**Containment Spray Pump 1A Suction Check Valve** *Internal Containment Spray* 2 C	*CK* *8* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-23-100A

VALVE NO / *PID NO* / *COORD*	VALVE DESCRIPTION / *SYSTEM NAME* / *Code: Class Cat*	*VALVE* *Type* / *Size (In.)* / *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	*Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
ICS-3B *M-217* *E-9*	**Containment Spray Pump 1B Suction Check Valve** *Internal Containment Spray* *2 C*	*CK* *8* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-23-100B
ICS-4A *M-217* *F-7*	**Containment Spray Pump 1A Disch Check Valve** *Internal Containment Spray* *2 C*	*CK* *6* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-23-100A
ICS-4B *M-217* *E-7*	**Containment Spray Pump 1B Disch Check Valve** *Internal Containment Spray* *2 C*	*CK* *6* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-23-100B
ICS-5A *M-217* *F-7*	**Containment Spray Pump 1A Discharge Isolation Valve** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*O*	*AI*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-23-100A SP-23-100A SP-87-274
ICS-5B *M-217* *C-7*	**Containment Spray Pump 1B Discharge Isolation Valve** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*O*	*AI*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-23-100B SP-23-100B SP-87-274

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
ICS-6A *M-217* *F-7*	**Containment Spray Pump 1A Discharge Isolation Valve** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*O*	*AI*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-23-100A SP-23-100A SP-87-274
ICS-6B *M-217* *E-7*	**Containment Spray Pump 1B Discharge Isolation Valve** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*O*	*AI*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-23-100B SP-23-100B SP-87-274
ICS-8A *M-217* *B-3*	**Containment Spray Pump 1A to Containment Vessel Check Valve** *Internal Containment Spray* *2 AC*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q) SLT-1		SP-23-100A SP-23-100A SP-56A-090
ICS-8B *M-217* *B-4*	**Containment Spray Pump 1B to Containment Vessel Check Valve** *Internal Containment Spray* *2 AC*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q) SLT-1		SP-23-100B SP-23-100B SP-56A-090
ICS-9A *M-217* *B-3*	**Containment Spray Pump 1A to Containment Vessel Check Valve** *Internal Containment Spray* *2 AC*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q) SLT-1		SP-23-100A SP-23-100A SP-56A-090

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/RR	TEST PROC
ICS-9B *M-217* *A-3*	**Containment Spray Pump 1B to Containment Vessel Check Valve** *Internal Containment Spray* *2 AC*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(Q) SLT-1		SP-23-100B SP-23-100B SP-56A-090
RHR-400A *M-217* *E-8*	**RHR Pump A Supply to ICS Pump A Isol Vlv** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y)		SP-34-099A SP-34-099A SP-34-099A SP-87-274
RHR-400B *M-217* *E-8*	**RHR Pump B Supply to ICS Pump B Isol Vlv** *Internal Containment Spray* *2 B*	*GT* *6* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y)		SP-34-099B SP-34-099B SP-34-099B SP-87-274
RHR-401A *M-217* *F-9*	**Containment Spray Pump A Suction from RHR Pump A** *Internal Containment Spray* *2 C*	*CK* *6* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-34-099A
RHR-401B *M-217* *E-9*	**Containment Spray Pump B Suction from RHR Pump B** *Internal Containment Spray* *2 C*	*CK* *6* *SA*	*C*	*O*	*N/A*	*A*	*N*	CV-O(Q)		SP-34-099B

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
HS-2203A-1 M-588 G-2	Inlet Supply to Control Room Chiller Pump 1A Control Room Air Conditioning 3 B	GL 2.5 AO	O	C	C	N	A	ET(R) ST-C(R) FST-C(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327A SP-25-327A SP-25-327A SP-25-327A
HS-2203B-1 M-588 G-9	Inlet Supply to Control Room Chiller Pump 1B Control Room Air Conditioning 3 B	GL 2.5 AO	O	C	C	N	A	ET(R) ST-C(R) FST-C(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327B SP-25-327B SP-25-327B SP-25-327B
SW-1040A-1 M-588 D-3	SW Supply to Control Room Chiller 1A Control Room Air Conditioning 3 B	GL 2.5 AO	O	C	C	N	A	ET(R) ST-C(R) FST-C(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327A SP-25-327A SP-25-327A SP-25-327A
SW-1040A-2 M-588 H-4	SW Supply to Control Room A/C 1A Coil Control Room Air Conditioning 3 B	GL 2.5 AO	C	O	O	A	N	ET(R) ST-O(R) FST-O(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327A SP-25-327A SP-25-327A SP-25-327A
SW-1040B-1 M-588 D-8	SW Supply to Control Room Chiller 1A Control Room Air Conditioning 3 B	GL 2.5 AO	O	C	C	N	A	ET(R) ST-C(R) FST-C(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327B SP-25-327B SP-25-327B SP-25-327B

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SW-1040B-2 *M-588* *H-7*	**SW Supply to Control Room A/C 1B Coil** *Control Room Air Conditioning* *3 B*	*GL* *2.5* *AO*	*C*	*O*	*O*	*A*	*N*	ET(R) ST-O(R) FST-O(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327B SP-25-327B SP-25-327B SP-25-327B
SW-1042A-1 *M-588* *H-2*	**SW Return from Control Room A/C 1A Coil** *Control Room Air Conditioning* *3 B*	*GL* *2.5* *AO*	*C*	*O*	*O*	*A*	*N*	ET(R) ST-O(R) FST-O(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327A SP-25-327A SP-25-327A SP-25-327A
SW-1042B-1 *M-588* *H-9*	**SW Return from Control Room A/C 1B Coil** *Control Room Air Conditioning* *3 B*	*GL* *2.5* *AO*	*C*	*O*	*O*	*A*	*N*	ET(R) ST-O(R) FST-O(R) PIT(2Y)	ROJ-07 ROJ-07 ROJ-07 TP-03	SP-25-327B SP-25-327B SP-25-327B SP-25-327B

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MU-1010-1 *XK-100-10* *A-9*	**Reactor Makeup Water to Containment Isolation Valve (Otbd)** *Reactor Makeup* *NCC A*	*DI* *2* *AO*	*C*	*OC*	*C*	*A*	*A*	AET(Q) AST-C(Q) AST-O(Q) AFST-C(Q) APIT(2Y) ASLT-1	TP-02	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
MU-1011 *XK-100-10* *D-2*	**Reactor Makeup Water to Containment Isol Check (Inbd)** *Reactor Makeup* *NCC AC*	*CK* *2* *SA*	*C*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-10	SP-56A-090 SP-56A-090

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CI-122A M-214 F-4	**AFW Hydrazine Tk Disch to FW Line 1A Manual Valve** Chemical Injection 2 B	GL 0.75 MA	OC	C	N/A	N	A	FSM(2Y)	TP-06	SP-55-167-12
CI-122B M-214 F-4	**AFW Hydrazine Tk Disch to FW Line 1B Manual Valve** Chemical Injection 2 B	GL 0.75 MA	OC	C	N/A	N	A	FSM(2Y)	TP-06	SP-55-167-12
CI-128A M-214 G-4	**AFW Hydrazine Feed to AFW 1A to S/G Manual Valve** Chemical Injection 2 B	GL 0.75 MA	OC	C	N/A	N	A	FSM(2Y)	TP-06	SP-55-167-12
CI-128B M-214 G-5	**AFW Hydrazine Feed to AFW 1B to S/G Manual Valve** Chemical Injection 2 B	GL 0.75 MA	OC	C	N/A	N	A	FSM(2Y)	TP-06	SP-55-167-12
CI-232A M-214 F-8	**CD Hydrazine Tk Disch to FW Line 1A Manual Valve** Chemical Injection 2 B	GL 0.75 MA	OC	C	N/A	N	A	FSM(2Y)	TP-06	SP-55-167-12

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CI-232B	**CD Hydrazine Tk Disch to FW Line 1B Manual Valve**							FSM(2Y)	TP-06	SP-55-167-12
M-214	*Chemical Injection*	*GL* *0.75*	*OC*	*C*	*N/A*	*N*	*A*			
F-8	*2 B*	*MA*								

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/RR	TEST PROC
CVC-54 *M-539* *D-3*	**VCT Vent to Containment Solenoid Valve** *Misc. Drains and Sumps* *NCC A*	*SO* *2* *SO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
CVC-55 *M-539* *C-2*	**VCT Vent Line Inside Cntmt Check Valve** *Misc. Drains and Sumps* *NCC AC*	*CK* *2* *SA*	*C*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-04	SP-56A-090 SP-56A-090
MD(R)-323A *M-539* *F-3*	**DDT Containment Disch Isol A** *Misc. Drains and Sumps* *NCC A*	*GT* *3* *MO*	*C*	*C*	*AI*	*N*	*A*	AET(Q) AST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-87-274 SP-56A-090
MD(R)-323B *M-539* *F-3*	**DDT Containment Disch Isol B** *Misc. Drains and Sumps* *NCC A*	*GT* *3* *MO*	*C*	*C*	*AI*	*N*	*A*	AET(Q) AST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-87-274 SP-56A-090
MD(R)-324 *M-539* *F-3*	**DDT Disch Inside Cntmt Check Valve** *Misc. Drains and Sumps* *NCC AC*	*CK* *3* *SA*	*C*	*C*	*N/A*	*A*	*A*	ACV-PO(R) ACV-C(R) ASLT-1	TJ-08	SP-56A-090 SP-56A-090 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/RR	TEST PROC
WG-310 *M-539* *B-3*	**DDT Vent Outside Cntmt Solenoid Valve** *Misc. Drains and Sumps* *NCC A*	*SOL* *2* *SO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 Determine SP-56A-090
WG-311 *M-539* *B-3*	**DDT Vent Inside Cntmt Solenoid Valve** *Misc. Drains and Sumps* *NCC A*	*SOL* *1* *SO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-56A-090

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CC-3A XK-100-19 B-7	CCW Pump 1A Discharge Check Valve Component Cooling Water 3 C	CK 10 SA	O	OC	N/A	A	A	CV-PO(Q) CV-C(Q) CV-O(CS)	CSJ-20	SP-31-168A SP-31-168B SP-31-335
CC-3B XK-100-19 C-7	CCW Pump 1B Discharge Check Valve Component Cooling Water 3 C	CK 10 SA	O	OC	N/A	A	A	CV-PO(Q) CV-C(Q) CV-O(CS)	CSJ-20	SP-31-168B SP-31-168A SP-31-335
CC-400A XK-100-19 G-5	CCW Supply to RHR HX 1A Isolation Vlv Component Cooling Water 3 B	GT 10 MO	C	O	AI	A	N	ET(Q) ST-O(Q) PIT(2Y)		SP-31-168A SP-31-168A SP-87-274
CC-400B XK-100-19 H-3	CCW Supply to RHR HX 1B Isolation Vlv Component Cooling Water 3 B	GT 10 MO	C	O	AI	A	N	ET(Q) ST-O(Q) PIT(2Y)		SP-31-168B SP-31-168B SP-87-274
CC-401A XK-100-19 H-5	RHR HX 1A Shell Side Outlet Relief Valve Component Cooling Water 3 C	SRV 1 SA	C	O	N/A	A	N	RVT(10Y)	VRR-01	GMP-101-01

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	VALVE *Type* *Size (In.)* *Actuator*	POSITIONS *Normal*	 *Safety*	 *Failsafe*	ACTIVE-PASSIVE *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CC-401B *XK-100-19* *H-3*	**RHR HX 1B Shell Side Outlet Relief Valve** *Component Cooling Water* *3 C*	*SRV* *1* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(10Y)	VRR-01	GMP-101-01
CC-600 *XK-100-20* *C-9*	**Containment Equipment CCW Supply Header Isolation Valve** *Component Cooling Water* *3 B*	*GT* *8* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-01 CSJ-01	SP-55-167-6 SP-55-167-6 SP-87-274
CC-601A *XK-100-20* *E-7*	**RCP 1A CCW Supply Isolation Valve** *Component Cooling Water* *3 B*	*GT* *4* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-02 CSJ-02	SP-55-167-6 SP-55-167-6 SP-87-274
CC-601B *XK-100-20* *E-10*	**RCP 1B CCW Supply Isolation Valve** *Component Cooling Water* *3 B*	*GT* *4* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-02 CSJ-02	SP-55-167-6 SP-55-167-6 SP-87-274
CC-611A *XK-100-20* *G-8*	**RCP 1A Cooling Water Return Header Relief Valve** *Component Cooling Water* *3 C*	*SRV* *3* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-01

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CC-611B XK-100-20 F-11	**RCP 1B Cooling Water Return Header Relief Valve** *Component Cooling Water* 3 C	SRV 3 SA	C	OC	N/A	A	P	RVT(10Y)		GMP-101-01
CC-612A XK-100-20 E-8	**RCP 1A Cooling Water Return Isolation Valve** *Component Cooling Water* 3 B	GT 4 MO	O	C	AI	N	A	ET(CS) ST-C(CS) PIT(2Y)	CSJ-02 CSJ-02	SP-55-167-6 SP-55-167-6 SP-87-274
CC-612B XK-100-20 E-11	**RCP 1B Cooling Water Return Isolation Valve** *Component Cooling Water* 3 B	GT 4 MO	O	C	AI	N	A	ET(CS) ST-C(CS) PIT(2Y)	CSJ-02 CSJ-02	SP-55-167-6 SP-55-167-6 SP-87-274
CC-630A XK-100-20 H-8	**RCP 1A Thermal Barrier Cooling Water Return Thermal Relief Valve** *Component Cooling Water* 3 N/A	SRV 0.75 SA	C	OC	N/A	A	P	RVT(10Y)		GMP-101-01
CC-630B XK-100-20 H-11	**RCP 1B Thermal Barrier CC Rtn Thermal Relief Valve** *Component Cooling Water* 3 N/A	SRV 0.75 SA	C	OC	N/A	A	P	RVT(10Y)		GMP-101-01

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CC-652 *XK-100-20* *E-9*	**Excess Ltdn HX CC Water Return Thermal Relief Valve** *Component Cooling Water* *3 C*	*SRV* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-01
CC-653 *XK-100-20* *E-9*	**Excess Letdown HX CC Return** *Component Cooling Water* *3 B*	*GT* *3* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-31-168B SP-31-168B SP-87-274
CC-6A *XK-100-19* *B-9*	**CC Heat Exchanger B Outlet Isolation Valve** *Component Cooling Water* *3 B*	*GT* *12* *MO*	*O*	*O*	*AI*	*P*	*N*	PIT(2Y)		SP-87-274
CC-6B *XK-100-19* *C-9*	**CC Heat Exchanger B Outlet Isolation Valve** *Component Cooling Water* *3 B*	*GT* *12* *MO*	*O*	*O*	*AI*	*P*	*N*	PIT(2Y)		SP-87-274

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MD(R)-134 *XK-100-131* *G-3*	**Containment Sump to DH No.1** *Liquid Waste Processing* *NCC A*	*DI* *3* *AO*	*OC*	*OC*	*C*	*A*	*A*	AET(Q) AST-C(Q) AST-O(Q) AFST-C(Q) APIT(2Y) ASLT-1	TP-02	SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
MD(R)-135 *XK-100-131* *G-4*	**Containment Sump to DH No.1** *Liquid Waste Processing* *NCC A*	*DI* *3* *AO*	*OC*	*OC*	*C*	*A*	*A*	AET(Q) AST-C(Q) AST-O(Q) AFST-C(Q) APIT(2Y) ASLT-1	TP-02	SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
RC-507 *XK-100-131* *E-3*	**Reactor Coolant Drain Pumps Disch Hdr Isol Vlv** *Liquid Waste Processing* *NCC A*	*DI* *3* *AO*	*OC*	*OC*	*C*	*A*	*A*	AET(Q) AST-C(Q) AST-O(Q) AFST-C(Q) APIT(2Y) ASLT-1	TP-02	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
RC-508 *XK-100-131* *E-3*	**Reactor Coolant Drain Pumps Disch Hdr Isol Vlv** *Liquid Waste Processing* *NCC A*	*DI* *3* *AO*	*OC*	*OC*	*C*	*A*	*A*	AET(Q) AST-C(Q) AST-O(Q) AFST-C(Q) APIT(2Y) ASLT-1	TP-02	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MG(R)-503 XK-100-131 C-3	Reactor Coolant Drain Tank to GA Gaseous Waste Disposal NCC A	DI .375 AO	C	C	C	N	A	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
MG(R)-504 XK-100-131 C-3	Reactor Coolant Drain Tank to GA Gaseous Waste Disposal NCC A	DI .375 AO	C	C	C	N	A	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
MG(R)-509 XK-100-131 D-3	Reactor Coolant Drain Tank to VH-1 Gaseous Waste Disposal NCC A	DI 1 AO	O	C	C	N	A	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
MG(R)-510 XK-100-131 D-4	Reactor Coolant Drain Tank to VH-1 Gaseous Waste Disposal NCC A	DI 1 AO	O	C	C	N	A	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090
MG(R)-512 XK-100-10 A-9	Press Relief Tank to Auto. Gas Analyzer Gaseous Waste Disposal NCC A	DI .375 AO	C	C	C	N	A	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
MG(R)-513 *XK-100-10* *A-9*	Press Relief Tank to Auto. Gas Analyzer *Gaseous Waste Disposal* *NCC A*	*DI* *.375* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-3 SP-55-167-3 SP-55-167-3 SP-87-273 SP-56A-090

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
NG-107 *XK-100-28* *A-9*	**Nitrogen Supply to SI Accumulator Control Valve** *Safety Injection* *NCC A*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
NG-107-1 *XK-100-28* *A-8*	**Nitrogen Supply to SI Accumulators Cntmt Isol Check Valve** *Safety Injection* *NCC AC*	*CK* *1* *SA*	*C*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-11	SP-56A-090 SP-56A-090
NG-108A *XK-100-28* *A-4*	**Nitrogen Supply to Accumulator A Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273
NG-108B *XK-100-28* *D-4*	**Nitrogen Supply to Accumulator B Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273
SI-101A *XK-100-28* *B-4*	**SI Pump Makeup to Accumulator A Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-101B *XK-100-28* *E-4*	**SI Pump Makeup to Accumulator B Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273
SI-105A *XK-100-28* *B-3*	**Accumulator A Drain to RCDT Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273
SI-105B *XK-100-28* *E-3*	**Accumulator B Drain to RCDT Isol Vlv** *Safety Injection* *2 B*	*GL* *1* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273
SI-106A *XK-100-28* *A-4*	**SI Accumulator 1A Relief Vlv** *Safety Injection* *2 C*	*SRV* *1* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP33-08
SI-106B *XK-100-28* *D-4*	**SI Accumulator 1B Relief Vlv** *Safety Injection* *2 C*	*SRV* *1* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		PMP33-08

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-12A *XK-100-28* *C-2*	**SI Loop A Cold Leg Injection Line Check** *Safety Injection* *1 C*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*P*	CV-O(R)	ROJ-10	SP-33-191
SI-12B *XK-100-28* *F-2*	**SI Loop B Cold Leg Injection Line Check** *Safety Injection* *1 C*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R)	ROJ-10	SP-33-191
SI-13A *XK-100-28* *C-2*	**SI Loop A Cold Leg Injection Line Check** *Safety Injection* *1 C*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R) CV-C(R)	ROJ-11 ROJ-11	SP-33-191 SP-33-297
SI-13B *XK-100-28* *F-2*	**SI Loop B Cold Leg Injection Line Check** *Safety Injection* *1 C*	*CK* *6* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R) CV-C(R)	ROJ-11 ROJ-11	SP-33-191 SP-33-297
SI-15A *XK-100-28* *C-3*	**SI Reactor Vessel Isol Vlv** *Safety Injection* *2 B*	*GL* *2* *MO*	*C*	*C*	*AI*	*N*	*P*	PIT(2Y)		SP-87-274

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-15B	**SI Loop B to Reactor Vessel Isol Vlv**							PIT(2Y)		SP-87-274
XK-100-28	*Safety Injection*	*GL* *2*	*C*	*C*	*AI*	*N*	*P*			
F-3	*2 B*	*MO*								
SI-201A	**Accumulator A Chk Vlv Test Line Isol**							PIT(2Y)		SP-87-273
XK-100-28	*Safety Injection*	*GL* *0.75*	*C*	*C*	*C*	*N*	*P*			
D-6	*2 B*	*AO*								
SI-201B	**Accumulator B Chk Vlv Test Line Isol**							PIT(2Y)		SP-87-273
XK-100-28	*Safety Injection*	*GL* *0.75*	*C*	*C*	*C*	*N*	*P*			
E-5	*1 B*	*AO*								
SI-202A	**Accumulator A Chk Vlv Test Line Isol**							PIT(2Y)		SP-87-273
XK-100-28	*Safety Injection*	*GL* *0.75*	*C*	*C*	*C*	*N*	*P*			
D-6	*2 B*	*AO*								
SI-202B	**Accumulator B Chk Vlv Test Line Isol**							PIT(2Y)		SP-87-273
XK-100-28	*Safety Injection*	*GL* *0.75*	*C*	*C*	*C*	*N*	*P*			
E-5	*1 B*	*AO*								

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-206A *XK-100-29* *C-5*	SI Pump 1A Test Line Check *Safety Injection* *2 C*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(R)	ROJ-12	SP-33-098A SP-23-080
SI-206B *XK-100-29* *C-5*	SI Pump 1B Test Line Check *Safety Injection* *2 C*	*CK* *2* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(Q) CV-C(R)	ROJ-12	SP-33-098B SP-23-080
SI-208 *XK-100-29* *B-11*	SI Recirculation to RWST Isolation (Series) *Safety Injection* *2 B*	*GL* *2* *MO*	*O*	*OC*	*N/A*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099A/B SP-34-099A/B SP-87-274
SI-209 *XK-100-29* *B-11*	SI Recirculation to RWST Isolation (Series) *Safety Injection* *2 B*	*GL* *2* *MO*	*O*	*OC*	*N/A*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099A/B SP-34-099A/B SP-87-274
SI-21A *XK-100-28* *B-2*	Accumulator 1A to Loop A Cold Leg Check *Safety Injection* *1 C*	*CK* *10* *SA*	*C*	*OC*	*N/A*	*A*	*P*	CV-PO(CS) CV-O(R)	CSJ-18 VRR-04	SP-33-144 GMP-140

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-21B *XK-100-28* *F-2*	**Accumulator 1B to Loop B Cold Leg Check** *Safety Injection* *1 C*	*CK* *1* *SA*	*C*	*OC*	*N/A*	*A*	*P*	CV-PO(CS) CV-O(R)	CSJ-18 VRR-04	SP-33-144 GMP-140
SI-22A *XK-100-28* *B-2*	**Accumulator 1A to Loop A Cold Leg** *Safety Injection* *1 C*	*CK* *10* *SA*	*C*	*OC*	*N/A*	*A*	*P*	CV-PO(CS) CV-O(R)	CSJ-18 VRR-04	SP-33-144 GMP-140
SI-22B *XK-100-28* *F-2*	**Accumulator 1B to Loop B Cold Leg** *Safety Injection* *1 AC*	*CK* *12* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(CS) CV-C(CS) CV-O(R) SLT-2	CSJ-18 CSJ-18 VRR-04	SP-33-144 SP-34-204/204A GMP-140 SP-34-204/204A
SI-300A *XK-100-29* *E-10*	**RWST Supply to RHR Pump 1A Suction Isolation** *Safety Injection* *2 B*	*GT* *10* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099A SP-34-099A SP-87-274
SI-300B *XK-100-29* *E-10*	**RWST Supply to RHR Pump 1B Suction Isolation** *Safety Injection* *2 B*	*GT* *10* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099B SP-34-099B SP-87-274

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-301A XK-100-29 E-9	RWST to RHR Pump 1A Suction Check Safety Injection 2 C	CK 10 SA	C	O	N/A	A	N	CV-O(R)	ROJ-15	SP-55-167-9
SI-301B XK-100-29 E-9	RWST to RHR Pump 1B Suction Check Safety Injection 2 C	CK 10 SA	C	O	N/A	A	N	CV-O(R)	ROJ-15	SP-55-167-9
SI-302A XK-100-28 G-3	RHR Pump A Injection to RX Vessel Safety Injection 2 B	GT 6 MO	O	OC	AI	P	A	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099A SP-34-099A SP-87-274
SI-302B XK-100-28 G-3	RHR Pump B Injection to RX Vessel Safety Injection 2 B	GT 6 MO	O	OC	AI	P	A	ET(Q) ST-C(Q) PIT(2Y)		SP-34-099B SP-34-099B SP-87-274
SI-303A XK-100-28 G-3	RHR Loop A to Reactor Vessel Check Safety Injection 1 AC	CK 6 SA	C	OC	N/A	A	A	CV-O(CS) CV-C(CS) SLT-2	CSJ-19 CSJ-19	SP-34-285 SP-34-203 SP-34-203

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	POSITIONS Safety	POSITIONS Failsafe	ACTIVE-PASSIVE Open A/P/N	ACTIVE-PASSIVE Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-303B XK-100-28 G-3	RHR Loop B to Reactor Vessel Check Safety Injection 1 AC	CK 6 SA	C	OC	N/A	A	A	CV-O(CS) CV-C(CS) SLT-2	CSJ-19 CSJ-19	SP-34-285 SP-34-203 SP-34-203
SI-304A XK-100-28 G-2	RHR Loop A to Reactor Vessel Check Safety Injection 1 AC	CK 6 SA	C	OC	N/A	A	A	CV-O(CS) CV-C(CS) SLT-2	CSJ-19 CSJ-19	SP-34-285 SP-34-203 SP-34-203
SI-304B XK-100-28 G-2	RHR Loop B to Reactor Vessel Check Safety Injection 1 AC	CK 6 SA	C	OC	N/A	A	A	CV-O(CS) CV-C(CS) SLT-2	CSJ-19 CSJ-19	SP-34-285 SP-34-203 SP-34-203
SI-312 XK-100-28 G-7	RHR B to Reactor Vessel Relief Safety Injection 2 C	SRV 0.75 SA	C	OC	N/A	A	P	RVT(10Y)		PMP-33-07
SI-350A XK-100-28 H-8	Containment Sump B Supply to RHR Pump A Isolation Safety Injection 2 B	GT 12 MO	C	OC	AI	A	A	ET(Q) ST-O(Q) ST-C(Q) PIT(3Y) ASLT-3	VRR-05	SP-34-099A SP-34-099A SP-34-099A SP-87-274 NEP-14-18

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-350B *XK-100-28* *H-8*	**Containment Sump B Supply to RHR Pump B Isolation** *Safety Injection* *2 B*	*GT* *12* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(3Y) ASLT-3	 VRR-05 	SP-34-099B SP-34-099B SP-34-099B SP-87-274 NEP-14-18
SI-351A *XK-100-28* *H-9*	**Containment Sump B Supply to RHR Pump A Isolation** *Safety Injection* *2 B*	*GT* *12* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y) ASLT-3		SP-34-099A SP-34-099A SP-34-099A SP-87-274 NEP-14-18
SI-351B *XK-100-28* *H-9*	**Containment Sump B Supply to RHR Pump B Isolation** *Safety Injection* *2 B*	*GT* *12* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y) ASLT-3		SP-34-099B SP-34-099B SP-34-099B SP-87-274 NEP-14-18
SI-5A *XK-100-29* *B-7*	**SI Pump A Suction Isolation** *Safety Injection* *2 B*	*GT* *6* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-33-098A SP-33-098A SP-87-274
SI-5A-1 *XK-100-29* *A-6*	**SI Pump A Suction Relief Vlv** *Safety Injection* *2 C*	*SRV* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-1

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
SI-5B *XK-100-29* *C-7*	**SI Pump B Suction Isolation** *Safety Injection* *2 B*	*GT* *6* *MO*	*O*	*OC*	*AI*	*P*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-33-098B SP-33-098B SP-87-274
SI-5B-1 *XK-100-29* *B-6*	**SI Pump A Suction Relief Vlv** *Safety Injection* *2 C*	*SRV* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-1
SI-6A *XK-100-29* *B-4*	**Safety Injection Pump 1A Discharge Check** *Safety Injection* *2 C*	*CK* *4* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R) CV-C(R)	ROJ-13 ROJ-13	SP-33-191 SP-23-080
SI-6B *XK-100-29* *C-4*	**Safety Injection Pump 1B Discharge Check** *Safety Injection* *2 C*	*CK* *4* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-O(R) CV-C(R)	ROJ-13 ROJ-13	SP-33-191 SP-23-080
SI-9B *XK-100-28* *C-8*	**Safety Injection to Reactor Vessel Isolation** *Safety Injection* *2 B*	*GT* *3* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(Q) ST-C(Q) PIT(2Y)		SP-33-098A SP-33-098A SP-87-274

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RHR-100A *XK-100-18* *D-8*	**RHR Heat Exchanger 1A By-pass Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*C*	*OC*	*N/A*	*A*	*P*	AFSM(CS)		N-RHR-34
RHR-100B *XK-100-18* *D-9*	**RHR Heat Exchanger 1B By-pass Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*C*	*OC*	*N/A*	*A*	*P*	AFSM(CS)		N-RHR-34
RHR-10A *XK-100-18* *C-4*	**RHR Heat Exchanger 1A Outlet Cross-tie Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*C*	*OC*	*N/A*	*A*	*P*	AFSM(CS)		N-RHR-34
RHR-10B *XK-100-18* *C-4*	**RHR Heat Exchanger 1B Outlet Cross-tie Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*C*	*OC*	*N/A*	*A*	*P*	AFSM(CS)		N-RHR-34
RHR-11 *XK-100-18* *F-1*	**RHR Discharge to RCS Loop B Cold Leg Isol Vlv** *Residual Heat Removal* *1 B*	*GT* *10* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(CS) AST-O(CS) ST-C(CS) PIT(2Y)	CSJ-15 CSJ-15 CSJ-15	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-274

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RHR-1A *XK-100-18* *H-1*	**RCS Loop A Hot Leg Supply to RHR Pumps Isol Vlv** *Residual Heat Removal* *1 B*	*GT* *8* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(CS) ST-O(CS) ST-C(CS) PIT(2Y) ASLT-3	CSJ-16 CSJ-16 CSJ-16	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-274 SP-34-298
RHR-1B *XK-100-18* *H-1*	**RCS Loop B Hot Leg Supply to RHR Pumps Isol Vlv** *Residual Heat Removal* *1 B*	*GT* *8* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(CS) ST-O(CS) ST-C(CS) PIT(2Y) ASLT-3	CSJ-16 CSJ-16 CSJ-16	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-274 SP-34-298
RHR-299A *XK-100-29* *E-6*	**RHR Pump A Supply to SI Pump A Isol Valve** *Residual Heat Removal* *2 B*	*GT* *6* *MO*	*C*	*OC*	*N/A*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-33-098A SP-33-098A SP-87-274
RHR-299B *XK-100-29* *D-7*	**RHR Pump B Supply to SI Pump B Isol Valve** *Residual Heat Removal* *2 B*	*GT* *6* *MO*	*C*	*OC*	*N/A*	*A*	*P*	ET(Q) ST-O(Q) PIT(2Y)		SP-33-098B SP-33-098B SP-87-274
RHR-2A *XK-100-18* *H-1*	**RCS Loop A Hot Leg Supply to RHR Pumps Isol Vlv** *Residual Heat Removal* *1 B*	*GT* *8* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(CS) ST-O(CS) ST-C(CS) PIT(2Y)	CSJ-16 CSJ-16 CSJ-16	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-274

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RHR-2B *XK-100-18* *H-2*	**RCS Loop B Hot Leg Supply to RHR Pumps Isol Vlv** *Residual Heat Removal* *1 B*	*GT* *8* *MO*	*C*	*OC*	*AI*	*A*	*A*	ET(CS) ST-O(CS) ST-C(CS) PIT(2Y)	CSJ-16 CSJ-16 CSJ-16	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-274
RHR-30B-3 *XK-100-18* *H-1*	**RHR from Loop B Hot Leg Rupture Disk** *Residual Heat Removal* *1 D*	*RD* *0.50* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(5Y)		PM34-541
RHR-32A-3 *XK-100-18* *H-1*	**RHR from Loop A Hot Leg Rupture Disk** *Residual Heat Removal* *1 D*	*RD* *0.75* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(5Y)		PM34-540
RHR-33-1 *XK-100-18* *H-3*	**Hot leg to RHR Suction Header Relief to Sump B** *Residual Heat Removal* *2 C*	*SRV* *4* *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP101-1
RHR-3A *XK-100-18* *C-7*	**RHR Pump 1A Suction from Hot Leg Check** *Residual Heat Removal* *2 C*	*CK* *8* *SA*	*C*	*O*	*N/A*	*A*	*N*	ACV-O(CS)	TJ-16	SP-34-285

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RHR-3B *XK-100-18* *B-7*	**RHR Pump 1B Suction from Hot Leg Check** *Residual Heat Removal* *2 C*	*CK* *8* *SA*	*C*	*O*	*N/A*	*A*	*N*	ACV-O(CS)	TJ-16	SP-34-285
RHR-44 *XK-100-18* *F-2*	**RHR Return To Letdown Check Valve** *Residual Heat Removal* *2 C*	*CK* *0.75* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(CU) CV-C(CU)		N-RHR-34 DLY Log 22
RHR-4A *XK-100-18* *F-4*	**RHR Pump 1A Suction-Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*O*	*OC*	*N/A*	*P*	*A*	FSM(2Y)	TP-06	SP 55-167-12
RHR-4B *XK-100-18* *G-4*	**RHR Pump 1B Suction-Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GT* *8* *MA*	*O*	*OC*	*N/A*	*P*	*A*	FSM(2Y)	TP-06	SP 55-167-12
RHR-500A *XK-100-18* *F-3*	**RHR Pump 1A Minimum Flow Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GL* *2* *MA*	*O*	*OC*	*N/A*	*P*	*A*	FSM(2Y)	TP-06	SP 55-167-12

VALVE NO *PID NO* *COORD*	**VALVE DESCRIPTION** *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RHR-500B *XK-100-18* *C-3*	**RHR Pump 1B Minimum Flow Manual Isol Vlv** *Residual Heat Removal* *2 B*	*GL* *2* *MA*	*O*	*OC*	*N/A*	*P*	*A*	FSM(2Y)	TP-06	SP 55-167-12
RHR-5A *XK-100-18* *F-7*	**RHR Pump 1A Discharge Check** *Residual Heat Removal* *2 C*	*CK* *8* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(Q) CV-O(CS) ACV-C(CS)	 CSJ-17 CSJ-17	SP-34-099A SP-34-285 SP-34-285
RHR-5B *XK-100-18* *G-7*	**RHR Pump 1B Discharge Check** *Residual Heat Removal* *2 C*	*CK* *8* *SA*	*C*	*OC*	*N/A*	*A*	*A*	CV-PO(Q) CV-O(CS) ACV-C(CS)	 CSJ-17 TJ-17	SP-34-099B SP-34-285 SP-34-285
RHR-8A *XK-100-18* *C-5*	**RHR HX A Flow Control Valve** *Residual Heat Removal* *2 B*	*BTF* *8* *AO*	*O*	*O*	*O*	*A*	*N*	ET(Q)	VRR-02	SP-34-099A
RHR-8B *XK-100-18* *C-5*	**RHR HX B Flow Control Valve** *Residual Heat Removal* *2 B*	*BTF* *8* *AO*	*O*	*O*	*O*	*A*	*N*	ET(Q)	VRR-02	SP-34-099B

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/RR	TEST PROC
RHR-9A	**RHR Heat Exchanger 1A Outlet Manual Isol Vlv**							FSM(2Y)	TP-06	SP 55-167-12
XK-100-18	*Residual Heat Removal*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
C-4	*2 B*	*MA*								
RHR-9B	**RHR Heat Exchanger 1B Outlet Manual Isol Vlv**							FSM(2Y)	TP-06	SP 55-167-12
XK-100-18	*Residual Heat Removal*	*GT* *8*	*O*	*OC*	*N/A*	*P*	*A*			
C-4	*2 B*	*MA*								

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CVC-10 *XK-100-35* *B-9*	**Charging Header Check Valve** *Chemical and Volume Control* *2 AC*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-PO(CU) CV-C(R) SLT-1	 ROJ-03 	DLY Log 007 SP-56A-090 SP-56A-090
CVC-11 *XK-100-35* *A-2*	**Charging Line Isolation Valve** *Chemical and Volume Control* *1 B*	*GL* *2* *AO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) FST-C(CS) PIT(2Y)	CSJ-03 CSJ-03 CSJ-03 	SP-55-167-6 SP55-167-6 SP55-167-6 SP-87-273
CVC-12 *XK-100-35* *A-2*	**Charging Header Check** *Chemical and Volume Control* *1 C*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-C(R) CV-PO(CU)	ROJ-04 	RT DLY Log 007
CVC-14 *XK-100-35* *A-2*	**Charging Header Check Valve - CV Bypass** *Chemical and Volume Control* *2 C*	*CK* *2* *SA*	*O*	*C*	*N/A*	*N*	*A*	CV-PO(R)	CSJ-21	SP-55-167-6
CVC-15 *XK-100-35* *B-2*	**Auxiliary Pressurizer Spray Line Isolation Valve** *Chemical and Volume Control* *1 B*	*GL* *2* *AO*	*C*	*C*	*C*	*N*	*P*	PIT(2Y)		SP-87-273

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	*Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CVC-204A *XK-100-35* *G-7*	**RCP 1A Seal Water Injection Valve - Pen 13N** *Chemical and Volume Control* *2 B*	*NDL* *2* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(R)	TP-06	SP-55-167-12
CVC-204B *XK-100-35* *G-4*	**RCP 1B Seal Water Injection Valve - Pen 13E** *Chemical and Volume Control* *2 B*	*NDL* *2* *MA*	*O*	*C*	*N/A*	*N*	*A*	FSM(R)	TP-06	SP-55-167-12
CVC-205A *XK-100-35* *G-7*	**RCP 1A Seal Water Injection Check Valve** *Chemical and Volume Control* *1 AC*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-C(R) CV-PO(CU) SLT-1	ROJ-06	SP-056A-090 DLY Log 007 SP-056A-090
CVC-205B *XK-100-35* *G-4*	**RCP 1B Seal Water Injection Check Valve** *Chemical and Volume Control* *1 AC*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-C(R) CV-PO(CU) SLT-1	ROJ-06	SP-056A-090 DLY Log 007 SP-056A-090
CVC-206A *XK-100-35* *F-7*	**RCP 1A Seal Water Injection Check Valve** *Chemical and Volume Control* *1 AC*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-C(R) CV-PO(CU) SLT-1	ROJ-06	SP-056A-090 DLY Log 007 SP-056A-090

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	 Safety	 Failsafe	ACTIVE-PASSIVE Open A/P/N	 Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CVC-206B *XK-100-35* *F-4*	**RCP 1B Seal Water Injection Check Valve** *Chemical and Volume Control* *1 AC*	*CK* *2* *SA*	*O*	*OC*	*N/A*	*A*	*A*	CV-C(R) CV-PO(CU) SLT-1	ROJ-06	SP-056A-090 DLY Log 007 SP-056A-090
CVC-211 *XK-100-35* *C-9*	**RCP Seal Water Return Isolation Valve (Inbd)** *Chemical and Volume Control* *2 A*	*GL* *3* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y) SLT-1	CSJ-04 CSJ-04	SP-55-167-6 SP-55-167-6 SP-87-274 SP-056A-090
CVC-211-2 *XK-100-35* *C-9*	**CVC-211 Bypass Thermal Relief Check** *Chemical and Volume Control* *NCC AC*	*CK* *0.375* *SA*	*C*	*OC*	*N/A*	*A*	*A*	ACV-PO(R) ACV-C(R) ASLT-1	TJ-03 TJ-03	SP-056A-090 SP-056A-090 SP-056A-090
CVC-212 *XK-100-35* *C-9*	**RCP Seal Water Return Isolation Valve** *Chemical and Volume Control* *2 A*	*GT* *3* *MO*	*O*	*C*	*AI*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y) SLT-1	CSJ-04 CSJ-04	SP-55-167-6 SP-55-167-6 SP-87-274 SP-056A-090
CVC-261 *XK-100-35* *C-9*	**Excess Letdown and Seal Water Return Line Relief Valve** *Chemical and Volume Control* *2 C*	*SRV* *2* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(10Y)		GMP-101-01

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
CVC-301 *XK-100-36* *F-6*	**RWST Emerg Supply To Charging Pump Suction Isolation Valve** *Chemical and Volume Control* 2 B	GT 4 MO	C	C	AI	N	A	ET(CS) ST-C(CS) PIT(2Y)	CSJ-05 CSJ-05	SP-55-167-6 SP-55-167-6 SP-87-274
CVC-7 *XK-100-36* *F-2*	**Charging Line to Regen Hx Flow Control Valve** *Chemical and Volume Control* 2 A	GL 2 AO	O	C	O	N	A	ET(CS) SLT-1	VRR-02 CSJ-06	SP-55-167-6 SP-56A-090
CVC-9 *XK-100-36* *F-2*	**CV-142 Charging Line Flow Control Bypass Valve** *Chemical and Volume Control* 2 A	GL 2 MA	C	C	N/A	N	P	SLT-1		SP-56A-090
LD-2 *XK-100-10* *H-3*	**Cold Leg Loop B to CVCS Letdown Line Control Vlv** *Chemical and Volume Control* 1 B	GL 2 AO	O	C	C	N	A	ET(CS) ST-C(CS) FST-C(CS) PIT-(2Y)	CSJ-07 CSJ-07 CSJ-07	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273
LD-3 *XK-100-10* *H-3*	**Cold Leg Loop B to CVCS Letdown Line Control Vlv** *Chemical and Volume Control* 1 B	GL 2 AO	O	C	C	N	A	ET(CS) ST-C(CS) FST-C(CS) PIT(2Y)	CSJ-07 CSJ-07 CSJ-07	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273

VALVE NO / PID NO / COORD	VALVE DESCRIPTION / SYSTEM NAME / Code: Class Cat	VALVE Type / Size (In.) / Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
LD-4A *XK-100-35* *A-3*	**Letdown Orifice A Isolation Valve** *Chemical and Volume Control* 2 A	*GL* 2 *AO*	*OC*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
LD-4B *XK-100-35* *A-3*	**Letdown Orifice B Isolation Valve** *Chemical and Volume Control* 2 A	*GL* 2 *AO*	*OC*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
LD-4C *XK-100-35* *A-3*	**Letdown Orifice C Isolation Valve** *Chemical and Volume Control* 2 A	*GL* 2 *AO*	*OC*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
LD-5 *XK-100-35* *A-4*	**Regen HX to PRT Relief Valve** *Chemical and Volume Control* 2 C	*SRV* 2 *SA*	*C*	*OC*	*N/A*	*A*	*P*	RVT(10Y)		GMP-101-01
LD-6 *XK-100-35* *A-10*	**Letdown Line Isolation at Pen No. 11** *Chemical and Volume Control* 2 A	*GL* 2 *AO*	*O*	*C*	*C*	*N*	*A*	ET(CS) ST-C(CS) FST-C(CS) PIT(2Y) SLT-1	CSJ-08 CSJ-08 CSJ-08	SP-55-167-6 SP-55-167-6 SP-55-167-6 SP-87-273 SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	 *Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
LD-60 *XK-100-35* *A-5*	RHR to CVCS Letdown Line Isolation *Chemical and Volume Control* *2 B*	*GL* *2* *MO*	*OC*	*C*	*C*	*N*	*A*	ET(CS) ST-C(CS) PIT(2Y)	CSJ-09 CSJ-09	SP-55-167-6 SP-55-167-6 SP-87-274

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	*Safety*	*Failsafe*	*ACTIVE-PASSIVE* *Open* *A/P/N*	*Closed* *A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
NG-302 *XK-100-10* *A-9*	**Nitrogen Supply to PRT Control Vlv** *Reactor Coolant* *NCC A*	*DI* *0.75* *AO*	*OC*	*C*	*C*	*N*	*A*	AET-(Q) AST-C(Q) AFST-C(Q) APIT-(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
NG-304 *XK-100-10* *E-2*	**Nitrogen Supply Manifold to PRT Check Vlv** *Reactor Coolant* *NCC AC*	*CK* *0.75* *SA*	*OC*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-11	SP-56A-090 SP-56A-090
PR-1A *XK-100-10* *C-1*	**Pressurizer PORV Block Valve** *Reactor Coolant* *1 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y)	CSJ-13 CSJ-13 CSJ-13	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-36-302A
PR-1B *XK-100-10* *C-1*	**Pressurizer PORV Block Valve** *Reactor Coolant* *1 B*	*GT* *3* *MO*	*O*	*OC*	*AI*	*A*	*A*	ET(Q) ST-O(Q) ST-C(Q) PIT(2Y)	CSJ-13 CSJ-13 CSJ-13	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-36-302B
PR-2A *XK-100-10* *C-1*	**Pressurizer Power-Operated Relief Valve (PORV)** *Reactor Coolant* *1 B*	*GL* *3* *AO*	*C*	*OC*	*C*	*A*	*A*	ET(CS) ST-O(CS) ST-C(CS) FST-C(CS) PIT(2Y)	CSJ-14 CSJ-14 CSJ-14 CSJ-14	SP-55-167-8 SP-55-167-8 SP-55-167-8 SP-55-167-8 SP-55-167-6

VALVE NO PID NO COORD	VALVE DESCRIPTION SYSTEM NAME Code: Class Cat	VALVE Type Size (In.) Actuator	POSITIONS Normal	Safety	Failsafe	ACTIVE-PASSIVE Open A/P/N	Closed A/P/N	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
PR-2B XK-100-10 C-1	Pressurizer Power-Operated Relief Valve (PORV) Reactor Coolant 1 B	GL 3 AO	C	OC	C	A	A	ET(CS) ST-O(CS) ST-C(CS) FST-C(CS) PIT(2Y)	CSJ-14 CSJ-14 CSJ-14 CSJ-14	SP-55-167-8 SP-55-167-8 SP-55-167-8 SP-55-167-8 SP-55-167-6
PR-33A XK-100-10 A-1	Pressurizer Steam Space Vent Parallel Isol Vlv Train A Reactor Coolant 1 B	GL 1 SO	C	O	C	A	N	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082
PR-33B XK-100-10 A-1	Pressurizer Steam Space Vent Parallel Isol Vlv Train B Reactor Coolant 1 B	GL 1 SO	C	O	C	A	N	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082
PR-3A XK-100-10 C-2	Pressurizer Safety Valve Reactor Coolant 1 C	SRV 4 SA	C	OC	N/A	A	P	RVT(5Y)		Vendor
PR-3B XK-100-10 C-3	Pressurizer Safety Valve Reactor Coolant 1 C	SRV 4 SA	C	OC	N/A	A	P	RVT(5Y)		Vendor

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RC-45A *XK-100-10* *B-1*	**RX Head Vent Parallel Isol Vlv Train A** *Reactor Coolant* *1 B*	*GL* *1* *SO*	*C*	*O*	*C*	*A*	*N*	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082
RC-45B *XK-100-10* *B-1*	**RX Head Vent Parallel Isol Vlv Train B** *Reactor Coolant* *1 B*	*GL* *1* *SO*	*C*	*O*	*C*	*A*	*N*	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082
RC-46 *XK-100-10* *A-1*	**RX Head/Przr Vent to PRT Isol Vlv** *Reactor Coolant* *1 B*	*GL* *1* *SO*	*C*	*O*	*C*	*A*	*N*	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082
RC-49 *XK-100-10* *A-1*	**RX Head/Przr Vent to Cntmt Isol Vlv** *Reactor Coolant* *1 B*	*GL* *1* *SO*	*C*	*O*	*C*	*A*	*P*	ET(R) ST-O(R) PIT(2Y)	ROJ-09 ROJ-09	SP-55-167-9 SP-55-167-9 SP-36-139 SP-36-082

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RC-402 *XK-100-44* *A-2*	**Pressurizer Steam Space Sample Line Containment Isolation Valve** *Primary Sample System* *1 A*	*GL* *0.375* *AO*	*C*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
RC-403 *XK-100-44* *A-2*	**Pressurizer Steam Space Sample Line Containment Isolation Valves** *Primary Sample System* *1 A*	*GL* *0.375* *AO*	*C*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
RC-412 *XK-100-44* *B-2*	**Pressurizer Liquid Space Sample Line Containment Isolation Valve** *Primary Sample System* *1 A*	*GL* *0.375* *AO*	*C*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
RC-413 *XK-100-44* *B-3*	**Pressurizer Liquid Sample Line Containment Isolation Valve** *Primary Sample System* *1 A*	*GL* *0.375* *AO*	*C*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
RC-422 *XK-100-44* *C-2*	**RCS Hot Leg Sample Line Containment Isolation Valve** *Primary Sample System* *1 A*	*GL* *0.375* *SO*	*C*	*OC*	*C*	*A*	*A*	ET(Q) ST-C(Q) ST-O(Q) FST-C(Q) PIT(2Y) SLT-1	TP-02	SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-55-167-5 norm ops SP-56A-090

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
RC-423 *XK-100-44* *C-3*	**RCS Hot Leg Sample Line Containment Isolation Valve** *Primary Sample System* *1 A*	*GL* *0.375* *SO*	*C*	*C*	*C*	*N*	*A*	ET(Q) ST-C(Q) FST-C(Q) PIT(2Y) SLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 OP Log SP-56A-090
RC-440-3 *XK-100-44* *A-2*	**PZR Steam Space Sample Line Penetration 15 Rupture Disk** *Primary Sample System* *1 D*	*RD* *0.375* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(5Y)		PM37-529
RC-441-3 *XK-100-44* *B-2*	**PZR Liquid Sample Line Penetration 15 Rupture Disk** *Primary Sample System* *1 D*	*RD* *0.375* *SA*	*C*	*O*	*N/A*	*A*	*N*	RVT(5Y)		PM37-530

VALVE NO *PID NO* *COORD*	VALVE DESCRIPTION *SYSTEM NAME* *Code: Class Cat*	*VALVE* *Type* *Size (In.)* *Actuator*	*POSITIONS* *Normal*	 *Safety*	 *Failsafe*	*ACTIVE-PASSIVE* *Open A/P/N*	 *Closed A/P/N*	REQ TEST/FREQ	TP/TJ/CSJ/ ROJ/ RR	TEST PROC
AS-1 *M-602* *B-1*	**R-11/12 CNMNT Particulate/Gaseous Air Sample Supply Isol Vlv** *Radiation Monitoring* *NCC A*	*BL* *1* *AO*	*O*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
AS-2 *M-602* *B-1*	**R-11/12 CNMNT Particulate/Gaseous Air Sample Supply Isol Vlv** *Radiation Monitoring* *NCC A*	*BL* *1* *AO*	*O*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
AS-32 *M-602* *B-1*	**R-11/12 CNMNT Particulate/Gaseous Air Sample Return Isol Vlv** *Radiation Monitoring* *NCC A*	*BL* *1* *AO*	*O*	*C*	*C*	*N*	*A*	AET(Q) AST-C(Q) AFST-C(Q) APIT(2Y) ASLT-1		SP-55-167-5 SP-55-167-5 SP-55-167-5 SP-87-273 SP-56A-090
AS-33 *M-602* *B-1*	**R-11/12 CNMNT Particulate/Gaseous Air Sample Return Check Vlv** *Radiation Monitoring* *NCC A/C*	*CK* *1* *SA*	*O*	*C*	*N/A*	*N*	*A*	ACV-C(R) ASLT-1	TJ-01	SP-56A-090 SP-56A-090

APPENDIX A

PUMP RELIEF REQUESTS

PUMP RELIEF REQUEST - PRR-01

System: Component Cooling Water
Service Water

Components: CCW Pumps 1A, 1B
SW Pumps 1A1, 1A2, 1B1, 1B2

Code Class: 3

Function: The component cooling water and service water pumps perform the safety-related function of providing heat removal from essential safety-related equipment during accident conditions.

Code Requirement: Paragraph 5.2 of OM-6 details the pump parameters that must be measured or observed at least once every 3 months. It includes a requirement that either flow rate or differential pressure be held constant while measuring the other required parameters.

Alternate Testing: Service water pump performance measurements are made with the flow condition of nominal flow during power operations. Component cooling water pump performance measurements are made with the flow condition of nominal flow during power operation plus flow through RHR heat exchanger 1B. Flow measurements are made from a computer point and differential pressures are calculated and recorded. The differential pressure is compared to that predicted by the pump curve for the measured flow rate. Action levels have been established based on the deviation from the predicted pump curve values. This method of establishing Action levels is consistent with paragraph 6.1 of OM-6.

The following elements are used in developing and implementing the reference pump curves and is consistent with NRC guidance provided in Section 5.2 of NUREG-1482:

1. The data used to develop the pump acceptance criteria curves have been compared to the manufacturer supplied pump curves and the comparison does validate the proper operation of the pumps.

2. The instruments used to measure the operating characteristics of the pumps meet the 2% accuracy requirements stated in Table 1 of OM-6.

3. The pump curves are based on six data points.

4. The six data points chosen are beyond the "flat" portion of the curve in the region in which the pump is normally operating. The range of data points is within or as near as practicable to design basis flow rates.

5. KNPP Technical Specifications and the Updated Safety Analysis Report were reviewed to ensure that the pump curves do not conflict with any operability criteria.

6. The vibration levels do not vary significantly over the operating range of the pump therefore, one set of vibration acceptance criteria will be used.

7. An inservice test is performed on all equipment within the scope of the IST plan following repair, replacement, or performance altering maintenance to determine new acceptance criteria or revalidate the old acceptance criteria prior to returning the equipment to service.

Basis For Relief: Pursuant to 10 CFR 50.55a(f)(6)(i), relief is being requested on the basis that conformance to Code requirements is impractical for the facility.

The component cooling water pumps operate during a variety of flow rates, differential pressure conditions, and system demands resulting in the inability to easily establish a stable flow rate or differential pressure for evaluation against reference values. Varying the flow rate of the component cooling water pumps is impractical during normal plant operation due to the potential of creating transients in the reactor coolant pumps, which could cause a plant trip. The Code required test method would be an undue burden in that damage to plant equipment could occur as well as a plant transient/trip. The alternative testing can provide an adequate level of assurance of operational readiness of the component cooling water pumps without creating adverse conditions.

The service water pumps operate during a variety of flow rates, differential pressure conditions and system demands resulting in the inability to easily establish a stable flow rate or differential pressure for evaluation against reference values. Varying the flow rate of the service water pumps is impractical during normal plant operation due to the potential loss of adequate flow to various components dependent upon service water for cooling water flow and heat removal. The potential interruption of cooling water flow to these components is burdensom and could result in a reactor transient or a trip.

Note: This relief request combines previously approved relief requests IST-RR-11 and IST-RR-27. IST-RR-11 was previously approved for the Third 10-Year Interval via NRC Safety Evaluation Report dated July 15, 1994 with acceptance of anomaly resolution via NRC Safety Evaluation Report dated April 16, 1996. IST-RR-27 was previously approved for the Third 10-Year Interval via NRC Safety Evaluation Report dated April 16, 1996.

PUMP RELIEF REQUEST - PRR-02

System(s): Residual Heat Removal
Auxiliary Feedwater

Components: RHR Pumps 1A, 1B
AFW Pumps 1A, 1B, 1C

Code Class: 2 (RHR)
3 (AFW)

Function: The RHR pumps perform the safety-related function of providing low head safety injection and recirculation flow to the RCS for emergency core cooling to minimize fuel damage and the release of fission products and to provide long term shutdown cooling during post-accident conditions.

The AFW pumps are required to be capable of individually supplying 100% of the AFW flow to the steam generator(s) during a loss of normal feedwater flow and during a main steam line break (MSLB) in conjunction with a single failure resulting in single pump operation.

Code Requirement: Paragraph 4.6.1.2 of OM-6 requires that the full-scale range of each analog instrument shall not be greater than three times the reference value.

Alternate Testing: As an alternative to the instrument range requirements of paragraph 4.6.1.2 of OM-6, Residual Heat Removal and Auxiliary Feedwater pump suction pressures will be measured with the currently installed instrumentation with the accuracies stated in the following. The use of the existing gauges is supported by NUREG-1482, Paragraph 5.5.1 when the combination of range and accuracy yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements. No alternate testing will be performed. Any change in the baseline reference value shall be determined acceptable providing the indicated accuracy of the new reference value does not exceed the range or indicated accuracy allowables of OM-6.

Basis For Relief: Pursuant to 10 CFR 50.55a(a)(3)(i), relief is being requested on the basis that proposed alternative testing provides an acceptable level of quality and safety.

The local suction pressure gauges for the Residual Heat Removal pumps have a range of 0-100 psig and an accuracy of ±0.5%. The local suction presure gauges for the Auxiliary Feedwater pumps have a range of –15 to 100 psig and an accuracy of ±0.87%. KNPP does not maintain a suction pressure reference value for these pumps. Rather, a pump differential pressure is determined by subtracting the suction pressure from the discharge pressure.

The normal value for suction pressure of the Residual Heat Removal pumps is 28 psig. The suction pressure gauges exceed the three times the reference value criteria of OM-6. As previously stated, the accuracy of these gauges is ±0.5%, or 0.5 psig over the full scale reading. Using this accuracy with the three times reference valueof 84 psig yeilds an accuracy of ±0.6%. Combining this accuracy with the accuracy of the discharge pressure gauges results in a total pump differential pressure error of 0.92%, which is better than the ±2% accuracy required by OM-6.

The normal value for suction pressure of the Auxiliary Feedwater pumps is 15 psig. The suction pressure gauges exceed the three times the reference value criteria of OM-6. For ease of calculations, the range of the gauge is assumed to read 0 to 115 psig and the normal suction pressure reading would be 30 psig. As previously stated, the accuracy of these gauges is ±0.87%, or 1.0005 psig over the full scale reading. Using this accuracy with the three times reference value of 90 psig yields an accuracy of ±1.11%. Combining this accuracy with the accuracy of the discharge pressure gauges results in a total pump differential pressure error of 1.22%, which is better than the accuracy required by OM-6.

The existing permanently installed pump instrumentation is acceptable provided the indicated accuracy is less than or equal to that required by OM-6. No alternate testing will be performed. Any change in the baseline reference value shall be determined acceptable providing the indicated accuracy of the new reference value does not exceed the range or indicated accuracy allowables of OM-6.

Note: This relief request was previously approved for the Third 10-Year Interval as IST-RR-28 via NRC Safety Evaluation Report dated June 30, 1997.

APPENDIX B

VALVE RELIEF REQUESTS

VRR-01	Code Case OMN-2 applied to CC Thermal Relief Valves
VRR-02	Exercise Testing of Control Valves
VRR-03	Service Water Emergency Supply Valves to Spent Fuel Pool Cooling
VRR-04	SI-21A, -21B, -22A, -22B SI Accumulator Discharge Check Valves
VRR-05	SI-350A, -350B Sump B Supply to RHR Isolation Valves

VALVE RELIEF REQUEST - VRR-01

System:	Component Cooling Water
Valve(s):	CC-401A CC-401B
Category:	C Code Class: 3
Function:	These relief valves are located in the CCW outlet lines from RHR heat exchangers 1A&1B and discharge downstream of the outlet isolation valves CC-403A&B. The valves provide thermal overpressure protection for the shellside of the heat exchanger when the CCW inlet and outlet isolation valves are in the closed position. In this alignment, an overpressure condition could occur as a result of thermal expansion of trapped liquid. Due to the safety related function performed by the RHR heat exchangers, these relief valves shall be included in the IST program scope.
Code Requirement:	Section 1.3.4 of Part 1 of the Code requires that 20% of the valves of each type and manufacture be tested within any 48 months. This 20% shall be previously untested valves if they exist.
Alternate Testing:	In accordance with ASME OM Code 1998 Appendix I, paragraph I-1390, and Code Case OMN-2, "Thermal Relief Valve Code Case, OM Code-1995, Appendix I", These valves will be tested or replaced once every ten years, unless performance data indicates more frequent testing or replacement is necessary.
Basis For Relief:	Pursuant to 10 CFR 50.55a(a)(3)(i), relief is being requested on the basis that the proposed alternative provides an acceptable level of quality and safety. OM Code 1998 Appendix I defines thermal relief application as "a relief device whose only overpressure protection function is to protect isolated components, systems or portions of systems from fluid expansion caused by changes in fluid temperature". These Code Class 3 valves can be classified as thermal reliefs in that they are installed on heat exchangers and discharge to the downstream side of the heat exchanger isolation valves. Therefore, they do not provide any system overpressure protection and only protect the heat exchanger when the isolation valves are closed. Additionally, these valves are located in the Component Cooling system such that removal for testing requires a complete system shutdown. This, in turn, requires a full core off load. Therefore, based on the current 18 month refueling outage frequency, a full core off load would be required every other refueling outage to meet the 20% tested within any 48 month requirement. Note: This Relief Request was previously approved during the Third 10-Year. Interval, as IST-RR-31, via NRC Safety Evaluation Report dated March

27,2001. It should be noted that the previously approved relief request was applicable to a total of 9 valves all within the Component Cooling Water System. Since then, a complete IST rescoping effort has occurred resulting in the removal of 7 of the 9 valves from the IST program scope. Those valves removed were associated with components not required for accident mitigation or to achieve/maintain safe shutdown which is the scoping criteria specified in both Part 1 and Part 10 of the OM Code.

VALVE RELIEF REQUEST - VRR-02

System:	Residual Heat Removal Main Steam Chemical and Volume Control
Valve(s):	RHR-8A RHR-8B SD-3A SD-3B CVC-7
Category:	A (CVC-7) Code Class: 2 B (RHR-8A&B and SD-3A&B)
Function:	These air operated control valves perform a safety function as defined within the scope of the ASME OM Code.
Code Requirement:	Limiting value(s) of full-stroke time of each power-operated valve shall be specified by the owner [para. 4.2.1.4(a)]. Test results shall be compared to the initial reference values or reference values established in accordance with paras. 3.4 and 3.5 (para. 4.2.1.8).
Alternate Testing:	KNPP proposes to full-stroke exercise the above valves and verify the valves exhibit smooth stroke by locally observing the valve and verifying the lack of any abnormality or erratic action without imposing limiting value(s) of full stroke times or stroke time acceptance criteria. Any abnormality or erratic action experienced during valve exercising shall be recorded in the record of tests, and an evaluation shall be performed regarding need for corrective action. Exercise frequencies are individually justified by the appropriate deferred test justification.
Basis For Relief:	Pursuant to 10 CFR 50.55a(a)(3)(i), relief is being requested on the basis that proposed alternative testing provides an acceptable level of quality and safety. These valves are not provided with conventional position indication and control switch circuitry, but are provided with a percent open thumb wheel. This control circuitry creates the potential for the inability to acquire repeatable test results when stroke timing, which could result in a failed test and an inoperable valve when the valve is operating acceptably. It is impractical to meet the requirements of the Code for measuring stroke time of these valves because of the design of the valves control systems. Valve exercising by the control station thumb wheel while locally observing the valve to verify the lack of any abnormality or erratic action is an acceptable alternative method to demonstrate valve operational readiness without affecting plant safety or unnecessarily declaring the valve inoperable.

Note: Similar relief request (IST-RR-12) was previously granted during the Third 10-Year Interval by NRC Safety Evaluation Report dated July 15, 1994 as IST-RR-12. The application of this relief request to RHR-8A&B and SD-3A&B is pending approval by the NRC.

VALVE RELIEF REQUEST - VRR-03

System: Service Water
Spent Fuel Pool Cooling

Valve(s): SW-1497 SW-1501

Category: B (SW-1497) C (SW-1501) Code Class: 3

Function: These valves perform an active safety function as defined within the scope of the ASME OM Code. The valves must be capable of changing position subsequent to aligning emergency makeup supply line from service water to the spent fuel pools. KNPP fuel pools provide a large heat absorption capacity precluding the necessity for redundancy of any active components within the Spent Fuel Pool Cooling system. During the unlikely event of a loss of heat removal or a sudden loss of pool inventory, service water is credited as the qualified makeup supply source (re: NRC SER for Amendment No. 150, January 23, 2001)

Code Requirement: Active Category A and B valves shall be tested nominally every 3 months except as provided by paras. 4.2.1.2, 4.2.1.5, and 4.2.1.7. (para. 4.2.1.1)

Check valves shall be exercised nominally every 3 months except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5. (para. 4.3.2.1)

Alternate Testing: To verify full stroke capability of check valve SW-1501, the valve will be disassembled and inspected at intervals not to exceed 60 months using Generic Letter 89-04 as guidelines. Subsequent to reassembly, partial-stroke exercise cannot be performed, as it would introduce service water into the spent fuel pool cooling system. If inability of the valve disk to reach the full-stroke position is noted in the inspection, the condition will be corrected and the frequency of valve disassembly/inspection will be increased to every other refueling outage. More frequent disassembly could result in maintenance induced failures.

Consistent with the exercise frequency of SW-1501, full-stroke exercising of manual valve SW-1497 will be performed at intervals not to exceed 60 months. If the valve fails to exhibit the required change of obturator position it shall be declared inoperable and repaired or replaced.

Basis For Relief: Pursuant to 10 CFR 50.55a(f)(6)(i) and (a)(3)(ii), relief is being requested on the basis that conformance is impractical for the facility and compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The spent fuel pool cooling system is in continuous operation to remove residual heat generated by the stored spent fuel. Exercising these valves to their active

safety positions would require either terminating spent fuel pool cooling water flow or aligning service water to the spent fuel pool cooling system. Either of these activities would have an adverse impact on plant safety.

Terminating cooling water flow for the short term would have no adverse impact, but under worst case conditions, being a full core offload, analysis has demonstrated that there would be at least 8.3 hours available for corrective actions prior to the spent fuel pool boiling, and a minimum of 48.5 hours before the water boils to below the minimum shielding depth (10 feet above the racks). These calculations were based on maximum heat loads; however, under less severe heat loads, more frequent termination of cooling water flow than that specified in alternative testing is inadvisable due to the lack of redundancy in the spent fuel cooling system. The intrusion of service water impurities into the spent fuel pool would result in upsetting water chemistry and the potential of damaging the integrity of the stored fuel rods.

The service water supply valves, SW-1497 and SW-1501, are in a relatively mild environment with extremely limiting factors to contribute to valve degradation. Satisfying all testing requirements for these valves simultaneously is preferred. It should be noted that makeup water is available from various sources and that service water would be used as a last resort, but pursuant to the guidelines of NUREG-0800, Standard Review Plan (SRP) 9.1.3.III.1.f, service water is the designated seismic category 1 makeup system. Furthermore, approval of this relief request will allow the specified alternative tests to be performed a reasonable length of time (less than 8 weeks) prior to a refueling outage to take advantage of the low heat load demand on the spent fuel pool cooling at that time.

Note: Similar relief request was previously submitted for the Third 10-Year Interval but specifically stated that the component(s) were outside the scope of 10 CFR 50.55a. That request for relief was addressed by NRC Safety Evaluation Report dated July 15, 1994 as IST-RR-25. The application of this relief request to SW-1497 is pending approval by the NRC.

VALVE RELIEF REQUEST - VRR-04

System: Safety Injection

Valve(s): SI-21A SI-21B SI-22A SI-22B

Category: C Code Class: 1
AC (SI-22B)

Function: These check valves are located in the safety injection line to the RCS Loop A&B cold legs from the SI accumulators. The valves perform an active safety function in the open direction. They must be capable of opening when RCS pressure falls below accumulator pressure (~700 psig). This function is a passive means of providing emergency core cooling in the event of a loss-of-coolant accident

Code Requirement: Check valves shall be exercised nominally every 3 months except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5. (para. 4.3.2.1)

As an alternative to the testing in 4.3.2.4(a) or 4.3.2.4 (b) above, disassembly every refueling outage to verify operability of check valves may be used. (para. 4.3.2.4.c) Where (a) is exercising by flow or other positive means and (b) by utilizing a manual mechanical exercising.

Alternate Testing: These check valves will be part-stroke exercised during cold shutdowns in a manner demonstrating that the disk moves freely off its seat by comparison of pressure differential and flow rate. In addition, each of these valves will be disassembled and inspected at least once nominally during the 120-month interval in order to verify the ability of the valve to open to the full-stroke position. The disassembly, inspection and corrective action will use Generic Letter 89-04, Position 2, as guidance and a post-inspection part stroke will be perform following reassembly. If the disassembled valve is not capable of being full-stroke exercised, or if there is binding or failure of valve internals, the remaining valves in this group will be disassembled, inspected and manually full-stroke exercised during the same outage. Complete disassembly and inspection beyond what is stated here would be particularly burdensome with little or no improvement to safety, and may actually be detrimental to safety.

Basis For Relief: Pursuant to 10 CFR 50.55a(f)(6)(i) and (a)(3)(ii), relief is being requested on the basis that conformance is impractical for the facility and compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

These check valves will be part-stroke exercised during cold shutdowns (re: CSJ-18). It is never feasible to exercise these check valves at design basis LOCA flow rates (approx. 14,000 gpm). Further, frequent disassembly and inspection of these valves is particularly burdensome because:

1. It requires defueling,
2. It requires draining of the reactor vessel,
3. Frequent disassembly is inconsistent with ALARA principles, with radiation dose rates as high as 1400 mRem/hr,
4. All previous inspections have found no degradation that could lead to the inability of the valves to open to their open position,
5. All previous inspections have found that the valves could open to the full-stroke position,
6. A large number of man hours are required for planning the disassembly/inspection, attaining the required plant conditions, performing the disassembly/inspection, documenting the findings, and performing the necessary Quality Control measures.
7. Unnecessarily disassembling the valves greatly increases the risk of a maintenance induced failure,
8. Inspection of all four of these valves in 1990, after 16 years of power operation, showed all of the valves in pristine condition,
9. The probability of a check valve failing to open on demand is very low both at the Kewaunee Plant and industry wide.

Furthermore, non-intrusive acoustic testing equipment has been purchased and a check valve Coordinator has been assigned to develop a Check Valve Performance Monitoring Program, per Appendix II of OM-1995, between KNPP and PBNP. There are full intentions of eventually performing an accumulator dump test at a reduced nitrogen blanket pressure and utilizing acoustic monitoring to detect full open impact.

Note: This relief request was previously conditionally approved as IST-RR-10A for the Third 10-Year Interval via NRC Safety Evaluation Report dated July 15, 1994. Resolution of Anomaly 1 in the preceding SER was addressed via NRC Safety Evaluation Report dated April 16, 1996.

VALVE RELIEF REQUEST - VRR-05

System: Safety Injection

Valve(s): SI-350A SI-350B

Category: B Code Class: 2

Function: These valves are located within separate enclosures outside containment in the lines leading from containment sump "B" to the suction of the RHR pumps. The valves perform an active safety function in the open position. SI-350A&B must be capable of opening, by remote manual switch actuation, when transitioning from the injection mode of SI to sump recirculation for long-term core cooling. The valves also perform an active safety function in the closed position. SI-350A&B are designated containment isolation valves for penetrations 30W and 30E per USAR Table 5.2-2. SI-350A&B must be capable of closure by remote manual switch actuation to maintain containment integrity should an automatic system malfunction occur.

Code Requirement: Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. (para. 4.1)

Alternate Testing: These valves will have remote position indication verification performed on a 36-month frequency. This verification will normally be performed coincident with preventative maintenance on the valve motor operators, which is scheduled on a 36-month frequency. The 36-month frequency is based on past preventative maintenance and inspection results, and corresponds with every other 18-month refueling cycle. In addition, the valves will be leakage tested on a refueling outage frequency to ensure valve closure. These activities in conjunction with quarterly monitoring of valve stroke times will ensure reliable operation of the valves, including remote position indication.

Basis For Relief: Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is being requested on the basis that compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

These valves are containment isolation valves located outside of the containment building in separate enclosures. Local observation of the valves during the performance of position indication verification requires disassembly and removal of the enclosures. Subsequent to reassembly, the enclosures require leak testing in accordance with Appendix J. The additional activities involved with this local observation are time consuming and performed in a Radiation Area. It is KNPPs position that compliance with the 2 year Code requirement for local observation of valve position indication would result in a hardship without a compensating increase in the level of quality and safety.

Note: This relief request was previously approved as IST-RR-29 for the Third 10-Year Interval via NRC Safety Evaluation Report dated September 10, 1998.

APPENDIX C

COLD SHUTDOWN TEST JUSTIFICATIONS

CSJ-01	CC-600
CSJ-02	CC-601A, -601B –612A, -612B
CSJ-03	CVC-11
CSJ-04	CVC-211, -212
CSJ-05	CVC-301
CSJ-06	CVC-7
CSJ-07	LD-2, -3
CSJ-08	LD-6
CSJ-09	LD-60
CSJ-10	MS-1A, -1B
CSJ-11	FW-12A, -12B
CSJ-12	FW-13A, -13B
CSJ-13	PR-1A, -1B
CSJ-14	PR-2A, -2B
CSJ-15	RHR-11
CSJ-16	RHR-1A, -1B, -2A, -2B
CSJ-17	RHR-5A, -5B
CSJ-18	SI-21A, -21B, -22A, -22B
CSJ-19	SI-303A, -303B, -304A, -304B
CSJ-20	CC-3A, -3B
CSJ-21	CVC-14

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-01

System: Component Cooling Water

Valve(s): CC-600

Category: B Code Class: 3

Function: This motor operated valve is located outside containment in the CCW supply header to equipment inside containment. The valve performs an active safety function in the closed position to maintain containment integrity. CC-600 is designated as the outboard containment isolation valve for penetration no. 39 per USAR Table 5.2-2. As a secondary boundary barrier to a closed system inside containment, CC-600 may require closure by remote manual switch actuation as an available option should unexpected conditions make such an action desirable to maintain containment integrity. However, this is not an expected occurrence due to the integrity of the piping system. Valve CC-600 also functions to provide isolation capability to prevent a loss of CCW system inventory in the event of a failure of the cooling water line supplying the excess letdown heat exchangers. Isolation of CCW to a faulted line would preserve system integrity for long term cooling of essential safety-related equipment. The valve has no safety function in the open position. The normally open position of CC-600 provides a path for CCW supply flow to the excess letdown heat exchangers and RCP motor bearings and thermal barrier; however, this function is not considered safety-related. CCW supply and return flow to the RCP thermal barrier is a safety significant function for the protection of RCP seal integrity, but is not required to mitigate the consequences of an accident or to achieve/maintain the plant in a safe shutdown condition.

Deferred Test Justification: Full stroke exercising these valves quarterly during power operation would result in interrupting cooling water flow to the RCP motors bearings and thermal barriers. Should the valve fail to reopen damage could occur to the RCP motors and thermal barriers rendering the associated RCP inoperable. TS 3.1.a.1.B requires both RCPs to be in operation when the reactor is in the operating mode.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Valve full stroke exercising shall be performed during cold shutdowns when plant conditions do not require the RCPs to be operable. If plant conditions do not permit the removal of the RCPs from service, the valve shall be appropriately tested at refueling. The performance of this testing during extended cold shutdowns when conditions permit or at least each refueling is acceptable per the discussion provided in NUREG-1482, Section 3.1.1.4.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-02

System: Component Cooling Water

Valve(s): CC-601A CC-601B CC-612A CC-612B

Category: B Code Class: 3

Function: These motor operated valves are located outside containment in the CCW individual supply and return lines to the RCPs' motor bearings and thermal barriers. The valves perform an active safety function in the closed position to maintain containment integrity. The valves are designated as the outboard containment isolation valves for penetration nos. 32E&N and 33E&N per USAR Table 5.2-2. This table also identifies the barrier inside containment as being a closed system. As secondary boundary barriers to a closed system, the valves may require closure by remote manual switch actuation as an available option should unexpected conditions make such an action desirable to maintain containment integrity. However, this is not an expected occurrence due to the integrity of the piping system. These valves have no safety function in the open position. The normally open position of the valves provide a supply and return path for CCW flow to the RCP motor bearings and thermal barrier; however, this function is not classified as safety-related. CCW supply to the RCP thermal barrier is a safety significant function for the protection of RCP seal integrity, but is not required to mitigate the consequences of an accident or to achieve/maintain the plant in a safe shutdown condition.

Deferred Test Justification: Full stroke exercising these valves quarterly during power operation would result in interrupting cooling water flow to the RCP motors bearings and thermal barriers. Should the valve fail to reopen damage could occur to the RCP motors and thermal barriers rendering the associated RCP inoperable. TS 3.1.a.1.B requires both RCPs to be in operation when the reactor is in the operating mode

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Valve full stroke exercising shall be performed during cold shutdowns when plant conditions do not require the RCPs to be operable. If plant conditions do not permit the removal of the RCPs from service, all of the valves shall be appropriately tested at refueling. The performance of this testing during extended cold shutdowns when conditions permit or at least each refueling is acceptable per the discussion provided in NUREG-1482, Section 3.1.1.4.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-03

System: Chemical and Volume Control

Valve(s): CVC-11

Category: B Code Class: 1

Function: This normally open, air operated valve is located in the charging line to the RCS loop B cold leg on the outlet side of the regenerative heat exchanger. CVC-11 performs no safety function in the open position. The valve opens to support normal process functions performed by the CVCS. This valve performs an active safety function in the closed position. CVC-11 is an ASME Class 1 to ASME Class 2 RCS pressure boundary valve as defined in 10CFR50.2. As a normally open RCS pressure boundary valve, CVC-11 must be capable of closure to maintain RCS integrity in the event of a line break upstream. The valve fails to its safety related closed position on a loss of air or electrical power.

Deferred Test Justification: Full stroke exercising these valves quarterly during power operation would require interrupting normal charging flow. The interruption of normal charging flow is not practical during power operation due to the potential of causing a pressurizer level control transient. In addition, closure of CVC-11 would isolate charging flow to the regenerative heat exchangers resulting in high letdown temperatures. Reestablishing flow to the heat exchanger could lead to thermal shocking potentially resulting in a tube side failure.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Full stroke exercising shall be performed during cold shutdowns when the normal charging and letdown functions are not required.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-04

System: Chemical and Volume Control

Valve(s): CVC-211 CVC-212

Category: A Code Class: 2

Function: These power operated valves are located in the CVCS seal water return line from the RCP shaft seals to the VCT. The valves have no safety function in the open position. The normal seal water return line flow path is not required for accident mitigation or to bring the plant to safe shutdown. These valves perform an active safety function in the closed position. CVC-211 and -212 are designated containment isolation valves for containment penetration 14. As containment isolation valves, they must be capable of automatic closure upon receipt of a containment isolation "T" signal to maintain containment integrity. The valves also receive Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: Exercising these valves quarterly during normal operation would result in challenging the seal return relief valve CVC-261 and could cause a loss of RCS water to the pressurizer relief tank. Redirecting seal water return flow to the PRT would present an inconvenience to operations by requiring PRT level adjustment but would have no impact on plant safety. However, should CVC-261 lift and fail to reclose uncontrolled discharge of seal water return flow to the PRT would occur.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Full stroke exercising shall be performed during cold shutdowns when plant conditions permit the removal of the RCPs from service. If plant conditions do not permit the removal of the RCPs from service, all of the valves shall be appropriately tested at refueling. The performance of this testing during extended cold shutdowns when conditions permit or at least each refueling is acceptable per the discussion provided in NUREG-1482, Section 3.1.1.4.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-05

System:	Chemical and Volume Control
Valve(s):	CVC-301
Category:	B Code Class: 2
Function:	This normally closed motor operated valve is located in the supply line from the RWST to the charging pumps' suction. The valve performs a safety function in the closed position to maintain the pressure boundary of the RWST. The RWST is relied on as a borated water supply source for internal containment spray and safety injection during post-LOCA conditions. This valve performs no safety function in the open position. CVCS pump suction could be aligned to the RWST, if the boric acid storage tanks are unavailable, to provide an alternate means of borating the RCS or upon depletion of VCT inventory to maintain NPSH for the pumps. However, this function is not safety-related. The credited means of providing emergency boration is by utilizing the safety injection pumps.
Deferred Test Justification:	Full stroke exercising this valve would result in aligning the RWST to the charging pumps' suction header. If performed quarterly during power operation, this alignment would allow RWST inventory, with its high boric acid concentration (≥2400 ppm), to be injected into the RCS via the charging line and the RCP pump seals. Injecting RWST inventory into the RCS would result in severe power fluctuations and possible plant shutdown.
Quarterly Partial Stroke Testing:	The valve control circuitry is not provided with partial stroke capability; however, partially exercising the valves would result in the same consequences as full stroke exercising.
Alternate Test Frequency:	Full stroke exercising shall be performed during cold shutdowns when RCS reactivity will not be affected.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-06

System: Chemical and Volume Control

Valve(s): CVC-7

Category: B Code Class: 2

Function: This normally open, air operated flow control valve is located in the CVCS charging header to the regenerative heat exchanger. The valve performs no safety function in the open position. CVC-7 is normally used for the process function of balancing flow between the charging line and the RCP seal water supply. The valve must be capable of opening to support the normal process functions performed by the CVCS. This valve performs an active safety function in the closed position. CVC-7 is a designated outboard isolation valve for containment penetration 12, per USAR Table 5.2-2. As such, CVC-7 must be capable of closure, by remote manual switch actuation, to maintain containment integrity. CVC-7 receives Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: Full stroke exercising these valves quarterly during power operation would require interrupting normal charging flow. The interruption of normal charging flow is not practical during power operation due to the potential of causing a pressurizer level control transient resulting in a reactor trip. In addition, closure of CVC-7 would isolate charging flow to the regenerative heat exchangers resulting in high letdown temperatures. Reestablishing flow to the heat exchanger could lead to thermal shocking potentially resulting in a tube side failure.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Full stroke exercising shall be performed, per VRR-02, during cold shutdowns when the normal charging and letdown functions are not required.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-07

System: Reactor Coolant

Valve(s): LD-2 LD-3

Category: B Code Class: 1

Function: These normally open, air operated valves are located in the normal letdown line from the RCS loop B hot leg to the regenerative heat exchanger. They have no safety function in the open position. The process function of normal letdown serves to; maintain a constant RCS inventory, remove impurities, and adjusts boric acid concentration. These valves perform an active safety function in the closed position. The valves serve a Class 1 to Class 2 RCS boundary barrier function as defined in 10CFR50.2. As RCS boundary barrier valves, LD-2 and LD-3 must be capable of closure subsequent to a line break in the downstream Class 2 piping to prevent the uncontrolled release of reactor coolant. Isolation of a break in the Class 2 piping assures continued functioning of the normal means of heat dissipation from the core. Closure of LD-2 and LD-3 is also required subsequent to a VCT rupture thereby isolating letdown flow and maintaining offsite dose releases within the limits specified in the VCT rupture analysis (re: USAR 14.2.3). In addition, LD-2 and LD-3 automatically isolate the letdown line on low pressurizer level to prevent uncovering the pressurizer heater elements. However, this auto closure function is for component protection and considered non-safety related.

Deferred Test Justification: Exercising these valves to the closed position quarterly during power operation would require interrupting normal letdown flow. The interruption of normal letdown flow is not practical during power operation due to the potential of causing a pressurizer level control transient resulting in a reactor trip. In addition, failure of a letdown valve to reopen, subsequent to closure, while continuing to provide normal charging flow could result in a high RCS water level trip.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability. Valve is open during normal power operation.

Alternate Test Frequency: Full stroke exercising shall be performed during cold shutdowns when the normal charging and letdown functions are not required.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-08

System: Chemical and Volume Control

Valve(s): LD-6

Category: A Code Class: 2

Function: This air-operated valve is located in the normal letdown line from the RCS loop "B" to the letdown heat exchanger. LD-6 has no safety function in the open position. The process function of normal letdown serves to maintain a constant RCS inventory, impurity removal, and boric acid concentration adjustment. These functions are not required for accident mitigation or to achieve/maintain the plant in a safe shutdown condition. This valve performs an active safety function in the closed position. Per USAR Table 5.2-2, LD-6 is the designated outboard isolation valve for containment penetration 11. As a containment isolation valve, LD-6 must be capable of automatic closure upon receipt of a containment isolation "T" signal to maintain containment integrity. The valve receives Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: Exercising this valve to the closed position quarterly during power operation would require interrupting normal letdown flow. The interruption of normal letdown flow is not practical during power operation due to the potential of causing a pressurizer level control transient resulting in a reactor trip. In addition, failure of a letdown valve to reopen, subsequent to closure, while continuing to provide normal charging flow could result in a high RCS water level trip.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability.

Alternate Test Frequency: Full stroke exercising shall be performed during cold shutdowns when the normal charging and letdown functions are not required.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-09

System: Chemical and Volume Control

Valve(s): LD-60

Category: B Code Class: 2

Function: This normally closed motor operated valve is located in the RHR to CVCS letdown line. The valve has no safety related function in the open position. LD-60 is placed in the open position during plant cooldown when the RHR loop is operating and the letdown orifices are not in service. This alignment allows a portion of flow leaving the RHR heat exchangers to pass through the letdown heat exchangers, letdown filter, mixed bed demineralizers, reactor coolant filter and volume control tank for the purpose of removing corrosion impurities and fission products. This valve performs an active safety function in the closed position. LD-60 is a designated inboard isolation valve for containment penetration 10, per USAR Table 5.2-2. As an inboard containment isolation valve, LD-60 must be capable of closure, by remote manual switch actuation, to maintain containment integrity should an automatic system malfunction occur or a faulted condition occur in the associated piping. This valve is exempt from Appendix J, Type C, leak testing requirements due to the presence of a water seal during post-accident conditions.

Deferred Test Justification: Full stroke exercising this valve quarterly during power operation could result in overpressurizing RHR piping from the higher operating pressure of CVCS letdown. RHR system piping is maintained in a solid condition when in standby; therefore, diverting letdown flow could easily create an overpressure condition.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability. Although, partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Full stroke exercising will be performed during cold shutdowns when CVCS charging and letdown are removed from service and RHR is aligned to letdown.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-10

System: Main Steam

Valve(s): MS-1A MS-1B

Category: B/C Code Class: 2

Function: These normally open, air operated check valves are located in the main steam headers from the steam generators and serve as the main steam isolation valves (MSIV). The valves perform an active safety function in the closed direction to prevent the unrestricted release of steam from the steam generators during a main steam line break (MSLB). This function prevents blowdown from more than one steam generator for a break upstream or downstream of an MSIV. Additionally, the MSIVs are designated outboard containment isolation valves for containment penetrations 6E&W. As containment isolation valves, they must also be capable of closure to maintain containment integrity. The valves have no safety function in the open direction. The MSIVs remain open during normal operation to allow steam flow from the steam generators to the main turbine to support power generation.

Deferred Test Justification: Exercising these valves during normal operation isolates one line of steam flow to the turbine. Isolation of a main steam header would cause a severe pressure transient in the associated main steam line possibly resulting in a plant trip. Additionally, closure of an MSIV, at power, could potentially result in challenging the set point of the main steam relief valves causing inadvertent lifting. Reducing power level to perform testing without causing a transient would significantly impact plant operations and power production.

Quarterly Partial Stroke Testing: The valve control circuitry is not designed with partial stroke capability. The MSIVs are check valves that open against the direction of steam flow allowing rapid closure for steam line isolation.

Alternate Test Frequency: The MSIVs will be full stroke exercised, stroked timed, and fail-safe tested to the closed position during hot shutdown or immediate shutdown. Testing per a cold shutdown test justification is recommended by NUREG-1482 Section 3.1.1.1.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-11

System: Feedwater

Valve(s): FW-12A FW-12B

Category: B Code Class: 2

Function: These normally open motor operated valves are located outside containment in the normal feedwater flow path to steam generators. The valves perform an active safety function in the closed position to provide feedwater isolation subsequent to a MSLB. Isolating feedwater flow subsequent to a MSLB decreases the blowdown rate from the steam line break, which reduces cooling of the primary system and reduces the post-accident containment pressure by limiting the energy mass release to containment. FW-12A&B auto closes upon receipt of a SI signal. Additionally, FW-12A&B are designated as outboard containment isolation valves for penetrations 7E and 7W per USAR Table 5.2-2. As such, the valves must be capable of closure as a secondary boundary barrier to a closed system for containment isolation. The valves have no safety function in the open position. Normal feedwater flow is necessary for steam production during normal plant operation.

Deferred Test Justification: Exercising the feedwater isolation valves closed quarterly during power operation would result in a loss of normal feedwater flow to the associated Steam Generator. Isolation of normal feedwater flow during power operation could potentially cause a severe steam generator level transient which could result in a plant trip, and could initiate an auxiliary feedwater system actuation signal unnecessarily.

Quarterly Partial Stroke Testing: The valve is not provided with partial stroke capability.

Alternate Test Frequency: Full stroke exercise testing will be performed during hot/immediate shutdown conditions or during refueling outages when feedwater is removed from service. NUREG-1482, Section 3.1.1.1 discusses when testing during these conditions designating the frequency as cold shutdown testing is acceptable

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-12

System: Feedwater

Valve(s): FW-13A FW-13B

Category: C Code Class: 2

Function: These normally open check valves are located inside containment in the normal feedwater flow path to steam generators. The valves perform an active safety function in the closed direction. The AFW injection line ties in downstream of the feedwater check valve. FW-13A&B must be capable of closure upon cessation or reversal of flow during a loss of normal feedwater to prevent the diversion of AFW flow to the non-safety-related feedwater piping. Also, subsequent to feedwater isolation during a SGTR or MSLB, automatic closure of FW-13A or B on reversal of flow serves to isolate the ruptured steam generator. These requirements for isolation capability are redundant to that provided by upstream motor operated valves FW-12A&B. These valves have no safety function in the open position. Normal feedwater flow is necessary for steam production during normal plant operation but is not required for accident mitigation or to achieve/maintain safe shutdown of the plant

Deferred Test Justification: Exercising the feedwater injection check valves in the reverse direction is impracticable quarterly during power operation due to the necessity of isolating normal feedwater flow to the associated steam generator. Isolation of feedwater flow during normal operation would cause a loss of steam generator level control potentially resulting in a plant trip.

Quarterly Partial Stroke Testing: Partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: These check valves will be exercised in the closed direction by establishing a differential pressure across the seat during hot/intermediate shutdown or refueling when feedwater is not required to be inservice. NUREG-1482, Section 3.1.1.1 discusses when testing during these conditions designating the frequency as cold shutdown testing is acceptable

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-13

System(s): Reactor Coolant

Valve(s): PR-1A PR-1B

Category(s): B Code Class: 1

Function: These normally open motor operated valves are located upstream of the pressurizer PORVs and serve as the block valves. The valves perform an active safety function in the open position. If closed to contain PORV seat leakage, the block valves must be capable of opening to provide a path for communication between the PORVs and the pressurizer. Reestablishing communication between the PORVs and the pressurizer may be required to allow depressurization the RCS during a steam generator tube rupture (SGTR). The valves also perform an active safety function in the closed position. They must be capable of closure by remote manual switch actuation in the event of excessive leakage past the associated PORV or during the event the PORV fails to close. This function serves to maintain RCS pressure boundary.

Deferred Test Justification: The function of the block valves, as previously stated, is to isolate a leaking PORV. When in this condition, stroke timing the block valve providing the isolation function and its failure to reclose would result in uncontrolled RCS discharge to the PRT, a loss of pressurizer pressure control, and potential inadvertent depressurization. Exercising a block valve during power operation when isolating a PORV, per TS 3.1.a.5.A, is impractical due to the potential consequences of RCS discharge to the PRT and a loss of pressurizer pressure control.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability. Although, partial stroke exercising at power would result in the same consequences as full stroke exercising.

Alternate Test Frequency: These valves are stroke timed on a quarterly frequency and will continue on this frequency unless closed to isolate a leaking PORV. If closed to isolate a leaking PORV, power will be maintained to the valve per TS 3.1.a.5.A but exercising will be deferred until the next plant shutdown.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-14

System: Reactor Coolant

Valve(s): PR-2A PR-2B

Category: B Code Class: 1

Function: These normally closed air operated valves function as pressurizer power operated relief valves (PORVs) and also serve as Class 1 to non-Code boundary barriers. The valves perform an active safety significant function in the open position to provide a means for quick depressurization of the RCS during a steam generator tube rupture (SGTR). The use of the PORVs for depressurization during SGTR recovery is the qualified backup for the normal and auxiliary pressurizer spray valves and will be used only if depressurizing by normal spray is unavailable. The PORVs also perform an active safety function in the closed position. The PORVs must be capable of closure by remote manual switch actuation, if open, to maintain RCS pressure boundary. This function minimizes the potential for uncontrolled RCS discharge to the PRT and a loss of pressurizer pressure control. It should be noted that the motor operated block valves would provide isolation in the event a PORV failure to close.

Deferred Test Justification: Full stroke exercising the PORVs quarterly during power operation is not practical due to the high probability of their sticking in the open position or failure to provide a leak tight barrier when closed. In addition, exercising the valves at power could potentially cause a large pressure drop in the RCS resulting in a pressure transient and a low pressure trip signal generated by the reactor protective instrumentation. Exercising the valve at power could also result in lifting the PRT relief valve or blowing out the PRT rupture disk.

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability. In addition, partially exercising the valves would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Exercise testing shall be performed during Hot or Immediate shutdowns in accordance with GL 90-06. NUREG-1482, Section 3.1.1.1 discusses when testing during these conditions designating the frequency as cold shutdown testing is acceptable

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-15

System: Residual Heat Removal

Valve(s): RHR-11

Category: B   Code Class: 1

Function: This normally closed, motor-operated valve is located in the RHR return line to the RCS loop "B" cold leg. The valve performs an active Augmented function important to safety in the open position. Although KNPP is licensed as hot shutdown being safe shutdown, RHR-11 must be capable of opening by remote manual switch actuation for initiation of RHR normal shutdown cooling during the recovery of a SGTR and MSLB. Although, the shutdown cooling mode of RHR is not required to achieve safe shutdown of the plant, as licensed, it is however considered a risk significant function and components supporting this function shall be subject to augmented testing. This valve performs an active safety function in the closed position. RHR-11 is a designated isolation valve for containment penetration 10, per USAR Table 5.2-2. As such, RHR-11 must be capable of closure by remote manual switch actuation to maintain containment integrity.

Deferred Test Justification: Exercising this valve quarterly during power operation would require defeating an interlock and protective measures intended to protect the RHR system piping and components from overpressurization from the RCS. Interlocks and protective lockouts are provided to prevent inadvertent opening of the valves when RCS pressure is greater than the RHR system design pressure. Full or partial-stroke exercising at power would result in overpressurizing the RHR system piping and a loss of containment integrity. Valve exercising shall be performed during cold shutdown when RCS pressure is less than RHR system design pressure.

Quarterly Partial Stroke Testing: The control circuitry of the valves is not provided with partial stroke capability. In addition, partially exercising the valve would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Full stroke exercise testing shall be performed during cold shutdowns when RCS pressure is less than RHR system design pressure.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-16

System: Residual Heat Removal

Valve(s): RHR-1A RHR-1B
RHR-2A RHR-2B

Category: B Code Class: 1

Function: These normally closed motor operated valves are located in the RHR supply lines from the RCS loop "A&B" hot legs. The valves perform an active safety function in the open position. They must be capable of opening by remote manual switch actuation, when RCS pressure is less than 425 psig and RCS temperature is less than or equal to 200° F to allow communication between the RCS and low temperature overpressure protection (LTOP) valve RHR-33-1. The valves must also open to accomplish the Augmented function of RHR normal shutdown cooling. Although, the shutdown cooling mode of RHR is not required to achieve safe shutdown of the plant, as licensed, it is however considered a risk significant function and components supporting this function shall be subject to augmented testing. These valves perform an active safety function in the closed position. They are designated as isolation valves for containment penetration 9, per USAR Table 5.2-2. As such, they must be capable of closure by remote manual switch actuation to maintain containment integrity. The normally closed position of these valves during power operation preserves the pressure boundary integrity of the RCS and serves to maintain RHR system pressure boundary integrity by providing a two valve isolation barrier between the RCS and the lower design pressure piping of the RHR system.

Deferred Test Justification: Exercising these valves quarterly during power operation would require defeating an interlock and protective measures intended to protect the RHR system piping and components from overpressurization from the RCS. Interlocks and protective lockouts are provided to prevent inadvertent opening of the valves when RCS pressure is greater than the RHR system design pressure. Full or partial-stroke exercising at power would result in overpressurizing the RHR system piping and a loss of containment integrity. Valve exercising shall be performed during cold shutdown when RCS pressure is less than RHR system design pressure.

Quarterly Partial Stroke Testing: The control circuitry of the valves is not provided with partial stroke capability. In addition, partially exercising the valve would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Full stroke exercise testing shall be performed during cold shutdowns when RCS pressure is less than RHR system design pressure.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-17

System: Residual Heat Removal

Valve(s): RHR-5A RHR-5B

Category: C Code Class: 2

Function: These normally closed check valves are located in the discharge lines from RHR pumps to the heat exchangers. The valves perform an active safety function in the open position. RHR-5A&B must be capable of opening subsequent to the associated pump starting to provide a path for post-LOCA low head safety injection and sump recirculation flow to the RCS, as well as providing sump recirculation to the suction supply of SI and ICS pumps. These valves also perform an augmented function important to safety in the open direction to support the shutdown cooling mode of RHR. Although, achieving cold shutdown is not necessary for placing the plant in a safe shutdown condition, it is however considered a risk significant function. These valves also perform an active augmented function important to safety in the closed direction. RHR-5A&B must be capable of closure on reversal of flow, if the associated pump is secured or unavailable, to maintain separation of the RHR trains when operating in the normal shutdown cooling mode. When RHR is aligned for normal shutdown cooling, the manual cross-connect valves are placed in the open position allowing communication between the trains. Therefore, closure of this check valve prevents diversion of flow from the discharge of the opposite train to the suction side of the idle train.

Deferred Test Justification: During quarterly pump testing suction supply is provided from the RWST and utilizes the ICS piping as a recirculation flow path back to the RWST. Exercising these valves in the forward direction would require aligning the RHR pump suction to the RCS loop A or B hot leg. To open the upstream pressure isolation valves would require defeating an interlock and protective measures intended to protect the RHR system piping and components from overpressurization from the RCS. This low pressure line can not be exposed to reactor coolant pressures. In addition, the RHR pumps have insufficient discharge head to overcome RCS pressure. Testing will be performed during cold shutdown, with RHR operating in the shutdown cooling mode. This mode of operation crossties the two trains both upstream and downstream of the heat exchangers. Individual flow through each check valve cannot be determined when both pumps are operating during RHR shutdown cooling.

Quarterly Partial Stroke Testing: These check valves shall be exercised in the partially open direction during quarterly pump testing.

Alternate Test
Frequency: Full stroke exercise tests in the forward and reverse directions shall be performed during cold shutdowns when RHR is aligned for shutdown cooling with single pump operation.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-18

System(s): Safety Injection

Valve(s): SI-21A SI-21B SI-22A SI-22B

Category(s): C Code Class: 1
AC (SI-22B)

Function: These normally closed check valves are located in the safety injection line to the RCS Loop A&B cold legs from the SI accumulators. The valves perform an active safety function in the open direction. They must be capable of opening when RCS pressure falls below accumulator pressure (~700 psig). This function is a passive means of providing emergency core cooling in the event of a loss-of-coolant accident. With the exception of SI-22B, the valves perform a passive safety function in the closed direction as ASME Class 1 to Class 2 boundary barrier valves. The normally closed position prevents RCS inleakage to the accumulator, which is of a lower design pressure. SI-22B performs an RCS pressure isolation valve (PIV) safety function, per Table TS 3.1-2, it is seat leakage tested to demonstrate leak-tight sealing capability as required by Technical Specification 4.2.a.3 and the OM Code.

Deferred Test Justification: Exercising these valves to the full open or partially open position quarterly during power operation is not possible due to the inability of overcoming RCS pressure. The accumulators are charged with a nitrogen blanket at ~700 psig which is insufficient to inject accumulator inventory into the RCS during normal operation for full or partial exercising. Likewise, the SI pumps have insufficient discharge head to overcome RCS pressure at power. Full stroke exercising these valves in the forward direction during cold shutdown is precluded by restrictions related to LTOP as addressed in TS 3.1.4.a. Closure capability of SI-22B shall be verified during the performance of seat leakage testing per the requirements TS 4.2.a.3.

Partial Stroke Testing: These valves are partially stroked in the forward direction during cold shutdown by initiating flow with the SI pump.

Alternate Test Frequency: Full stroke capability of the valves will be verified during refueling outages by sample disassembly as outlined in relief request VRR-04. Verification of closure capability for SI-22B shall be demonstrated by performing seat leakage testing per TS 4.2.a.3 during cold shutdown and/or refueling.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-19

System: Safety Injection

Valve(s): SI-303A SI-303B SI-304A SI-304B

Category: AC Code Class: 1

Function: These check valves are located in the train "A" and "B" RHR low head safety injection lines to the reactor vessel. The valves perform an active safety function in the open direction. They must be capable of opening to provide a path for post-LOCA low head safety injection and sump recirculation flow to the reactor vessel for emergency core cooling. These valves also perform an active safety function in the closed direction. These valves provide an ASME Code Class 1 to Class 2 boundary barrier which perform a leakage important safety function as Event V pressure isolation valves (PIV) per TS Table 3.1-2. Their normally closed position preserves the pressure boundary integrity of the RCS and isolates RCS pressure from the attached low pressure RHR piping.

Deferred Test Justification: Exercising these valves in the forward direction quarterly during power operation is not possible due to insufficient pump discharge head to overcome reactor pressure. Exercising the valve in the forward direction during cold shutdown is not desirable unless leak testing per Technical Specification 4.2.a.3 is scheduled to ensure valve leak tight integrity subsequent to closure. Valve exercising in the forward and reverse directions shall be performed during cold shutdown in conjunction with full flow RHR pump testing and the requirements of Technical Specification 4.2.a.3 are scheduled to be performed. Otherwise valve exercising in the forward and reverse directions shall be performed during refueling when sufficient time is available to demonstrate proper seating of the valves per the requirements of Technical Specification 4.2.a.3.

Partial Stroke Testing: Partial stroke exercising is precluded by the same restrictions preventing full stroke exercising.

Alternate Test Frequency: Full stroke exercising in the forward and reverse directions shall be performed during cold shutdown or refueling when sufficient time is available to demonstrate proper seating of the valves per the requirements of Technical Specification 4.2.a.3

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-20

System(s): Component Cooling Water

Valve(s): CC-3A CC-3B

Category(s): C Code Class: 3

Function: These check valves are located in the discharge lines from CCW pumps 1A and 1B. The valves perform an active safety function in the open direction to provide a path for CCW flow to the cooling water header via a CCW heat exchanger. The worse case maximum required flow rate for single pump operation during post-accident conditions is 3780 gpm (A train) and 3810 gpm (B train). This flow rate is the amount required during the unlikely event a single pump is providing flow to both RHR heat exchangers in addition to continued flow to nonessential heat loads that aren't automatically isolated during post accident conditions. Full stroke exercising of the pump discharge check valves shall be considered satisfactory when they have demonstrated the ability to pass the aforementioned flow rate. These check valves also perform an active safety function in the closed direction to prevent diversion of discharge flow from the inservice pump through an idle or out-of-service pump adjacent pump. Closure capability ensures maximum CCW flow is provided to post-accident cooling loads.

Deferred Test Justification: Full stroke exercising these valves in the forward direction with maximum required accident flow quarterly during power operation is not practical due to the necessity of an abnormal system alignment in order to achieve the required flow rates. To achieve the abnormally high flow rates associated with worse case accident conditions would require directing single pump flow to both RHR heat exchangers in addition to maximum flow to the CCW heat exchangers. This alignment could potentially result in upsetting the balance of heat removal from essential and non-essential heat loads from other plant systems during normal operation. The preferred plant condition to perform full stroke exercising of the CCW pumps' discharge check valves is during cold shutdown conditions with both the Reactor Coolant Pumps off. During this plant condition, minimal impact would be experienced on the heat removal requirements of other systems.

Partial Stroke Testing: Partial stroke exercising will be performed during quarterly pump testing.

Alternate Test Frequency: Full stroke capability of these valves will be verified during cold shutdown conditions with both Reactor Coolant Pumps off, when no adverse conditions will result from the abnormal system alignment necessary to achieve the required flow. Exercising in the reverse direction and partial forward exercising is accomplished during quarterly pump testing.

COLD SHUTDOWN TEST JUSTIFICATION - CSJ-21

System(s): Chemical and Volume Control

Valve(s): CVC-14

Category(s): C   Code Class: 2

Function: This normally open check valve is located in the bypass line around charging header valve CVC-11 to the RCS loop B cold leg. The valve performs an active safety function in the partially open direction to provide GL 96-06 thermal overpressure protection for containment penetration 12 if the penetration is isolated during post-LOCA or HELB conditions. Subsequent to isolation, trapped fluid within the isolated boundary could expand when exposed to containment temperatures post-LOCA or HELB causing an overpressure condition to occur. CVC-14 opens to provide a relief path for excessive internal pressure to be relieved via CVC-10 and CVC-12. This valve has no safety function in the closed direction. CVC-14 is an ASME Class 1 to Class 2 RCS pressure boundary isolation valve as defined in 10CFR50.2. However, failure for this valve to close, subsequent to an upstream line break, would not result in a loss of RCS in excess of makeup capability from the CVCS.

Deferred Test Justification: The preferred method to positively verify partial opening capability of this check valve is by isolating the normal charging flow path closing CVC-11 and passing minimum charging system flow through CVC-14. This abnormal system configuration would require the interruption of normal charging flow. Such testing activities if performed during power operation could result in a plant trip or transient due to the interruption of normal charging flow.

Partial Stroke Testing: Verification of partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Opening capability of this check valve shall be verified during cold shutdowns when normal charging and letdown functions are not required.

APPENDIX D

REFUELING OUTAGE TEST JUSTIFICATIONS

ROJ-01	BT-2A-1, -2B-1
ROJ-02	CI-1003
ROJ-03	CVC-10
ROJ-04	CVC-12
ROJ-05	SW-1A1, -1A2, -1B1, -1B2
ROJ-06	CVC-205A, -205B, -206A, -206B
ROJ-07	HS-2203A-1, -2203B-1
	SW-1040A-1, -1040A-2, -1040B-1, -1040B-2, -1042A-1, -1042B-1
ROJ-08	MU-311A, -311B, -311C
ROJ-09	PR-33A, -33B, RC-45A, -45B, -46, -49
ROJ-10	SI-12A, -12B
ROJ-11	SI-13A, -13B
ROJ-12	SI-206A, -206B
ROJ-13	SI-6A, -6B
ROJ-14	SW-501A, -501B
ROJ-15	SI-301A, -301B

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-01

System(s): Steam Generator Blowdown

Valve(s): BT-2A-1 BT-2B-1

Category(s): C Code Class: 2

Function: These check valves are located inside containment in the bypass line around BT-2A&B which are the steam generator shellside blowdown line isolation valves. The valves perform an active safety function in the partial open and closed directions. BT-2A-1 and BT-2B-1 must be capable of partially opening to provide GL 96-06 thermal overpressure protection for containment penetrations 8S and 8N when the penetration isolation valves are closed during post-LOCA or MSLB conditions. As containment isolation valves, BT-2A-1 and BT-2B-1 must be capable of closure on cessation or reversal of flow to maintain containment integrity. Due to a closed system providing the initial containment boundary barrier, Type C seat leakage testing is not required per 10CFR50, Appendix J, per the CLRT Program seat leakage testing is performed as good engineering judgement.

Deferred Test Justification: Exercising these valves partially open or in the reverse direction requires entry into containment and interrupting the normal process function of continuous blowdown. To satisfactorily exercise these check valves requires the use of temporary test equipment inside containment to perform a leak test or back flow test, in addition to passing flow through the valves to demonstrate their partial opening capability. Due to the considerable effort associated with these test activities, exercise testing to the partially open or closed positions quarterly or during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of these check valves shall be performed during refueling outages in conjunction with seat leakage testing. Demonstrating the partial opening capability shall also be performed during refueling outages. To demonstrate partial opening, flow will be provided in the forward direction by an outside pressure source. There is no accident flow rate associated with the valves' safety function in the open direction. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-02

System(s): Internal Containment Spray

Valve(s): CI-1003

Category(s): C   Code Class: 2

Function: This check valve is located in the caustic additive line from the caustic standpipe to the ICS pumps suction and serves as a Class 2 to non-Code boundary barrier. The valve performs an active safety function in the open direction to provide a flow path for sodium hydroxide (NaOH) to be directed to the ICS pump suction, subsequent to the upstream AOVs opening. The addition of NaOH to the spray stream is required for the removal of fission products released into the containment atmosphere following a LOCA. The removal of airborne radioactive iodine from the containment atmosphere minimizes the potential of a release of airborne radioactive iodine and subsequent off-site dose consequences. The addition of sodium hydroxide to the spray stream also serves to maintain the spray and sump within the environmental qualification pH band and prevents chloride induced stress corrosion cracking of stainless steel components by maintaining sump pH. This valve also performs an active safety function in the closed direction. It must be capable of closure on reversal of flow to prevent diversion of pump suction supply from the RWST to the caustic standpipe subsequent to depleting the NaOH. The RWST also serves as the suction supply source for emergency core cooling systems as well as ICS, a loss of inventory to the caustic standpipe, which is vented to atmosphere, could impact the safety function of other essential systems.

Deferred Test Justification: Partial or full stroke exercise of this valve in the forward direction requires the initiation of NaOH flow to the spray pump suction. This would result in mixing the containment spray piping and RWST with NaOH and ultimately into the RCS during refueling outages when the cavity is flooded. NaOH in the RCS could have the following potential adverse effects; 1) higher RCS activity and radiation levels in certain areas of the plant due to activation of the Na, 2) reduced CVCS demineralizer life, and 3) increased corrosion rates of RCS components.

Alternate Test Frequency: Full stroke capability of the valve will be verified during refueling outages by disassembly in accordance with the guidelines provided in Position 2 of GL 89-04. Disassembly is also recognized by OM-10, para. 4.3.2.4(c) as an acceptable alternative to flow exercising.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-03

System(s): Chemical and Volume Control

Valve(s): CVC-10

Category(s): AC Code Class: 2

Function: This normally open check valve is located in the charging header to the RCS loop B cold leg and auxiliary spray line. The valve performs an active safety function in the partially open direction to provide GL 96-06 thermal overpressure protection for containment penetration 12 if the penetration is isolated during post-LOCA or HELB conditions. CVC-10 opens to provide a relief path for excessive internal pressure to be relieved via CVC-14 and CVC-12. This valve also performs an active safety function in the closed direction. CVC-10 is designated as an inboard isolation valve for containment penetration 12, per USAR Table 5-2.2. As such, CVC-10 must be capable of closure on cessation or reversal of flow to maintain containment integrity. CVC-10 also receives Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: The only method available to verify reverse flow closure capability of this check valve is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the interruption of the valve's normal process functions in order to verify closure capability. Exercising this check valve in the reverse direction requires interrupting normal charging flow and the use of temporary test equipment inside containment. Such testing activities if performed during power operation could result in a plant trip or transient due to the interruption of normal charging flow. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4. This valve remains in the open position during power operation thereby, satisfying the partially open test requirement.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-04

System(s): Chemical and Volume Control

Valve(s): CVC-12

Category(s): C Code Class: 2

Function: This normally open check valve is located in the charging header to the RCS loop B cold leg. The valve performs an active safety function in the partially open direction to provide GL 96-06 thermal overpressure protection for containment penetration 12 if the penetration is isolated during post-LOCA or HELB conditions. CVC-12 opens to provide a relief path for excessive internal pressure to be relieved to the RCS. This valve performs an active safety function in the closed direction. CVC-12 is an ASME Class 1 to Class 2 RCS pressure boundary isolation valve as defined in 10CFR50.2. Therefore, the valve must be capable of closure to maintain the integrity of the RCS pressure boundary in the event of a failure of upstream piping or components

Deferred Test Justification: Verification of valve closure capability quarterly during power operation would require interrupting normal charging flow which could result in an undesirable pressurizer level transient and a potential plant trip. Additionally, there are no test connections located downstream of the valve to facilitate reverse exercising with an outside pressure source. The only practical means to verify valve closure capability is by non-intrusive testing or by demonstrating the ability to establish a differential pressure across the valve seat. Performing this type of test activity is preferred to be done during refueling outages due to the potential of delaying plant restart if performed during cold shutdown.

Partial Stroke Testing: Partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when sufficient time exists to utilize non-intrusive test equipment. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4. This valve remains in the open position during power operation thereby, satisfying the partially open test requirement.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-05

System(s):	Service Water			
Valve(s):	SW-1A1	SW-1A2	SW-1B1	SW-1B2
Category(s):	C	Code Class:	3	

Function: These normally open check valves are located in the discharge lines from the service water pumps. The valves perform an active safety function in the open direction. The valves are required to open upon the associated pump starting to provide a path for SW flow. The worst-case condition under which the SW system is required to function would be a LOCA/LOOP with a coincidental single active failure. Under these conditions, each service train is capable of supplying 100% of the required accident cooling flow to safety-related components. The check valve also performs an augmented function in the closed direction. The valves close on reversal or cessation of flow to prevent diversion of discharge flow from the inservice pumps through an idle or out-of-service pump in lieu of being properly directed to the SW headers. This is a concern only during power operation since during an accident train operability is dependent upon two pump operation and train separation.

Deferred Test Justification: Full stroke exercising these valves in the forward direction with maximum required accident flow quarterly during power operation is not practical due to the potential for equipment damage. In order to achieve required flow rates, the CCW heat exchangers would be exposed to full service water flow. Exposing the CCW heat exchangers to full service water flow results in thermal cycling and potential premature tube cracking. Additionally, full stroke exercising could upset the balance of heat removal from other plant systems. Single pump operation during cold shutdown could result in low header pressure resulting in less than adequate flow to existing heat loads. Also, during cooldown Tech Specs requires both SW trains to be operable to support RHR system operation for decay heat removal requirements. The potential consequences of full stroke exercising the SW pump discharge check valves are undesirable and impractical. The only practical means of verifying full stroke opening capability of these check valves is by disassembly or by nonintrusive methods. Performing this type of testing activity quarterly during power operation or during cold shutdowns is impractical without providing a commensurate increase in the level of valve reliability. Performing this type of test activity during cold shutdown is also impractical due to the use of temporary test equipment or component disassembly, which could delay plant restart.

Partial Stroke Testing: Partial stroke exercising will be performed during quarterly pump testing.

Alternate Test Frequency:

Full stroke capability of the valve will be verified on a nominal 18 month frequency not determined by refueling outages by valve disassembly and inspection in accordance with the guidelines provided in Position 2 of GL 89-04. The frequency for inspections is documented in Technical Position, TP- 07. As an alternative, full opening capability may be verified by non-intrusive methods. Exercising in the reverse direction is accomplished during quarterly pump testing.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-06

System(s): Chemical and Volume Control

Valve(s): CVC-205A CVC-205B
CVC-206A CVC-206B

Category(s): AC Code Class: 1

Function: These normally open check valves are located in the CVCS seal water injection line to the RCP shaft seals. The valves perform an active safety function in the partially open direction to provide GL 96-06 thermal overpressure protection for penetrations 13E and 13N. The valve must be capable of partial opening to prevent overpressurization of the containment penetration due to thermal expansion during post-LOCA or HELB conditions. These valves also perform an active safety function in the closed direction. They serve as ASME Class 1 RCS pressure boundary isolation valves as defined in 10CFR50.2. Therefore, the valve must be capable of closure to maintain the integrity of the RCS pressure boundary in the event of a failure of upstream piping and components. Additionally, the valves are designated as inboard isolation valves for containment penetrations 13N and 13E, per USAR Table 5-2.2. As such, they must be capable of closure on cessation or reversal of flow to maintain containment integrity.

Deferred Test Justification: The preferred method to verify reverse flow closure capability of these check valves is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the interruption of the valves' normal process functions in order to verify their closure capability. Exercising these check valves in the reverse direction requires interrupting normal RCP seal water flow and the use of temporary test equipment inside containment. Such testing activities if performed during power operation would result unnecessary wear to the seals and potential premature failure of the RCP shaft seals rendering the associated pump inoperable. An inoperable RCP would require the plant to be placed in hot shutdown, as TS 3.1.a.1.B requires both RCPs to be in operation when the reactor is in the operating mode. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown, if the RCPs are removed from service, is considered impractical due to the necessity of utilizing temporary test equipment inside containment.

Partial Stroke Testing: Partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Closure verification of these check valves shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of

test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Sections 3.1.1.4 and 4.1.4. These valves remain in the open position during power operation in support of normal seal water flow to the RCPs. Because the valves are normally open, and seal injection flows are indicated in the control room this verifies partial stroke capability.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-07

System(s): Control Room Air Conditioning
Service Water

Valve(s):

HS-2203A-1	HS-2203B-1	SW-1040A-1	SW-1040A-1
SW-1040B-1	SW-1040B-2	SW-1042A-1	SW-1042B-1

Category(s): B Code Class: 3

Function: These air-operated valves are located in the interface between the control room A/C chilled water and the service water system. Their normal position isolates service water and provides a flow path for closed loop chill water circulation through the control room air conditioning chillers primarily in support of personnel comfort in the control. These valves perform an active safety function and must be capable of changing position by a common remote manual switch to align service water to the control room air conditioning units as the safety related heat sink for the Control Room AC units.

Deferred Test Justification: Full stroke exercising these valves requires the removal of the associated control room air conditioning unit from service and the manipulation of manual valves to isolate the chilled water system from the service water system. This isolation prevents the potential for contamination of the potable water (PW) system with service water, since the PW system provides makeup to the chilled water system. Subsequent to valve exercising, portions of the chilled water system exposed to service water will require draining and flushing to prevent cross contamination of the chilled water system with the impurities from service water. Additionally, valve exercising requires more coordination than normal as a result of the valves actuating from a common remote manual switch. Due to the considerable effort associated with these activities, testing during power operation or cold shutdown is impractical without a compensating increase in the level of quality and safety.

Partial Stroke Testing: The valves control circuitry is not designed with partial stroke capability, even though partial-stroke exercising would require the same level of activity as full stroke exercising.

Alternate Test Frequency: Valve full stroke exercising shall be performed each refueling outage when conditions are more suitable to perform the required tests.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-08

System(s): Auxiliary Feedwater

Valve(s): MU-311A MU-311B MU-311C

Category(s): C Code Class: 3

Function: These check valves are located in the AFW pump suction supply lines from the CST. The valves have no safety function in the open direction. The CSTs are the initial suction supply source to the AFW pumps primarily due the higher quality of condensate water. However, the CSTs are non-seismic and are non-safety-related. Due to the CST being the initial suction supply source to the AFW pumps forward exercising of these checks shall be considered an augmented test requirement in the IST program and performed as good engineering judgement. These check valves perform an active safety function in the closed direction. Upon depletion of CST inventory or when the CSTs are unavailable, the suction supply for the AFW pumps is provided by the service water system. When the AFW pumps are aligned to the service water system for a suction supply source, these Class 3 to non-Code boundary barrier check valves close to prevent the service water supply from being diverted to the CST.

Deferred Test Justification: These check valves are not provided with downstream test connections or position indication. Flow exercising these valves in the reverse direction quarterly during power operation, during cold shutdowns and refueling outages is not practical. Flow exercising requires abnormal alignment of the AFW system by the manipulation of various manual valves and requires extensive flushing of the AFW system piping subsequent to closure of the service water supply valves. This activity is necessary to prevent contamination of CST inventory and also minimizes the potential for chemistry problems in the feedwater system. The intrusion of impure service water to the feedwater system could result in unnecessarily subjecting the steam generators to premature degradation due to inadequate feedwater chemistry. The potential consequences and the actions necessary to perform reverse exercising of the CST supply check valves are undesirable and impractical without a commensurate increase in the level of valve reliability. The only practical means of verifying closure capability of these check valves is by disassembly or by performing a radiographic examination test (RT) on the valve body to demonstrate the valve disk is in the closed position. Performing this type of testing activity quarterly during power operation or during cold shutdowns is impractical without providing a commensurate increase in the level of valve reliability. Performing this type of test activity during cold shutdown is also impractical due to the use of temporary test equipment or component disassembly and could delay plant restart.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Full stroke capability of the valve will be verified during refueling outages by disassembly in accordance with the guidelines provided in ISTC-4.5.4(c) of OMa-1996. As an alternative, closure capability may be verified by non-intrusive methods. Full stroke exercising in the forward direction is accomplished during quarterly pump testing.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-09

System: Reactor Coolant

Valve(s): PR-33A PR-33B
RC-45A RC-45B
RC-46 RC-49

Category: B Code Class: 1

Function: These normally closed pilot operated solenoid valves are part of the RC vent system. The valves associated with the RC vent system perform an active safety function in the open position. They must be capable of opening by remote manual switch actuation to vent non-condensible gases from the reactor vessel headspace and pressurizer during post-accident conditions. This function supports post accident recovery by allowing the removal of gases which could inhibit adequate core cooling during natural circulation and is a post-TMI modification.

Deferred Test Justification: Exercising these valves during power operation with subsequent failure to reclose or significant leakage following closure could result in a loss of coolant in excess of the limits imposed by T.S. 3.1.d leading to a plant shutdown. Additionally, as pilot operated solenoid valves they may not properly close if the upstream pressure is equal to or less than downstream pressure, which increases the potential for seat leakage. Exercise testing these valves during cold shutdowns has historically indicated that unexpected valve opening can occur. As one of the two valves in series can open, the associated valve has experienced burping and chattering. An unnecessary challenge to the system, during cold shutdown conditions, is not warranted.

Partial Stroke Testing: The control circuitry of the valves is not provided with partial stroke capability. In addition, partially exercising the valves would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Valve exercise testing will be performed during refueling outages. The RCS vent system valves are opened during each performance of the reactor coolant system fill and vent procedure. Local observation for position indication is not possible therefore, other indications shall be used to verify valve operation as allowed by the Code. Leak tightness is verified by RCS leakage monitoring per TS 3.1.d. Problems with remote position indication for these valves would be identified during these activities.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-10

System: Safety Injection

Valve(s): SI-12A SI-12B

Category: C Code Class: 1

Function: These check valves are located inside containment in the high head safety injection flow path to the RCS Loop A and B cold legs. The valves perform an active safety function in the open direction. The valves must be capable of opening subsequent to a SI system initiation to provide a path for post-LOCA high head safety injection and recirculation flow to the RCS for emergency and long term core cooling. Safety injection via the cold legs is also credited for mitigating the consequences for a main steam line break (MSLB). These valves perform a passive safety function in the closed direction. SI-12A&B serve as ASME Class 1 to Class 2 boundary barrier isolation valves. However, this safety function will be considered as passive since the valves remain in the closed position during normal reactor operation [re: 10 CFR 50.55a(c)(2)(i)].

Deferred Test Justification: Full or partial stroke exercising these valves in the forward direction quarterly during power operation is not possible due to insufficient SI pump discharge head to overcome reactor pressure. Full or partial stroke exercising these valves in the forward direction during cold shutdown is precluded by restrictions related to LTOP concerns per TS 3.1.b.4.

Partial Stroke Testing: Partial stroke exercising is precluded by the same restrictions preventing full stroke exercising.

Alternate Test Frequency: Full stroke exercising in the forward direction shall be performed during refueling outages when sufficient expansion volume exists in the RCS to accommodate the required flow rate.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-11

System: Safety Injection

Valve(s): SI-13A SI-13B

Category: C Code Class: 1

Function: These check valves are located inside containment in the high head safety injection flow path to the RCS Loop A and B cold legs. The valves perform an active safety function in the open direction. The valves must be capable of opening subsequent to a SI system initiation to provide a path for post-LOCA high head safety injection and recirculation flow to the RCS for emergency and long term core cooling. Safety injection via the cold legs is also credited for mitigating the consequences for a main steam line break (MSLB). These valves also perform an active safety function in the closed direction. SI-13A&B are designated as containment isolation valves for containment penetration 28N, per USAR Table 5.2-2. SI-13A&B must be capable of closure on reversal or cessation of flow to maintain containment integrity subsequent to SI train removal from service during post-LOCA cooldown and depressurization. SI-13A&B also serve as ASME Class 1 to Class 2 boundary barrier isolation valves. However, this safety function will be considered as passive since the valve remains in the closed position during normal reactor operation [re: 10 CFR 50.55a(c)(2)(i)].

Deferred Test Justification: Full or partial stroke exercising these valves in the forward direction quarterly during power operation is not possible due to insufficient SI pump discharge head to overcome reactor pressure. Full or partial stroke exercising these valves in the forward direction during cold shutdown is precluded by restrictions related to LTOP concerns per TS 3.1.b.4.

Partial Stroke Testing: Partial stroke exercising is precluded by the same restrictions preventing full stroke exercising.

Alternate Test Frequency: Full stroke exercising in the forward direction shall be performed during refueling outages when sufficient expansion volume exists in the RCS to accommodate the required flow rate. Reverse exercising shall be performed at refueling by performing a seat leakage test. Test deferral to refueling outages for verifying closure capability is allowed per NUREG-1482, Section 4.1.4.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-12

System(s): Safety Injection

Valve(s): SI-206A SI-206B

Category(s): C Code Class: 2

Function: These check valves are located in the minimum flow recirculation line for the SI pumps. The valves perform an active safety function in the open direction to provide a minimum flow recirculation path to the RWST. Opening capability of SI-206A&B prevents damage to the pump as a result of operating in low flow or deadheaded conditions. The SI pumps mitigate the effects of relatively small break LOCAs which are indicative of slow depressurization of the RCS. These check valves also perform an active safety function in the closed direction. During the recirculation phase of safety injection reverse leakage through either SI-206A&B into an idle SI pump could result in sump inventory communicating with the RWST when the adjacent train is in operation.

Deferred Test Justification: Flow exercising these valves in the reverse direction quarterly during power operation is not practical as both trains of Safety Injection would require removal from service. These normally closed valves are not provided with position indication. The only method available to verify reverse flow closure capability is by seat leakage testing. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment.

Partial Stroke Testing: These valves are partially stroked in the reverse direction during quarterly pump testing. However, closure is not quantified except by a satisfactory pump test.

Alternate Test Frequency: Closure verification of these check valves shall be accomplished during refueling outages by performing seat leakage testing. These valves are full stroked in the forward direction during quarterly pump testing.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-13

System(s): Safety Injection

Valve(s): SI-6A SI-6B

Category(s): C Code Class: 2

Function: These check valves are located in the discharge lines from SI pumps to the cold leg loop A & B injection lines and reactor vessel injection lines. The valves perform an active safety function in the open position to provide a path for post-accident high head safety injection and sump recirculation flow to the RCS for emergency core cooling. This function is required to mitigate the consequences of a LOCA and to maintain shutdown margins subsequent to a MSLB and SGTR. The valves also perform an active safety function in the closed direction. The SI trains are normally aligned to maintain 100% redundancy with reliance on the pump discharge headers being cross-tied. In this normal alignment configuration, failure of an SI pump discharge check valve to close, subsequent to a train failure, or removal from service, could compromise the ability of the operating train to accomplish its design safety function. Additionally, valve closure on the non-operating train during recirculation provides an additional boundary barrier to prevent sump inventory from communicating with the RWST.

Deferred Test Justification: The high head safety injection pumps are not provided with full flow test capability. Quarterly pump testing is performed by establishing flow via the minimum flow recirculation lines which branch off upstream of the pump discharge check valves. Full stroke exercising is not possible during power operation due to insufficient SI pump discharge head to overcome reactor pressure. Partial stroke exercising during power operation is not possible due to the inability to establish flow through the valves during quarterly pump testing. Full or partial stroke exercising these valves in the forward direction during cold shutdown is precluded by restrictions related to LTOP concerns per TS 3.1.b.4 and insufficient expansion volume in the RCS to accommodate flow. Exercising these valves in the reverse direction quarterly during the inservice testing of the adjacent pump would render both trains of SI inoperable and create the potential of overpressurizing the suction piping of the non-operating pump.

Partial Stroke Testing: Partial stroke exercising is not possible for the same reason as the inability to full stroke exercising.

Alternate Test Frequency: The valves shall be full stroke exercised in the forward direction during refueling when sufficient expansion volume exists in the RCS to accept flow. The valves will be exercised in the reverse direction during refueling when both pumps can

be removed from service with no impact on safety. Closure capability shall be verified by utilizing an outside pressure source and performing a seat leakage test. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-14

System(s): Service Water

Valve(s): SW-501A SW-501B

Category(s): C Code Class: 3

Function: These check valves are located in the supply lines from service water headers "A" and "B" to the suction of the turbine driven AFW pump. The valves perform an active safety function in the open position to provide a flow path from the service water headers to the TDAFW pump suction when CSTs inventory is depleted or unavailable. This function ensures continuous long-term makeup supply to the steam generators during various design bases accidents. These check valves also perform an active safety function in the closed direction for train separation. This function prevents the diversion of service water flow from "B" train to an idle or unavailable "A" train, or vice versa, in lieu of the pump suction.

Deferred Test Justification: Exercising this valve to the full open position quarterly during power operation or during cold shutdown would require the injection of SW into the feedwater system and ultimately the steam generators. This would upset the chemistry balance maintained in the steam generators possibly resulting in premature degradation.

Partial Stroke Testing: Partial stroke exercising is performed quarterly during the pump test by allowing SW flow through the valves while discharging to a trench via a downstream drain.

Alternate Test Frequency: Full stroke capability of the valves will be verified during refueling outages by sample disassembly in accordance with the guidelines provided in Position 2 of GL 89-04. The valves will be partially stroked subsequent to reassembly.

REFUELING OUTAGE TEST JUSTIFICATION - ROJ-15

System: Safety Injection

Valve(s): SI-301A SI-301B

Category: C Code Class: 2

Function: These check valves are located in the individual supply lines from the RWST to the suction of RHR pumps. The valves perform an active safety function in the open direction. They must be capable of opening subsequent to an auto pump start to provide a flow path for borated water from the RWST to the suction of the RHR pumps. This function is required for initiation of low head safety injection flow for emergency core cooling following a large break LOCA. The valves perform no safety function in the closed direction. SI-301A&B close on reversal of flow to prevent diversion of flow to the RWST when RHR is operating in the shutdown cooling mode or sump recirculation mode of safety injection. The ability for SI-301A&B to close under these conditions is not required for accident mitigation or to achieve/maintain the plant in a safe shutdown condition. Upstream motor operated valves SI-300A&B provides adequate isolation to prevent diversion of flow to the RWST.

Deferred Test Justification: During quarterly pump testing suction supply is provided from the RWST and utilizes the ICS piping as a recirculation flow path back to the RWST. However, the minimum required accident flow is unable to be achieved via this test circuit. Full stroke exercising these valves in the forward direction during power operation would require aligning the RHR pump discharge to the RCS loop B cold leg. The RHR pumps have insufficient discharge head to overcome RCS pressure. Full stroke exercising these valves in the forward direction during cold shutdown is precluded by restrictions related to LTOP concerns per TS 3.1.b.4 and insufficient expansion volume in the RCS to accommodate flow. Testing will be performed during refuelings, when RHR is utilized to flood the refueling cavity and higher flow rates can be achieved.

Quarterly Partial Stroke Testing: These check valves shall be exercised in the partially open direction during quarterly pump testing.

Alternate Test Frequency: Full stroke exercise tests in the forward and reverse directions shall be performed during refueling when RHR is utilized to fill the refueling cavity.

APPENDIX E

TECHNICAL JUSTIFICATIONS

TJ-01	AS-33
TJ-02	CI-1001A, -1001B
TJ-03	CVC-211-2
TJ-04	CVC-55
TJ-05	IA-102, -103
TJ-06	SA-7000A, -7000B, -7001A, -7001B
TJ-07	SA-7002A, -7002B, -7004A, -7004B
TJ-08	MD(R)-324
TJ-09	MS-1A-1, -1B-1
TJ-10	MU-1011
TJ-11	NG-107-1, -304
TJ-12	SA-2001A-P, -2001B-P
TJ-13	FW-10A, -10B
TJ-14	FW-7A, -7B
TJ-15	RBV-1, -2, -3, -4
TJ-16	RHR-3A, -3B

TECHNICAL JUSTIFICATION - TJ-01

System: Radiation Monitoring

Valve(s): AS-33

Category: AC Code Class: NCC

Function: This non-Code class rad monitor return check valve is located inside containment in the return line to containment from radiation monitors R-11 and R-12. Per USAR Table 5.2-2, the valve is designated as an inboard containment isolation valve and as such, must be capable of closure on reversal of flow to maintain containment integrity. The valve has no safety function in the open position. AS-33 opens to provide a return path to containment during normal leak detection sampling activities.

Deferred Test Justification: This check valve provides a discharge path directly to the containment atmosphere from radiation monitors R-11 and R-12 and is not provided with position indication. The only method available to verify reverse flow closure capability is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the interruption of the valve's normal process function in order to verify its closure capability. Exercising this check valve in the reverse direction requires the use of temporary test equipment inside containment. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since this valve is not ASME Code Class 1, 2, or 3 it is outside the scope of 10 CFR 50.55a therefore, this testing will be considered as Augmented.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-02

System: Internal Containment Spray (Chemical Injection)

Valve(s): CI-1001A CI-1001B

Category: B Code Class: NCC

Function: These normally closed air operated valves are located between the caustic additive standpipe and the containment spray pumps' suction piping. The valves perform an active function important to safety in the open position to provide a flow path for sodium hydroxide (NaOH) to the ICS pump suction. This function allows the addition of NaOH to the spray stream for the removal of fission products released into the containment atmosphere during a LOCA. The removal of airborne radioactive iodine from the containment atmosphere and placing it in suspension in the sump inventory minimizes the potential of a release of airborne radioactive iodine and subsequent off-site dose consequences. The addition of sodium hydroxide to the spray stream also serves to maintain the spray and sump within the environmental qualification pH band and prevents chloride induced stress corrosion cracking of stainless steel components by maintaining sump pH.

Deferred Test Justification: Exercising these valves requires the sodium hydroxide (NaOH) supply to the pump suction be manually isolated to prevent mixing of the containment spray piping and RWST with NaOH and ultimately into the RCS during refueling outages when the cavity is flooded. NaOH in the RCS could have the following potential adverse effects; 1) higher RCS activity and radiation levels in certain areas of the plant due to activation of the Na, 2) reduced CVCS demineralizer life, and 3) increased corrosion rates of RCS components. Exercising these valves during refueling in conjunction with the disassembly of downstream check valve CI-1003 will minimize the potential for intrusion of NaOH into the RCS. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.

Partial Stroke Testing: Partially exercising the valves would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Full stroke exercising shall be performed during refueling outages in conjunction with disassembly of the downstream check valve.

TECHNICAL JUSTIFICATION - TJ-03

System: Chemical and Volume Control

Valve(s): CVC-211-2

Category: AC Code Class: NCC

Function: This non-Code class check valve is located inside containment in the bypass line around the seal return header isolation valve CVC-211. The valve performs an active function important to safety in the partial open and closed directions. CVC-211-2 must be capable of partially opening to provide thermal overpressure protection for containment penetration 14 when the penetration isolation valves are closed. The valve also performs an active function important to safety in the closed direction as a designated containment isolation valve. CVC-211-2 must be capable of closure on cessation or reversal of flow to maintain containment integrity.

Deferred Test Justification: Exercising this valve partially open or in the reverse direction requires interrupting normal seal cooling return flow from the RCPs. To satisfactorily exercise this check valve requires the use of temporary test equipment inside containment to perform a leak test or back flow test, in addition to passing flow through the valve to demonstrate their partial opening capability. Such testing activities, if performed during power operation, could potentially cause unnecessary accelerated wear to the seals and possible seal failure. Due to the considerable effort associated with these test activities, exercise testing to the partially open or closed positions during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since this valve is not ASME Code Class 1, 2, or 3 it is outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented.**

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of these check valves shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. To demonstrate partial opening, flow will be provided in the forward direction by an outside pressure source. Check valve exercising shall be performed during refueling outages or during cold shutdowns of an extended duration when both RCPs can be removed from service. The

deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Sections 3.1.1.4 and 4.1.4.

TECHNICAL JUSTIFICATION - TJ-04

System: Misc. Drains and Sumps

Valve(s): CVC-55

Category: AC Code Class: NCC

Function: This normally closed non-Code class check valve is located in the volume control tank (VCT) gas vent header to the containment. The valve has no function important to safety in the open position. The VCT normal vent is to the waste disposal system. During post-accident conditions the VCT vent path is aligned to the containment. This allows gaseous fission products stripped from the reactor coolant and displaced by VCT inflow to be transferred from the auxiliary building to the containment vessel, which minimizes radiation levels in the auxiliary building. The ability to displace gaseous fission products is not required for accident mitigation or to achieve/maintain the plant in a safe shutdown condition. This valve performs an active function important to safety in the closed position. CVC-55 is designated as an inboard containment isolation valve for penetration no 44L, per USAR Table 5.2-2. As a containment isolation valve, CVC-55 must be capable of closure, if open, on cessation of flow to maintain containment integrity. The valve receives Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: This check valve provides a discharge path directly to the containment atmosphere from the VCT and is not provided with position indication. The only method available to verify reverse flow closure capability is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the use of temporary test equipment inside containment in order to verify its closure capability. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since this valve is not ASME Code Class 1, 2, or 3 it is outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented.**

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-05

System: Instrument Air

Valve(s): IA-102 IA-103

Category: AC Code Class: NCC

Function: These non-Code class check valves are located in the instrument air header supplying containment. The valves perform an active function important to safety in the closed direction. They are designated as containment isolation valves for containment penetration no. 20 per USAR Table 5.2-2. As such, the valves must be capable of closure on cessation or reversal of flow to maintain containment integrity. The valves will also receive Type C seat leakage testing per the requirements of Appendix J. The valves have no function important to safety in the open position. They remain open during normal operation to provide a path for instrument air to be supplied to components inside containment which are dependent upon instrument air for accomplishing their process function.

Deferred Test Justification: These normally open check valves provide an instrument air supply path to components located inside containment and are not provided with position indication. The only method available to verify reverse flow closure capability is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry, isolation of instrument air to containment and venting the supply header to verify their closure capability. Isolating instrument air to containment would result in the loss of various process functions required to support normal plant operation including charging and letdown. Such testing activities if performed during power operation could result in a plant trip or transient due to the interruption of normal charging and letdown flow. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as Augmented

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-06

System: Reactor Building Ventilation

Valve(s): SA-7000A SA-7000B SA-7001A SA-7001B

Category: B Code Class: NCC

Function: These non-Code Class manual isolation valves are required to change position in order to accomplish a function important to safety as defined within the scope of the ASME OM Code. Valve function is associated with post-LOCA hydrogen dilution inside containment.

Deferred Test Justification: The manual valves for which the proposed alternate test frequency applies are exposed to air and are maintained in the closed position during power operation. They are located in environments where temperatures and service media will have no adverse affect on valve operability. Due to the simplicity of manual valve design, and the limited number of failure mechanisms it is KNPPs position that exercising manual isolation valves more frequently than once every 2 years will not compromise quality or safety. The proposed alternate test frequency specifies an exercise interval for manual valves consistent with the time period for general experience with the operation of plant equipment over a refueling cycle. The manual valves that apply to this justification for deferral of testing are located outside the ASME Class 1, 2, and 3 boundaries therefore outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented.**

Partial Stroke Testing: Partial stroke exercising will not be performed for the same reason as full stroke exercising.

Alternate Test: KNPP proposes to full-stroke exercise manual valves at least once every 2 years, in lieu of the exercise interval of 3 months specified in OMa-1988, Part 10.

TECHNICAL JUSTIFICATION - TJ-07

System: Reactor Building Ventilation

Valve(s): SA-7002A SA-7002B SA-7004A SA-7004B

Category: AC (7004A&B) Code Class: NCC
C (7002A&B)

Function: These normally closed check valves are located in the non-Code class emergency air supply lines to containment. As part of the post-LOCA hydrogen control subsystem, the valves performs an active function important to safety in the open position to provide a flow path for emergency air supply to containment for hydrogen dilution. SA-7004A&B also perform an active function important to safety in the closed direction. These valves are designated as containment isolation valves for penetration nos. 36NW and 36SE per USAR Table 5.2-2. As containment isolation valves, SA-7004A&B must be capable of closure on cessation or reversal of flow to maintain containment integrity. The valves shall be subject to Type C leakage testing to ensure leak tightness. SA-7002A&B perform no function important to safety in the closed position. SA-7002A&B would close to ensure containment air H2 analyzer sample return flow is directed to containment.

Deferred Test Justification: Exercising these valves in the forward direction requires opening the containment isolation valves associated with penetrations 36NW and 36SE and aligning instrument air to containment via the emergency air supply lines. During normal power operation these valves are not exposed to any conditions that would contribute to valve degradation. Aligning instrument air for the purpose of valve exercising could result in challenging containment integrity, as both containment isolation valves would be simultaneously in the open position. Forward exercising these during refueling outages prior to performing Type C seat leakage testing would provide a higher degree of confidence that the containment boundary is maintained. Reverse exercising of SA-7004A&B shall be performed in conjunction with Type C leakage testing during refueling due to the necessity of utilizing temporary test equipment inside containment. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of these check valves SA-7004A&B shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4. To demonstrate opening capability, flow will be provided by the instrument air system during refueling outages prior to the performance of J Type C seat leakage testing.

TECHNICAL JUSTIFICATION - TJ-08

System: Miscellaneous. Drains and Sumps

Valve(s): MD(R)-324

Category: AC Code Class: NCC

Function: This normally closed check valve is located in the non-Code class deareated drain tank emergency pumps discharge to the containment sump "A". The valve has an active function important to safety in the partially open position to provide thermal overpressure protection to containment penetration piping for penetration no. 49E. KNPPs response to Generic Letter 96-06 credited the ability of MD(R)-324 to provide a relief path for a thermally induced overpressure condition. This valve performs an active function important to safety in the closed position. Per USAR Table 5.2-2, MD(R)-324 is designated as the inboard containment isolation valve for penetration no 49E. As a containment isolation valve, MD(R)-324 must be capable of closure, if open, on cessation of flow to maintain containment integrity. The valve receives Type C seat leakage testing per the requirements of Appendix J.

Deferred Test Justification: This check valve provides a discharge path directly to containment sump "A" and is not provided with position indication. The only method available to verify reverse flow closure capability is by seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the use of temporary test equipment to verify its closure capability. Due to the considerable effort associated with these test activities, reverse exercise testing during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since this valve is not ASME Code Class 1, 2, or 3 it is outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented.**

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-09

System:	Main Steam	
Valve(s):	MS-1A-1	MS-1B-1
Category:	C	Code Class: NCC

Function: These MS non-return check valves are located in non-Code class piping immediately downstream of the MSIVs. The valves perform an active function important to safety in the closed direction. A steam line rupture upstream of the MSIV assembly would require valve closure to prevent unrestricted blowdown of the unaffected steam generator during the unlikely event of the MSIVs failure to close (USAR 14.2.5). These valves have no safety function in the open direction. MS-1A-1 and -1B-1 remain open during normal operation to allow steam flow from steam generators to the main turbine in support of power generation. This function is not required for accident mitigation and is not a safety-related function.

Deferred Test Justification: Exercising these valves in the closed direction during normal operation would require isolation of one line of steam flow to the turbine. Isolation of a main steam header would cause a severe pressure transient in the associated main steam line possibly resulting in a plant trip. Additionally, isolation of a main steam header at power could potentially result in challenging the setpoint of the main steam relief valves causing inadvertent lifting. Reducing power level to perform testing without causing a transient would significantly impact plant operations and power production. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: The valve disk will be verified to be in the closed position, during refueling outages, by non-intrusive methods or disassembly.

TECHNICAL JUSTIFICATION - TJ-10

System: Reactor Coolant

Valve(s): MU-1011

Category: AC Code Class: NCC

Function: This check valve is located in the non-Code class reactor makeup water supply line to the pressurizer relief tank and the RCP standpipe. The valve performs an active function important to safety in the closed direction. MU-1011 is designated as an inboard isolation valve for containment penetration 45, per USAR Table 5.2.2. As such, MU-1011 must be capable of closure on cessation or reversal of flow to maintain containment integrity. MU-1011 will also receive Type C seat leakage testing per the requirements of Appendix J. This valve has no function important to safety in the open direction. MU-1011 performs the process function in the forward direction to provide a path for RMW flow to the spray nozzles in the PRT and the RCP standpipe.

Deferred Test Justification: This check valve is located inside containment and is not provided with position indication. The only method available to verify reverse flow closure capability of this check valve is during the performance of seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry, the interruption of the valve's normal process functions and the use of temporary test equipment in order to verify its closure capability. As a result of the considerable effort associated with these test activities, reverse exercise testing quarterly or during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since this valve is not ASME Code Class 1, 2, or 3 it is outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test Frequency: Closure verification of this check valve shall be performed during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-11

System:	Safety Injection Reactor Coolant
Valve(s):	NG-107-1 NG-304
Category:	AC Code Class: NCC
Function:	These check valves are located inside containment in the non-Code class nitrogen supply headers to the SI accumulators and PRT. The valves have no function important to safety in the open direction. Opening of these valves to provide a flow path for nitrogen makeup to the SI accumulators and PRT is not a safety function. These valves perform an active function important to safety in the closed direction. They are designated inboard isolation valves for containment penetrations 31 and 2, per USAR Table 5.2-2. As such, the valves must be capable of closure on reversal of flow to maintain containment integrity. Both valves receive Type C seat leakage testing per the requirements of 10CFR50 Appendix J.
Deferred Test Justification:	These check valves are located inside containment and are not provided with position indication. The only method available to verify reverse flow closure capability of these check valves is during the performance of seat leakage testing. The test connections utilized to perform seat leakage testing are located inside containment. Therefore, it would require containment entry and the use of temporary test equipment in order to verify their closure capability. As a result of the considerable effort associated with these test activities, reverse exercise testing quarterly or during cold shutdown is considered impractical due to the necessity of utilizing temporary test equipment inside containment. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.
Partial Stroke Testing:	Partial stroke exercising would require the same activities as full stroke exercising.
Alternate Test Frequency:	Closure verification of these check valves shall be accomplished during refueling outages when performing Appendix J Type C seat leakage testing. The deferral of test frequency to refueling outages is acceptable per the discussion provided in NUREG-1482, Section 4.1.4.

TECHNICAL JUSTIFICATION - TJ-12

System: Diesel Generator Mechanical

Valve(s): SA-2001A-P SA-2001B-P

Category: C Code Class: NCC

Function: These check valves are located in the non-Code class outlet line from the respective train diesel generator start-up air compressor to primary air receiver bank. The valves perform an active function important to safety in the closed direction to prevent a loss of primary air receiver inventory subsequent to a postulated loss of the upstream non-safety related air compressor or associated piping. These valves are included in the IST program scope as **Augmented** components.

Deferred Test Justification: Exercising these valves in the reverse direction would require installation of temporary test equipment in addition to the intentional depressurization of the start-up air compressor supply piping.

Monthly diesel generator start-up air system leakage tests are performed to verify adequate primary receiver capacity. During diesel generator operation primary receiver air pressure is recorded on an hourly frequency. These related component checks provide assurance of diesel generator air start system integrity. Additional testing of these valves in the closed direction using temporary test equipment on a quarterly frequency is considered to be impractical without providing a commensurate increase in the level of quality and safety.

Partial Stroke Testing: Partial stroke exercising would require the same activities as full stroke exercising.

Alternate Test: Operability of these check valves will be verified by disassembly each refueling outage. This alternative test method is identified in OM-10, paragraph 4.3.2.4. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore; this testing will be considered as **Augmented.**

TECHNICAL JUSTIFICATION - TJ-13

System: Feedwater

Valve(s): FW-10A FW-10B

Category: B Code Class: NCC

Function: These normally closed air operated valves are located in the non-Code class bypass lines around the Main FW Control Station control valves. The bypass valves perform an active function important to safety in the closed position to isolate feedwater flow during a MSLB. Isolating feedwater flow subsequent to a MSLB decreases the blowdown rate from the steam line break, which reduces cooling of the primary system and reduces the post-accident containment pressure by limiting the energy mass release to containment. FW-10A&B are capable of automatic closure upon receipt of a feedwater line isolation signal. The bypass valves perform no safety function in the open position. They modulate to control the flow of feedwater to the steam generators during startup and low-load operation.

Deferred Test Justification: Full stroke exercising the feedwater control bypass valves during power operation could induce perturbations in normal feedwater flow possibly resulting in undesirable fluctuations in steam generator level. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**.

Partial Stroke Testing: Partial stroke exercising will be performed during startups through normal operation of the valves in their modulating capacity.

Alternate Test Frequency: Full stroke exercise testing will be performed during cold shutdown conditions when feedwater is removed from service.

TECHNICAL JUSTIFICATION - TJ-14

System:	Feedwater		
Valve(s):	FW-7A	FW-7B	
Category:	B	Code Class:	NCC

Function:

These normally open air operated valves are located in the non-Code class main feedwater supply headers to the steam generators and serve as the feedwater flow control valves. The valves perform an active function important to safety in the closed position to isolate feedwater flow during a MSLB. Isolating feedwater flow subsequent to a MSLB decreases the blowdown rate from the steam line break, which reduces cooling of the primary system and reduces the post-accident containment pressure by limiting the energy mass release to containment. FW-7A&B auto close upon receipt of a feedwater line isolation signal. The valves perform no safety function in the OPEN position. During normal operation, the feedwater control valves modulate to control the flow of feedwater to the steam generator in response to input provided from the steam generator feedwater control system.

Deferred Test Justification:

Exercising the feedwater flow control valves closed quarterly during power operation would result in a loss of normal feedwater flow to the associated Steam Generator. Isolation of normal feedwater flow during power operation could potentially cause a severe steam generator level transient which could result in a plant trip, and could initiate an auxiliary feedwater system actuation signal unnecessarily. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented.**

Partial Stroke Testing:

Partial stroke exercising will be performed through normal operation of the valves in their modulating capacity.

Alternate Test Frequency:

Full stroke exercise testing will be performed during cold shutdown conditions when feedwater is removed from service.

TECHNICAL JUSTIFICATION - TJ-15

System: HVAC

Valve(s): RBV-1 RBV-2
RBV-3 RBV-4

Category: A Code Class: NCC

Function: These normally sealed closed air operated valves are located in the non-Code class high volume purge supply and exhaust lines ultimately to and from the outside atmosphere. These valves are designated as isolation valves for containment penetration 25S and 25N, per USAR Table 5.2-2. However, the containment purge supply and exhaust valves are required to be sealed closed when the reactor is critical, per TS 4.4.f.1, since they have not been demonstrated capable of closing from the full open position during a LOCA. The valves perform an active function important to safety in the closed position when open during cold shutdown or refueling outages. The valves are designed for rapid automatic closure, to limit a radioactivity release to the atmosphere, upon receipt of a containment ventilation isolation (CVI) signal. The valves shall be subject to Type C leakage testing to ensure leak tightness. These valves have no safety significant function in the open position.

Deferred Test Justification: The containment purge valves are required to be maintained in the locked closed during plant operations, per TS 4.4.f.1. This administrative control is necessary since the valves have not been demonstrated capable of closing from the full open position during a LOCA. Maintaining these valves locked closed during plant operation ensures that excessive quantities of radioactive materials will not be released via the containment purge system in the event of a design basis LOCA. These valves are passive during normal operation and no testing is required. When opened during cold shutdowns or refuel outages the valves are active and testing will be performed. Since these valves are not ASME Code Class 1, 2, or 3 they are outside the scope of 10 CFR 50.55a therefore, this testing will be considered as **Augmented**

Quarterly Partial Stroke Testing: The valve control circuitry is not provided with partial stroke capability. In addition, the valves are administratively maintained in the locked closed position.

Alternate Test Frequency: Exercise testing during cold shutdowns when these valves are opened. If not opened during cold shutdown, testing of these valves will be performed during refueling outages.

TECHNICAL JUSTIFICATION - TJ-16

System: Residual Heat Removal

Valve(s): RHR-3A RHR-3B

Category: C Code Class: 2

Function: These normally closed check valves are located in the RHR normal shutdown cooling supply lines to the suction of RHR pumps. These valves perform an active **Augmented** function important to safety in the open direction. RHR-3A&B open when the RHR system is aligned for the normal shutdown cooling mode of operation. Utilizing the normal shutdown cooling mode of RHR to achieve cold shutdown is not required for accident mitigation or to achieve/maintain a safe shutdown condition as KNPP is licensed as hot shutdown being safe shutdown. Achieving cold shutdown is however considered a risk significant function and components supporting this function shall be subject to augmented testing. These valves have no safety function in the closed direction. Diversion of flow is prevented through an idle pump when the A and B trains are cross-tied by the pump discharge check valves.

Deferred Test Justification: Quarterly pump testing utilizes the RWST as a suction supply source and ICS as a return flow path to the RWST, which does not expose these check valves to flow. Exercising these valves in the forward direction would require aligning the RHR pump suction to the RCS loop A or B hot leg. To open the upstream pressure isolation valves would require defeating an interlock and protective measures intended to protect the RHR system piping and components from overpressurization from the RCS. This low pressure line can not be exposed to reactor coolant pressures. In addition, the RHR pumps have insufficient discharge head to overcome RCS pressure. During cold shutdown, testing will be performed with RHR operating in the shutdown cooling mode. This mode of operation crossties the two trains both upstream and downstream of the heat exchangers. Due to the flow indicating device being located at the main shutdown cooling return header, individual flow through each check valve cannot be determined when both pumps are operating during RHR shutdown cooling. These check valves are included in the IST program as **Augmented** components and exercised in the forward direction as good engineering judgement due to their risk significant function.

Quarterly Partial Stroke Testing: Quarterly partial stroke exercising would result in the same consequences as full stroke exercising.

Alternate Test Frequency: Exercise testing to the open position shall be performed during cold shutdowns when RHR is aligned for shutdown cooling with single pump operation.

APPENDIX F

TECHNICAL POSITIONS

TP-01	FPC-11A, -11B
TP-02	AOVs/SOV used for Overpressure Protection
TP-03	Multiple Valve Actuation from a Common Switch
TP-04	Diesel Fuel Oil Transfer Pump Testing
TP-05	On-line Packing Adjustment to FW Regulating and Bypass Valves
TP-06	Exercise Frequency for Manual Valves
TP-07	Service Water Pump Discharge Check Valve Test Frequency

TECHNICAL POSITION - TP-01

System: Spent Fuel Pool Cooling

Valve(s): FPC-11A FPC-11B

Category: C

Code Class: 3

Function: These normally open parallel check valves are located in the cooling water supply lines to the spent fuel pools. The valves perform an active safety function in the open direction to allow the passage of emergency makeup to the spent fuel pools from service water. Service water serves as the safety related, seismic class I emergency makeup supply source to the spent fuel pools. These valves have no safety function in the closed direction. By design, the valves are intended to prevent a loss of pool inventory due to siphoning action subsequent to a line failure upstream. The return lines terminate sufficient distance above the fuel assemblies to ensure adequate shielding. In addition, the return lines are equipped with siphon breakers in the form of a hole in the pipe.

Technical Position: The required safety functions associated with the spent fuel pool which must be considered include; the spent fuel assemblies must be cooled and must remain covered with water during all storage conditions (SRP 9.1.3.I). Upon a loss of normal spent fuel pool heat removal capability during worst case heat loads, the heat absorption capacity of the pool maintains temperature at a safe limit with boiling occurring in 8.3 hours and a maximum boil-off-rate of 41 gpm (NRC SER for Amendment No. 150, January 23, 2001). Emergency makeup to replace boil off is provided by the service water system which is the qualified safety-related makeup supply source. It should be noted that utilizing service water as an emergency makeup supply source to the pools would be necessary only during the unlikely event of a loss of forced cooling to the pools with a complete core offload and the inability to restore forced cooling for 48.5 hours from various alternate supply sources. This amount of time is the minimum time-to-minimum shielding depth (10 feet above the racks) assuming a boil-off rate of 41gpm. Service water has the capability to be aligned to the pools as an emergency safety related supply source with a makeup capacity of 1000 gpm. Check valves FPC-11A and FPC-11B are located in parallel lines downstream of the emergency service water supply connection. Therefore, these check valves must be capable of opening to provide a flow path for emergency service water makeup to the pools subsequent to a loss of inventory.

IST guidelines for accomplishing full-stroke forward exercising of check valves require passing maximum accident flow through the valve. Forward exercising of parallel check valves requires flow through each valve to be a known value. These check valves remain in the open position during all operating modes as long as there are spent fuel rods in the pools. During single SFP pump operation approximately 450 gpm of combined flow passes through the check valves to spent fuel pools 1A and 1B, which are connected;

whereas, flow through either line communicates with both pools. Due to the pools being connected, emergency service water supply can be provided to both spent fuel pools through either check valve. The minimum required emergency makeup accident flow is 41 gpm with a maximum availability of 1000 gpm. The normal residual heat removal combined flow rate is approximately 450 gpm, which greatly exceeds the minimum required flow rate of 41 gpm. It is KNPPs position that these valves can be considered as in regular use in support of normal fuel pool cooling. No further testing will be performed as allowed by OM-10, para. 4.2.1.5.

TECHNICAL POSITION - TP-02

System:	Reactor Coolant			
Valve(s):	MU-1010-1	RC-422	RC-507	RC-508
	MD(R)-134	MD(R)-135	BT-32A	BT-32B
Category:	A	B (BT-32A&B)		
Code Class:	NCC	1 (RC-422)	2 (BT-32A&B)	

Function:

These normally closed air operated and pilot operated solenoid valves perform an active function in the partially open position to provide a relief path during a thermally induced overpressure condition of containment penetration piping post-LOCA. An increase in pressure due to thermal expansion results in pressure accumulation under the valve disk causing the valve to partially open providing a pressure relief path. These valves also perform an active function in the closed position as a containment isolation valves.

Technical Position:

KNPP response to NRC Generic Letter 96-06 stated that these valves provide overpressure protection for piping associated with various containment penetrations. This overpressure protection capability provides a relief path during a thermally induced overpressure condition of the containment penetration post-LOCA. For air operated valves, the actuator spring set allows the valve to partially open when sufficient pressure has accumulated under the valve seat. Likewise for solenoid operated valves, pressure accumulation under the pilot disk allows the pilot to open. Although these valves serve as overpressure protection devices, the requirements of Part 1 of the OM Code are not applicable. The OM Code does not provide guidance or specific requirements pertaining to the testing of air operated or piloted operated solenoid valves that serve an overpressure protection function. The lifting capability of the valve is a determination of the amount of pressure accumulation under the valve disk required to overcome the closure force maintained by the air actuator spring or pilot disk. The valves fail closed on a loss of air or electrical power. The amount of pressure accumulation required to lift the disk off the seat is not adjustable nor do the valves have a certified rate of discharge capacity. To demonstrate the ability of the valves to provide thermal overpressure protection, a calculation will be performed to determine the amount of pressure accumulation required to lift the valve off the seat. Subsequent testing will consist of timing the valve to the open position. Any degradation of the valves operating characteristics will be detected by a deviation in stroke time. In addition, the air operated valves receive diagnostic testing per the AOV testing program.

TECHNICAL POSITION - TP-03

System: Service Water

Valve(s):

SW-1040A-1	SW-1040A-2	SW-1042A-1	HS-2203A-1
SW-1040B-1	SW-1040B-3	SW-1042B-1	HS-2203B-1
SW-910A	SW-910B	SW-914A	SW-914B
SW-910C	SW-910D	SW-914C	SW-914D

Category: B

Code Class: 3

Function: These air-operated valves are required to change position in order to accomplish a safety function as defined within the scope of the ASME OM Code.

Technical Position:

These air-operated valves are provided with unusual control circuitry in that they actuate from a common control switch in groups of 4 as identified above. As a result of this control circuitry, preconditioning becomes a concern unless the valves associated with the particular switch are simultaneously timed upon switch actuation. It is the NRCs expectations that inservice testing be performed in the as-found condition whereas, the as-found condition is generally considered to be the condition of a valve without pre-stroking or maintenance (re: NRC Information Notice 97-16). However, as discussed in NUREG-1482, Section 3.5, the Code does not specifically require testing to be performed in the as-found condition except for relief valves and Type C seat leakage testing, per Appendix J. Further, the NUREG states that most inservice testing is performed in a manner that generally represents the condition of a standby component if it were actuated in the event of an accident. The discussion indicates that the NRC recognizes that there may be situations where as-found testing may not be performed. KNPP considers simultaneous stroke timing of multiple valves from a common control switch is one such situation. This position is based on the following; the testing activity would require a minimum of 4 Control Room operators clustered in a small area, which could be distracting and not commensurate with Control Room decorum. KNPP proposes to stroke time 2 of the 4 valves in the as-found condition then immediately stroke time the remaining 2 valves. Procedural controls will be in place to control the test sequence based upon system alignment, which represents the previous valve(s) cycle operation. This sequence of stroke timing does not violate Code requirements and provides adequate assurance of valve reliability.

TECHNICAL POSITION - TP-04

System: Diesel Generator Mechanical System

Component(s): Diesel Fuel Oil Transfer Pumps 1A and 1B

Code Class: NCC

Function: The diesel fuel oil transfer pumps perform a function important to safety by transferring fuel oil from storage tank to the day tanks, which have sufficient capacity for approximately 4 hours of engine operation. This function ensures a continuous fuel supply in support of long term operation of the engine during accident conditions.

Technical Position: The diesel generator fuel oil transfer pumps are not within the scope of 10 CFR 50.55a(f) due to their non-Code classification and are therefore, outside the scope of OM-6. However, 10 CFR 50.55a(f)(6)(ii) states that the Commission may require the licensee to follow an augmented inservice test program for pumps and valves which the Commission deems that added assurance of operational readiness is necessary. In addition, the intent of 10 CFR 50 Appendix B, is that all components, such as pumps and valves, necessary for safe operation are to be tested to demonstrate that they will perform satisfactorily in service. Further, NUREG-1482, Appendix A, Position 11, Question Group 53, states "If non-Code components are included in the ASME Code IST program and certain Code provisions cannot be met, the Commission regulations (10 CFR 50.55a) do not require a request for relief to be submitted to the staff. Nevertheless, documentation that provides assurance of the continued operability of the non-Code components through the performed tests should be available at the plant site. The intent of this Technical Position is to provide that assurance.

The diesel fuel oil transfer pumps are submerged within the underground fuel oil storage tanks in approximately 10 feet of diesel fuel oil and are inaccessible for routine testing or monitoring. In addition, instrumentation is not provided to measure rotor vibration, flow rate, differential pressure, etc.

The diesel fuel oil transfer pumps will be verified operable on a monthly basis in conjunction with routine surveillance testing (i.e. 2 hour duration run test) of the Emergency Diesel Generators. Operability of the fuel oil transfer pumps is defined as the ability to transfer fuel oil from the underground fuel oil storage tanks to the day tanks.

Note: This method of testing was previously discussed via relief request IST-RR-23. NRC Safety Evaluation dated July 15, 1994 stated that approval was not required due to components being outside the scope of 10 CFR 50.55a.

TECHNICAL POSITION - TP-05

System:	Feedwater
Valve(s):	FW-7A FW-7B FW-10A FW-10B
Category:	B
Code Class:	NCC
Function:	These air-operated valves are required to change position in order to accomplish a safety function as defined within the scope of the ASME OM Code.

Technical Position:

The feedwater regulating valves and bypass valves are full stroke exercised and timed each time the plant is required to be taken to cold shutdown condition, unless the test has been performed within the last 3 months. Full stroke exercising the feedwater control bypass valves during power operation could induce perturbations in normal feedwater flow possibly resulting in undesirable fluctuations in steam generator level. Exercising the feedwater flow control valves closed quarterly during power operation would result in a loss of normal feedwater flow to the associated Steam Generator. Isolation of normal feedwater flow during power operation could potentially cause a severe steam generator level transient which could result in a plant trip, and could initiate an auxiliary feedwater system actuation signal unnecessarily.

On-line maintenance (e.g. packing adjustment), that would typically require a retest, may be performed without the necessity of a retest as long as an assessment of the effect of the maintenance on valve performance is done. The assessment must demonstrate that 1) for packing adjustments, that the adjustment is within torque limits specified by the manufacturer for the existing configuration and 2) the performance parameters of the valve are not adversely affected. A confirmatory test must be performed at the first available opportunity when plant conditions allow testing (i.e. hot shutdown).

Packing adjustments, which are beyond the manufacturer's limits, may not be performed without an engineering analysis and input from the manufacturer.

TECHNICAL POSITION - TP-06

System:	Various
Valve(s):	Various Active Manual Isolation Valves
Category:	B
Code Class:	2 and 3
Function:	Manual isolation valves which are required to change position in order to accomplish a safety function as defined within the scope of the ASME OM Code.
Code Requirement:	Active Category A and B valves shall be tested nominally every 3 months, except as provided in paras. 4.2.1.2, 4.2.1.5, and 4.2.1.7. (para. 4.2.1.1)
Alternate Testing:	KNPP proposes to full-stroke exercise manual valves, within the scope of the OM Code, at least once every 2 years, in lieu of the exercise interval of 3 months specified in OMa-1988, Part 10.

Technical Position: 10 CFR 50.55.a(f)(4)(iv) allows test requirements set forth in subsequent editions of codes and addenda approved for use in 10CFR50.55a(b) to be adopted without requesting relief provided all related provisions or requirements are met.

Effective October 28, 2002, ASME Code OMb-2000 Addenda was incorporated into 10CFR50.55a(b). 10CFR50.55a(b)(3)(vi) clarifies the NRC position that the interval for exercising manual valves may not exceed 2 years when using the 1999 and 2000 Addenda of ISTC-3450.

Subsection ISTC-3450, Manual Valves, of the OMb-2000 addenda establishes a 5 year frequency for manual valve exercising except where adverse conditions may require more frequent exercising. Examples of adverse conditions are harsh service environment, lubricant hardening, corrosive or sediment laden process fluid, or degraded valve components.

The manual valves for which the testing applies are exposed to relatively clean process fluids and are located in environments where temperatures should not have an adverse affect on valve operability. Due to the simplicity of manual valve design, and the limited number of failure mechanisms, it is KNPPs position to use ASME Code OMb-2000 Addenda subsection ISTC-3450 as further clarified in 10CFR50.55a(b)(3)(vi) and exercise manual valves on a 2 year frequency or more frequently when exercised to accomplish a process function if performed routinely.

TECHNICAL POSITION - TP-07

System: Service Water

Valve(s): SW-1A1 SW1A2
SW-1B1 SW1B2

Category: C

Code Class: 3

Function: These normally open check valves are located in the discharge line from the service water pumps. The valves perform an ACTIVE safety function in the OPEN direction. They are required to open upon the associated pump starting to provide a path for SW flow to the associated train service water header. The worst-case condition under which the SW system is required to function would be a LOCA/LOOP with a coincidental single active failure. Under these conditions, each service train is capable of supplying 100% of the required accident cooling flow to safety-related components.

These check valves also perform an AUGMENTED function in the CLOSED direction. Valve closure on reversal or cessation of flow prevents diversion of discharge flow from the inservice pumps through an idle or out-of-service pump in lieu of being properly directed to the SW headers. This is a concern only during power operation since during an accident train operability is dependent upon two pump operation and the trains are adequately separated. This function is necessary to protect the pump from reverse rotation which could render it inoperable due to the loosening of line shaft couplings, although, it would require a significant amount of diverted flow for reverse rotation.

Partial Stroke Testing: These valves are tested in the partial open position and the full closed position on a quarterly frequency.

Technical Position: Performance of full open stroke testing requires abnormal alignment of the service water system to achieve required flow rates as described in Refueling Outage Test Justification, ROJ-05. These alignments may result in additional component thermal stresses and abnormally low system header pressure conditions. As an alternative Kewaunee will perform disassembly and inspection in accordance with the guidelines provided in ISTC-4.5.4(c) of OMA-1996.

The check valves will be disassembled and inspected on a nominal 18 month frequency, not to exceed 6 years for the group of 4 valves. This valve grouping and inspection frequency is described in Generic Letter 89-04, Position 2 and further supported by NUREG 1482 Appendix A.

Following check valve disassembly and inspection the check valve will be partial stroke tested. Check valve disassembly and inspection is also performed in conjunction with the routine maintenance task for service water pump replacement. Following pump replacement a surveillance procedure is performed on the new pump to establish a pump reference curve. During this surveillance the valves are open tested under substantial flow conditions. These valve operations meet the recommended partial valve stroking after reassembly as described in GL 89-04 position 2.