10 CFR 50.55a(f)(5)
10 CFR 50.55a(a)(3)

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Palo Verde Nuclear Generating Station

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102-05732-DCM/RJR
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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Third 10-Year Interval Pump and Valve Inservice Testing Program
Relief Requests PRR-01, PRR-02, PRR-03, PRR-04, PRR-05, PRR-06, PRR-07 and VRR-01

Pursuant to 10 CFR 50.55a(f)(5)(i), Arizona Public Service Company (APS) has revised the Palo Verde Nuclear Generating Station (PVNGS) pump and valve inservice testing program for the third 10-year test interval for Units 1, 2, and 3. The third interval begins on January 15, 2008. Enclosure 1 provides a summary of the Palo Verde pump and valve inservice testing (IST) program and contains the relief requests required for the third interval. Each of these relief requests were previously authorized for Palo Verde's second interval by the NRC Safety Evaluation dated July 8, 1999, except PRR-02. Relief request PRR-02 is being requested because the installed instrumentation does not meet the new accuracy requirement from Table ISTB-3500-1 of the 2001 Edition with the 2003 Addenda of the ASME OM Code. Enclosure 2 is an information copy of the revised IST program.

APS requests approval of the relief requests prior to the start of the third inservice testing interval which will begin on January 15, 2008.

This letter contains no new commitments. If you have any questions about this request, please contact Glenn A. Michael at (623) 393-5750.

Sincerely,

D.C. Mims

A047

NRR

DCM/GAM/RJR/gt

Enclosure 1 - Palo Verde Pump and Valve Inservice Testing Program Summary
Attachment to Enclosure 1 - Third 10-Year Interval Pump and Valve Inservice Testing Program Relief Requests PRR-01, PRR-02, PRR-03, PRR-04, PRR-05, PRR-06, PRR-07 and VRR-01
Enclosure 2 - Information Copy of the Revised Third 10-Year Interval Pump and Valve Inservice Testing Program

cc: B. S. Mallett NRC Region IV Regional Administrator
M. T. Markley NRC NRR Project Manager
G. G. Warnick NRC Senior Resident Inspector for PVNGS

ENCLOSURE 1

Palo Verde Pump and Valve
Inservice Testing Program Summary

Palo Verde Pump and Valve Inservice Testing Program Summary

Section 50.55a of Title 10 of the *Code of Federal Regulations* (10 CFR), requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code incorporated by reference in the regulations, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Nuclear Regulatory Commission (NRC or the Commission) pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(5)(iii) of 10 CFR 50.55a. In accordance with 10 CFR 50.55a(f)(4)(ii), Arizona Public Service Company (APS) is required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. In accordance with 50.55a(f)(4)(iv), inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to NRC approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions and addenda are met.

The Palo Verde Nuclear Generating Station (PVNGS) Pump and Valve Inservice Testing Program was developed in accordance with the 2001 Edition with the (w/) 2003 Addenda of the ASME OM Code. The Palo Verde third 10-year IST interval for all three units begins on January 15, 2008.

The attachment to this enclosure contains the relief requests required for the third interval. Enclosure 2 is an information copy of the revised IST program.

Relief Requests PRR-02, PRR-06, PRR-07 and VRR-01 are being submitted under the provision of 10 CFR 50.55a(a)(3)(i), wherein the proposed alternatives would provide an acceptable level of quality and safety.

Relief Requests PRR-01, PRR-03, PRR-04 and PRR-05 are being submitted under the provisions of 10 CFR 50.55a(f)(5)(iii), wherein inservice testing that is impractical for the facility.

Each of these relief requests were previously authorized for Palo Verde's second interval by the NRC Safety Evaluation dated July 8, 1999, except PRR-02. Relief request PRR-02 is being requested because the installed instrumentation does not meet the new accuracy requirement from Table ISTB-3500-1.

The attached APS requests demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety or (2) conformance is impractical for the facility.

APS requests approval of the relief requests prior to the start of the third inservice testing interval which will begin on January 15, 2008.

Attachment to Enclosure 1

Third 10-Year Interval Pump and Valve Inservice Testing Program Relief Requests

PRR-01, PRR-02, PRR-03, PRR-04, PRR-05, PRR-06, PRR-07 and VRR-01

PUMP RELIEF REQUEST PRR-01

Relief Request In Accordance with 10 CFR 50.55a(f)(5)(iii)

-- Inservice Testing Impracticality –

Essential Auxiliary Feedwater Pump Flow Rate Measurement

ASME Components Affected:

Pump ID	Pump Description	Code Class	Pump Group
AFA-P01	Essential Auxiliary Feedwater Pump (Turbine-Driven)	3	B
AFB-P01	Essential Auxiliary Feedwater Pump (Motor-Driven)	3	B

Component/System Function:

The essential auxiliary feedwater (AF) pumps supply water to the steam generators during an accident. They also can be used to supply feedwater to the steam generators during plant startup and shutdown.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5122, "Group B Test Procedure," "Group B tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5122(b), "The differential pressure or flow rate shall be determined and compared to its reference value."

Impracticality of Compliance:

The Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow

to a specified value) are impractical since this is a fixed resistance recirculation path with no flow instrumentation provided. When the pump operates on minimum flow recirculation (approx. 260 gpm) the specified reference point is essentially achieved by the recirculation lines fixed resistance. To establish the fixed resistance the minimum flow recirculation line contains an administratively controlled locked-throttled drag valve and a locked open manual isolation valve. The use of an ultrasonic flowmeter was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the AF mini-flow piping. Allowing the flow to remain fixed by the locked-in resistance increases the potential for repeatable test results and degradation monitoring rather than changing the resistance based on ultrasonic flow meter readout fluctuations. With this understanding, there is little value added in installing flow instrumentation to measure and record the flow with instrumentation that meets ISTB-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

To comply with the Code there are only two practical flow paths available for testing AFA-P01 and AFB-P01. The primary flow path is into the main feedwater lines to the steam generators. The other flow path is the minimum flow recirculation line that recirculates back to the condensate storage tank. The flow path to the steam generators is equipped with flow instrumentation, but the recirculation line is a fixed-resistance circuit with no provisions for flow indication.

Use of the primary flow path at power would inject cold auxiliary feedwater into the main feedwater lines. The resulting temperature perturbations could lead to thermal shock/fatigue damage to the feedwater piping and steam generators, and the cooldown of the reactor coolant system could cause undesirable reactivity variations and power fluctuations.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed at approximately 260 gpm and differential pressure is used to monitor degradation. Use of an ultrasonic flow meter and possible adjustment of the fixed resistance introduces the potential for less accurate degradation monitoring than currently employed.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group B pump testing for pumps AFA-P01 and AFB-P01 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance to establish the specified reference point. ISTB-5100(b)(2) allows the use of bypass test loops to be used for Group B tests. The PVNGS minimum flow recirculation line is designed to meet the pump manufacturers

operating specifications of approximately 260 gpm. Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5100-1.

Pumps AFA-P01 and AFB-P01 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps AFA-P01 and AFB-P01 are standby pumps. Little degradation is expected during plant operation when the pumps are idle except for testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with no flow instrumentation provided.

Duration of Proposed Alternative:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

Complies with NRC Generic Letter 89-04, Position 9. Relief Request PRR-01 was previously authorized for Palo Verde pursuant to 10 CFR 50.55a(f)(6)(i) for the second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP RELIEF REQUEST PRR-02

Relief Request In Accordance with 10 CFR 50.55a(a)(3)(i)
-- On the basis that the proposed alternative provides an acceptable level of quality and safety --

Diesel Fuel Oil Transfer Pump Suction Pressure Measurement

ASME Components Affected

Pump ID	Pump Description	Code Class	Pump Group
DFA-P01	Diesel Generator Fuel Oil Transfer Pump	3	B
DFB-P01	Diesel Generator Fuel Oil Transfer Pump	3	B

Component/System Function:

Transfer diesel fuel from the fuel oil storage tank to the EDG day tank

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3510, "General," ISTB-3510(a), "Accuracy", "Instrument accuracy shall be within the limits of Table ISTB-3500-1."

Table ISTB-3500-1, "Required Instrument Accuracy", Pressure, Comprehensive Test, ± 0.5% accuracy.

Reason for the Request:

There are no inlet pressure gauges installed for this pump configuration. Specifically, the pumps are horizontal, centrifugal type with an integral motor. They operate submerged in the diesel fuel oil storage tank. The pump and drive motor are completely housed in an enclosed steel casing with no shaft penetrations requiring seals or packing. The casing has a hermetically sealed compartment for the stator windings of the motor to prevent entrance of pumped liquid or vapor. Pump bearings are cooled by recirculation of pumped fluid. The entire assembly is suspended from a cover plate, which is bolted to a nozzle on the tank.

The diesel generator fuel oil storage tank is equipped with level instrumentation (DFN-LI-33 and DFN-LI-34) having a calculated loop accuracy of ± 1.5%. The instrument reads out in percent of tank level which is converted to suction pressure during the quarterly pump surveillance test. The calibrated instrument range results in a suction pressure span of 0.2 psig to 4.4 psig. This instrument accuracy is acceptable for use

during Group B pump testing but does not meet the ± 0.5% accuracy as required by Table ISTB-3500-1 for Comprehensive Pump Testing performed every 2 years.

Proposed Alternative and Basis for Use:

The installed instrumentation converts to a full-scale range of 4.4 psig, which only slightly exceeds the pump suction reference value of 3.8 psig (full scale equals 1.15 times reference).

Considering the existing 1.5% accuracy of the level instrument, the reading could be as high as 3.85 psig or as low as 3.74 psig. This results in less than a 0.06 psig difference in the readings and is considered insignificant when monitoring for degradation. The existing accuracy is equivalent to the 1.5% minimum accuracy allowed by the combination of instrument full-scale range and accuracy as specified in Subsection ISTB 3510 for comprehensive pump testing. This accuracy provides adequate assurance of operability. The current instrumentation provides sufficient repeatability to allow for an evaluation of the pump hydraulic condition and detect pump degradation.

Use of the existing diesel generator fuel oil storage tank instrumentation should be considered an acceptable alternative to the accuracy requirements of Table ISTB-3500-1.

Supporting Facts:

Technical Specification 3.8.3.1 requires that the diesel generator fuel oil storage tank be maintained at ≥80% which is verified every 31 days to assure sufficient supply for 7 days of full load operation. The difference between minimum allowable tank level and top of the tank is only 26.4 inches. Due to strict controls placed on fuel oil level, the suction pressure cannot vary by more than 0.7 psig. Review of test history shows that the maximum variance recorded is approximately 0.5 psig. The suction pressure is essentially fixed by the TS level requirements, allowing for very little variation in suction pressure. There is no value added in providing more precise suction pressure instrumentation for monitoring pump degradation.

The following test history shows the essentially constant suction pressure:

Unit	Pump ID	Date	Suction Pressure
1	1MDFAP01	6/6/2006	3.8
	1MDFAP01	8/24/2006	4
	1MDFAP01	11/15/2006	4
	1MDFAP01	2/8/2007	4
	1MDFAP01	5/3/2007	3.9
	1MDFBP01	5/18/2006	4.3
	1MDFBP01	8/10/2006	3.9
	1MDFBP01	11/2/2006	3.6
	1MDFBP01	1/25/2007	3.8
	1MDFBP01	4/19/2007	3.85

PUMP RELIEF REQUEST PRR-02

Unit	Pump ID	Date	Suction Pressure
2	2MDFAP01	4/20/2006	3.7
	2MDFAP01	5/4/2006	3.6
	2MDFAP01	7/25/2006	4
	2MDFAP01	1/10/2007	4
	2MDFAP01	4/5/2007	3.9
	2MDFBP01	2/9/2006	3.9
	2MDFBP01	7/13/2006	3.8
	2MDFBP01	10/15/2006	3.8
	2MDFBP01	12/27/2006	3.7
	2MDFBP01	3/21/2007	3.7
3	3MDFAP01	4/30/2006	4.1
	3MDFAP01	6/28/2006	3.7
	3MDFAP01	9/19/2006	4.1
	3MDFAP01	12/15/2006	3.7
	3MDFAP01	3/6/2007	3.9
	3MDFBP01	4/18/2006	3.4
	3MDFBP01	6/13/2006	3.9
	3MDFBP01	9/5/2006	4
	3MDFBP01	11/28/2006	3.9
	3MDFBP01	2/22/2007	3.8

Using the installed instrument (DFN-LI-33 and DFN-LI-34) for Group B and Comprehensive Pump Testing (CPT) provides an acceptable level of quality and safety since the instrument used yields a reading that is at least equivalent to that achieved using an instrument that meets the Code requirements as described in Table ISTB-3500-1.

The installed level instruments, DFN-LI-33 and DFN-LI-34, will be used to determine diesel fuel oil transfer pump suction pressure during inservice testing.

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or (ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The existing 1.5% accuracy of the level instrument discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternative:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

None

References:

NUREG 1482, Revision 1, 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."

PUMP RELIEF REQUEST PRR-03

Relief Request In Accordance with 10 CFR 50.55a(f)(5)(iii)
-- Inservice Testing Impracticality –

LPSI Pump Flow Rate Measurement

ASME Components Affected

Pump ID	Pump Description	Code Class	Pump Group
SIA-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIB-P01	Low Pressure Safety Injection (LPSI) Pump	2	A

Component/System Function:

LPSI pumps SIA-P01 and SIB-P01 provide low-pressure coolant injection of borated water into the reactor coolant system under accident conditions. They also provide shutdown cooling flow post-accident and during normal reactor startup and shutdown.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5221, "Group A Test Procedure," "Group A tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5221(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

ISTB-5221(c), "Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values."

Impracticality of Compliance:

The Code requires the Group A reference point flow rate to be established at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value). It is impractical to meet this requirement since this is a

fixed resistance recirculation path of approximately 180 gpm with limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation, the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

During normal plant operation, the LPSI pumps cannot develop sufficient discharge pressure to overcome RCS pressure and allow flow through the safety injection headers. Thus, during quarterly testing, LPSI flow is routed through a minimum flow recirculation line to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 180 gpm) of the design flow (4200 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined to be impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The LPSI pumps are categorized as Group A since they are normally used to provide shutdown cooling flow during shutdown operations, and occasionally for recirculating the refueling water tank when the unit is at power. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed and differential pressure is used to monitor degradation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group A pump testing for pumps SIA-P01 and SIB-P01 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 180 gpm to establish the specified reference point. Subsection ISTB, ISTB-5200(b)(1) allows the use of bypass test loops to be used for Group A tests. The flow rate through the loop is established at the highest practical flow rate of approximately 180 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be

measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5200-1.

Pumps SIA-P01 and SIB-P01 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P01 and SIB-P01 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group A reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-03 was previously authorized for Palo Verde as Relief Request PRR-05 pursuant to 10 CFR 50.55a(f)(6)(i) for the second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP RELIEF REQUEST PRR-04

Relief Request In Accordance with 10 CFR 50.55a(f)(5)(iii)
-- Inservice Testing Impracticality –

HPSI Pump Flow Rate Measurement

ASME Components Affected

Pump ID	Pump Description	Code Class	Pump Group
SIA-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIB-P02	High Pressure Safety Injection (HPSI) Pump	2	B

Component/System Function:

The HPSI pumps provide high-pressure coolant injection of borated water into the reactor coolant system under accident conditions. They also provide flow for long-term cooling and flushing to prevent boron precipitation.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5122, "Group B Test Procedure," "Group B tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5122(b) "The differential pressure or flow rate shall be determined and compared to its reference value."

Impracticality of Compliance:

The Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) is impractical since this is a fixed resistance recirculation path of approximately 170 gpm which is measured by limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined to be impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed

resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

During normal plant operation, the HPSI pumps cannot develop sufficient discharge pressure to overcome RCS pressure and allow flow through the safety injection headers. Thus, during quarterly testing, HPSI flow is routed through a minimum flow recirculation line to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 170 gpm) of the design flow (815 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The HPSI pumps are categorized as Group B. Pump SIB-P02 is used only occasionally to recharge the safety injection tanks. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed and differential pressure is used to monitor degradation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group B pump testing for pumps SIA-P02 and SIB-P02 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 170 gpm to establish the specified reference point. ISTB-5100(b)(2) allows the use of bypass test loops to be used for Group B tests. The PVNGS minimum flow recirculation line is designed to meet the pump manufacturers operating specifications. The flow rate through the loop is established at the highest practical flow rate of approximately 170 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5100-1.

PUMP RELIEF REQUEST PRR-04

Pumps SIA-P02 and SIB-P02 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P02 and SIB-P02 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-04 was previously authorized for Palo Verde as Relief Request PRR-06 pursuant to 10 CFR 50.55a(f)(6)(i) for the second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP RELIEF REQUEST PRR-05

Relief Request In Accordance with 10 CFR 50.55a(f)(5)(iii)
-- Inservice Testing Impracticality –

Containment Spray Pump Flow Rate Measurement

ASME Components Affected

Pump ID	Pump Description	Code Class	Pump Group
SIA-P03	Containment Spray (CS) Pump	2	A
SIB-P03	Containment Spray (CS) Pump	2	A

Component/System Function:

CS pumps SIA-P03 and SIB-P03 deliver borated water to the containment spray headers, providing containment cooling and pressure control during accident conditions. The CS pumps can also be lined up to provide flow for shutdown cooling.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5221, "Group A Test Procedure," "Group A tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5221(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

ISTB-5221(c), "Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values."

Impracticality of Compliance:

The Code requires the Group A reference point flow rate to be established at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value). It is impractical to meet this requirement since this is a fixed resistance recirculation path of approximately 190 gpm with limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm

ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation, the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed at approximately 190 gpm and differential pressure is used to monitor degradation. The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The normal containment spray flow path cannot be used for testing the CS pumps without spraying down the inside of the containment building and risking damage to important equipment. The reactor coolant system (RCS) injection portion of the shutdown cooling flow path cannot be used for testing during plant operation because the CS pumps are unable to develop sufficient discharge pressure to overcome RCS pressure.

The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 190 gpm) of the design flow (3890 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. A larger recirculation flowpath is available; however, this requires an alternate line up and the same limited capability flow instrument exists in this portion of the recirculation line.

The larger recirculation flowpath is capable of carrying higher flow, but routine surveillance testing at less than the full flow reference value is not practical because of the pump rumble range (1800-2800 gpm). Testing in or near the rumble range is not practical because of the potential for equipment damage. Testing at flow rates above the rumble range (> 2800 gpm) is not practical because flow velocities in the recirculation piping would exceed the design criteria.

The CS pumps are categorized as Group A since they are normally used to provide shutdown cooling flow during shutdown operations. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group A pump testing for pumps SIA-P03 and SIB-P03 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 190 gpm to establish the specified reference point. ISTB-5200(b)(1) allows the use of bypass test loops to be used for Group A tests. The flow rate through the loop is established at the highest practical flow rate of approximately 190 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5200-1.

Pumps SIA-P03 and SIB-P03 will be comprehensively tested in accordance with ISTB-5223, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P03 and SIB-P03 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group A reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

PUMP RELIEF REQUEST PRR-05

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-05 was previously authorized for Palo Verde as Relief Request PRR-11 pursuant to 10 CFR 50.55a(f)(6)(i) for the second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP RELIEF REQUEST PRR-06

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(ii)
-- On the basis that the proposed alternative provides an acceptable level of quality and safety --
Charging Pump Vibration Measurement

ASME Components Affected

Pump ID	Pump Description	Code Class	Pump Group
CHA-P01	Charging Pump	2	A
CHB-P01	Charging Pump	2	A
CHE-P01	Charging Pump	2	A

Component/System Function:

The charging pumps provide makeup water to the reactor coolant system for chemistry and volume control. They also provide auxiliary spray to the pressurizer and reactor coolant pump seal injection.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3510, "General", ISTB-3510(e), "Frequency Response Range", "The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump rotational speed to at least 1000 Hz."

Reason for Request:

The charging pumps are positive-displacement pumps with a constant running speed of 199 rpm (equivalent to 3.3 Hz). Compliance with ISTB-3510(e) would require using vibration instrumentation with a frequency response range of 1.1 Hz to at least 1000 Hz.

A low-speed probe with a frequency response range of 1.6 Hz to 100 Hz was purchased specifically for charging pump testing when the IST requirement for frequency response was one-half pump speed to at least pump shaft rotational speed. However, this probe does not meet the lower bound or the upper bound of the current Code-required frequency response range.

The charging pump bearings are oil-lubricated, sleeve type journal bearings. Because of the high reciprocating loads, the charging pump bearings are not susceptible to oil whirl, which is the primary failure mode that causes vibration below pump shaft rotational speed. There are no other failure mechanisms that manifest themselves with elevated vibration levels in the range of one-third to one-half pump shaft rotational frequency; all the remaining failure modes cause vibration at or above the pump speed. Experience

with these pumps confirms this fact. Therefore vibration instrumentation with a frequency response range above 1.6 Hz is acceptable for monitoring vibration of the charging pumps.

The low-speed probe is sensitive to vibration frequencies up to 30 times the running speed of the charging pumps. This is sufficient to identify bearing degradation, mechanical rubs, and other pump problems producing high-frequency vibrations. These pumps are susceptible to degradation mechanisms that would manifest themselves in the 1.6-100 Hz range and not in the extended vibration range required to be monitored by the Code (100-1000 Hz). Therefore, use of the higher frequency vibration probe provides no benefit. The charging pumps are monitored for other symptoms of degradation under the PVNGS Predictive Maintenance Program (see PRR-07 for a description of the PVNGS Predictive Maintenance Program).

Proposed Alternatives and Basis for Use:

The instrumentation used to measure charging pump vibration will have a frequency response range from 1.6 Hz to 100 Hz. Monitoring in the extended vibration range required to be monitored by the Code (100-1000 Hz) provides no benefit.

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The low-speed probe with a frequency response range of 1.6 Hz to 100 Hz discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

Relief Request PRR-06 was previously authorized for Palo Verde as Relief Request PRR-07 pursuant to 10 CFR 50.55a(a)(3)(ii) for second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP RELIEF REQUEST PRR-07

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(i)
-- On the basis that the proposed alternative provides an acceptable level of quality and safety --

Smooth Running Pumps

ASME Components Affected:

Pump ID	Pump Description	Code Class	Pump Group
AFA-P01	Essential Auxiliary Feedwater Pump (Turbine Driven)	3	B
AFB-P01	Essential Auxiliary Feedwater Pump (Motor Driven)	3	B
CTA-P01	Condensate Transfer Pump	3	A
CTB-P01	Condensate Transfer Pump	3	A
ECA-P01	Essential Chilled Water Circulation Pump	3	A
ECB-P01	Essential Chilled Water Circulation Pump	3	A
EWA-P01	Essential Cooling Water Pump	3	A
EWB-P01	Essential Cooling Water Pump	3	A
PCA-P01	Spent Fuel Pool Cooling Pump	3	A
PCB-P01	Spent Fuel Pool Cooling Pump	3	A
SIA-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIB-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIA-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIB-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIA-P03	Containment Spray Pump	2	A
SIB-P03	Containment Spray Pump	2	A

SPA-P01	Essential Spray Pond Pump	3	A
SPB-P01	Essential Spray Pond Pump	3	A

Component/System Function:

Various

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," Reference values shall be obtained as follows: (a) Initial reference values shall be determined from the results of testing meeting the requirements of ISTB-3100, Preservice Testing, or from the results of the first inservice test.

ISTB-3300(f), "All subsequent test results shall be compared to these initial reference values or to new reference values established in accordance with ISTB-3310, ISTB-3320, or ISTB-6200(c)."

ISTB-6200(a), "Alert Range", "If the measured test parameter values fall within the alert range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1, or Table ISTB-5300-2, as applicable, the frequency of testing specified in ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition is corrected."

ISTB-6200(b), "Action Range", "If the measured test parameter values fall within the required action range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1, or Table ISTB-5300-2, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition is corrected, or an analysis of the pump is performed and new reference values are established in accordance with ISTB-6200(c)."

Reason for Request:

Palo Verde has several pumps with vibration parameters readings in the range of $\leq$0.05 ips. Vibration velocities in this range can be significantly affected by hydraulic flow noise and repeatability of the vibration instruments. As a result, Palo Verde could be required to increase the frequency of specified testing when no degradation of the monitored equipment exists.

PVNGS expends considerable resources on preventive and predictive maintenance. One result of these efforts is a number of pumps run very smoothly. For example, many pumps in the PVNGS IST Program would currently be candidates for "smooth-running" status under PRR-07, as shown in the table below. To impose Code-mandated Alert and Required Action values on "smooth-running" pumps unnecessarily penalizes PVNGS for achieving this high level of performance.

Pump	Typical Vibration Reference Values inch per second (ips)
Auxiliary Feedwater	0.12 - 0.27
Condensate Transfer *	0.0044 – 0.0883
Essential Chilled Water *	0.0075 – 0.0597
Essential Cooling Water *	0.0295 – 0.0931
Low Pressure Safety Injection *	0.0343 – 0.174
High Pressure Safety Injection	0.0667 – 0.296
Containment Spray	0.078 – 0.161
Spent Fuel Pool Cooling *	0.031 – 0.110
Essential Spray Pond *	0.0201 – 0.0864

* Candidates for "smooth-running" status under PRR-007

For displacement reference values less than 0.5 mils, it is noted that the Section XI Code in effect for the first interval of the IST Program (1980 Edition, Winter 1981 Addenda) sets the Alert Range at > 1.0 mil and the Required Action Range at > 1.5 mil. This implies a minimum reference value of 0.5 mils, which is equivalent to 0.047 ips for 1800 rpm pumps and 0.094 ips for 3600 rpm pumps. The effective reference values proposed for smooth-running pumps are roughly equal to the implied Section XI reference values for 1800 rpm pumps and more conservative than the implied reference values for 3600 rpm pumps. Without proposed alternative, the Alert Ranges for several smooth running pumps will be reduced by a factor of 10.

Proposed Alternatives and Basis for Use:

Vibration parameters that have reference values ≤ 0.05 ips are considered "smooth-running". When vibration velocities are less than 0.05 ips, changes have been shown to be non-significant. To reduce any unnecessary penalty for those pump parameters considered "smooth-running", the Alert and Required Action values for these "smooth-running" parameters will be determined as if their reference value is 0.05 ips; that is, the Alert Range will be 0.125 ips to 0.3 ips, and the Required Action Range will be > 0.3 ips. Candidates for "smooth-running" status will be analyzed per ISTB-3300(g) and ISTB-6400 to verify that use of this relief request will not prevent the detection of significant pump degradation. If any of these parameters are outside normally expected ranges, an evaluation will be performed and appropriate corrective actions will be taken.

The basis for use of these proposed Alert and Required Action ranges is discussed below.

In addition to the Code-mandated monitoring, these pumps are monitored under the PVNGS Predictive Maintenance Program. This program includes the following:

- Spectrum band monitoring
- Bearing acceleration monitoring (on ball and roller bearings only)
- Bearing oil analysis (for oil lubricated bearings)

- OMN-1, R 0, 3.4, *Effect of MOV Replacement, Repair, or Maintenance*, states that when an MOV or its control system is replaced, repaired, or undergoes maintenance that could affect the valve's performance, new inservice test values shall be determined or the previously established inservice test values shall be confirmed before the MOV is returned to service.

  Diagnostic test results within the MOV Program setpoint bands are considered to be satisfactory and do not require analysis.

- OMN-1, R 0, 3.5, *Grouping of MOVs for Inservice Testing*, states that grouping MOVs for inservice testing is permissible.

  PVNGS currently has elected not to use Grouping of MOVs for Inservice Testing.

- OMN-1, R 0, 3.7, *Risk Basis Criteria for MOV Testing*, states that if establishing risk based criteria for performance testing, the Owner shall consider the following:
  (a) develop an acceptable basis for MOV risk determination;
  (b) develop MOV screening criteria to determine each MOV's contribution to risk; and
  (c) establish applicability by a documented evaluation from a plant expert panel.

  Palo Verde is currently not planning to implement a Risk Informed Program for its IST program. As noted above, Palo Verde uses risk/safety significance and MOV margin as part of the JOG program to establish MOV testing frequency. This provision is not applicable.

- OMN-1, R 0, 6.3, E*valuation of Data*, and 6.4, *Determination of MOV Functional Margin*, state that the owner shall determine which methods are suitable for evaluating test data for each MOV and application and that the owner shall demonstrate that adequate margin exists between the required torque and available torque and that changes to the operating characteristics of the MOV do not result in reaching a point of insufficient margin before the next schedule test activity.

  Palo Verde utilizes the JOG Program criteria for determining MOV test frequency. The MOV test frequencies have been established to ensure MOV setpoints and MOV margins are maintained over the MOV test interval which satisfies this requirement of OMN-1, R 0,.

- OMN-1, R 0, 6.4.1, *Determination of Required Torque*, states that design basis required torque shall be determined from measurements taken during testing at design basis conditions.

  Palo Verde determines a Stem Factor for rising stem valves whenever stem thrust and stem torque are measured. However, it is not possible to measure thrust and torque on all rising stem valves.

- Motor Current Signature analysis (for all but the smallest motors)

The PVNGS Predictive Maintenance (PdM) Program is part of the Preventive Maintenance (PM) Program described in UFSAR Section 17.2.3.11.1.6. The PM Program was developed using RCM, EPRI, and INPO guidelines as well as factoring in PVNGS site-specific experience and regulatory requirements. The PM Program and PdM activities are controlled by plant procedures. Each of these pumps has a maintenance plan documented in the PM Program which describes the PM and PdM activities performed on that pump. The performance of the system associated with each of these pumps is monitored and compared to performance criteria under the PVNGS Maintenance Rule Program. This ensures the continued effectiveness of the PM program to minimize component failures and maintain or improve system performance (balance availability and reliability).

The PVNGS Predictive Maintenance Program uses vibration analysis, lubricant analysis, and infrared thermographic analysis as appropriate, to predict the need for maintenance so that equipment can be worked prior to failure. The components included in this program include those considered important to safe and reliable plant operation, including certain pumps in the IST Program. The intervals for monitoring are based on manufacturer's recommendations, maintenance history, cost effectiveness, and experience. Although parts of the monitoring, analysis, database, and software used in the Predictive Maintenance Program do not fall under the PVNGS Quality Program, the Predictive Maintenance Program still provides valuable information for assuring the operational readiness of smooth-running pumps.

The vibration analysis program monitors the vibration of rotating machinery. In addition to the vibration at pump bearings, the vibration of the driver (turbine or motor) bearings are also collected and trended. Analyzed parameters and methods include vibration velocity, bearing acceleration, bearing high frequency detection, and spectral analysis.

The lubricant analysis program samples lubricants and analyzes them to identify degradation or negative trends. Most testing is performed at the on-site lubrication laboratory, where capabilities include wear debris, chemical composition, and lubrication cleanliness analysis.

In both the vibration monitoring and lubricant analysis programs, recently acquired data is compared with previous data to detect any indicated degradation of equipment condition. If degradation indicates the reliability of operating equipment may be negatively affected, or if acceptance criteria are no longer being met, appropriate corrective action is taken. Corrective action may include: continuing trending of the degraded condition, if the condition is not considered to be immediately threatening to the equipment and can be corrected during a time window convenient to plant operation; additional testing or monitoring to confirm the suspected degraded condition; inspection and repair of the equipment as necessary; changes to preventive maintenance procedures or schedules; or design changes.

PUMP RELIEF REQUEST PRR-07

The following table contains examples of Unit 1 vibration test result history demonstrates consistent smooth running operation (Unit 2 and 3 are similar):

Unit	Pump	Date	Pump Horizontal	Pump Vertical	Axial
1	CTAP01	7/2/2006	.016	.012	.006
1	CTAP01	9/18/2006	.020	.012	.0079
1	CTAP01	12/11/2006	.021	.014	.007
1	CTAP01	3/8/2007	.019	.012	.0058
1	CTBP01	11/8/2006	.024	.007	.0082
1	CTBP01	12/7/2006	.014	.007	.0095
1	CTBP01	1/29/2007	.016	.006	.011
1	CTBP01	4/25/2007	.017	.007	.009
1	ECAP01	8/22/2006	.036	.034	.010
1	ECAP01	11/13/2006	.044	.027	.0092
1	ECAP01	2/5/2007	.057	.057	.0081
1	ECAP01	5/1/2007	.042	.034	.007
1	ECBP01	8/8/2006	.026	.021	.013
1	ECBP01	10/31/2006	.028	.024	.016
1	ECBP01	1/22/2007	.030	.026	.012
1	ECBP01	4/16/2007	.023	.027	.012
1	EWAP01	8/22/2006	.031	.028	.020
1	EWAP01	11/13/2006	.032	.023	.0214
1	EWAP01	2/6/2007	.033	.031	.0182
1	EWAP01	5/3/2007	.032	.034	.023
1	EWBP01	8/8/2006	.033	.034	.026
1	EWBP01	10/31/2006	.033	.032	.026
1	EWBP01	1/23/2007	.033	.031	.023
1	EWBP01	4/17/2007	.035	.038	.027
1	SIAP01[(b)]	4/11/2004	.033	.048	(a)
1	SIAP01[(b)]	11/29/2005	.047	.053	(a)
1	SIAP01[(b)]	12/8/2005	.043	.061	(a)
1	SIAP01[(b)]	6/1/2006	.057	.071	(a)
1	SIBP01[(b)]	10/4/2002	.031	.032	(a)
1	SIBP01[(b)]	4/23/2004	.044	.060	(a)
1	SIBP01[(b)]	10/16/2005	.027	.035	(a)
1	SIBP01[(b)]	5/29/2006	.041	.062	(a)
1	PCAP01	6/28/2006	.060	.040	.024
1	PCAP01	9/26/2006	.059	.036	.027
1	PCAP01	12/11/2006	.058	.038	.029
1	PCAP01	3/6/2007	.058	.037	.023
1	PCBP01	6/20/2006	.077	.037	.023
1	PCBP01	9/11/2006	.075	.041	.025
1	PCBP01	12/4/2006	.072	.045	.026

Unit	Pump	Date	Pump Horizontal	Pump Vertical	Axial
1	PCBP01	2/26/2007	.071	.041	.021
1	SPAP01[(b)]	8/22/2006	.049	.027	.0275
1	SPAP01[(b)]	11/14/2006	.052	.023	.0270
1	SPAP01[(b)]	2/6/2007	.055	.027	.0250
1	SPAP01[(b)]	5/3/2007	.049	.027	.0283
1	SPBP01[(b)]	8/7/2006	.092	.047	.0261
1	SPBP01[(b)]	11/1/2006	.088	.027	.0240
1	SPBP01[(b)]	1/23/2007	.090	.030	.029
1	SPBP01[(b)]	4/19/2007	.088	.035	.026

(a) – Inaccessible (b) – vibration readings taken at the motor-

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or (ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The revised Alert and Required Action values discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Third 10-year IST Interval.

Precedents:

Relief Request PRR-07 was previously authorized for Palo Verde as Relief Request PRR-08 pursuant to 10 CFR 50.55a(a)(3)(i) for the second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

VALVE RELIEF REQUEST VRR_01

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(i)
On the basis that the proposed alternative provides an acceptable level of quality and safety.

Code Case OMN-1 - MOV Exercising and Stroke Timing

Component(s) Affected:

Motor-operated valve assemblies currently included in the Palo Verde Nuclear Generating Station (PVNGS) Motor-Operated Valve (MOV) Program

Component/System Function: Various

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTA-3130, "Application of Codes Cases," paragraph (b) states that Code Cases shall be applicable to the edition and addenda specified in the test plan.

ISTC-3500, "Valve Testing Requirements," states that active and passive valves in the categories defined in ISTC-1300 shall be tested in accordance with the paragraphs specified in Table ISTC-3500-1 and the applicable requirements of ISTC-5100 and ISTC-5200.

ISTC-3700, "Position Verification Testing," states that valves with remote position indicators shall be observed locally at least once every 2 years to verify the valve operation is accurately indicated.

ISTC-5120, "Motor-Operated Valves," paragraph states that active valves shall have their stroke times measured when exercised in accordance with ISTC-3500.

Reason for Request:

Code Case OMN-1, Revision 0 provides alternative rules to those of OM Code, Subsection ISTC, for preservice and inservice testing to assess the operational readiness of certain electric motor-operated valve assemblies in light-water reactor power plants. However, Regulatory Guide (RG) 1.192 has not yet extended its use to the 2001 Edition w/2003 Addenda of the OM Code which is the basis for the planned third 10-year IST program at Palo Verde.

Proposed Alternatives and Basis for Use:

In lieu of the provisions for MOV testing in Subsection ISTC of the 2001 Edition w/2003 Addenda of the ASME OM Code, APS requests relief for the continued use of ASME Code Case OMN-1, Revision 0.

VALVE RELIEF REQUEST VRR 01

Pursuant to ASME Code Case OMN-1, Revision 0 and the guidelines provided in NUREG-1482, Revision 1, Section 4.2.5, PVNGS proposes to continue implementation of Code Case OMN-1 in lieu of the stroke-time provisions specified in ISTC-5120 for MOVs. Code Case OMN-1 has been determined by the NRC to provide an acceptable level of quality and safety when implemented in conjunction with the conditions imposed in RG 1.192.

The conditions specified in RG 1.192 are as follows:

Regulatory Guide 1.192, Operation and Maintenance Code Case Acceptability, ASME OM Code, dated June 2003 states that licensees may use Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants," Revision 0, in lieu of the provisions for stroke-time testing in Subsection ISTC of the 1995 Edition up to and including the 2000 Addenda of the ASME OM Code when applied in conjunction with the provisions for leakage rate testing in, as applicable, ISTC 4.3 (1995 Edition with the 1996 and 1997 Addenda) and ISTC-3600 (1998 Edition with the 1999 and 2000 Addenda). In addition, licensees who continue to implement Section XI of the ASME BPV Code as their Code of Record may use OMN-1 in lieu of the provisions for stroke-time testing specified in Paragraph 4.2.1 of ASME/ANSI OM Part 10 as required by 10 CFR 50.55a(b)(2)(vii) subject to the conditions in this Regulatory Guide (RG) 1.192. Licensees who choose to apply OMN-1 are required to apply all its provisions.

The relevant provisions are as follows:

(1) The adequacy of the diagnostic test interval for each motor-operated valve (MOV) must be evaluated and adjusted as necessary, but not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OMN-1.

(2) When extending exercise test intervals for high risk MOVs beyond a quarterly frequency, licensees must ensure that the potential increase in Core Damage Frequency (CDF) and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement.

(3) When applying risk insights as part of the implementation of OMN-1, licensees must categorize MOVs according to their safety significance using the methodology described in Code Case OMN-3, "Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants," with the conditions discussed in RG 1.192 or use other MOV risk ranking methodologies accepted by the NRC on a plant specific or industry-wide basis with the conditions in the applicable safety evaluations.

In addition, the following implementation clarifications are necessary:

- OMN-1, R 0, 3.1, *Design Basis Verification Test*, states that justifications for testing at conditions other than design bases conditions and for grouping like MOVs shall be documented by an engineering evaluation, alternative testing techniques, or both.

Design Basis Verification Testing was completed during plant startup testing and in response to NRC Generic Letter (GL) 89-10 testing requirements, which satisfies the requirement of OMN-1.

- OMN-1, R 0, 3.2, *Preservice Test*, states that each MOV shall be tested during the preservice test period or before implementing inservice testing.

  Preservice Testing was performed pursuant to NRC GL 89-10 testing requirements, which meet the intent of this requirement.

- OMN-1, R 0, 3.3 (b), *Inservice Test*, states that inservice tests shall be conducted in the as-found condition.

  Because of the extensive PVNGS MOV performance history, some as-found MOV testing can be waived by a documented engineering evaluation, e.g., if a modification to the valve or actuator will be performed or if valve maintenance is planned (such as valve repacking) and for activities that will require a post maintenance diagnostic test to return the MOV to service. This provision will not apply if there is reason to suspect the MOV is not operating properly prior to the maintenance activity.

- OMN-1, R 0, 3.3 (c), *Inservice Test*, states that the inservice testing program will include a mix of static and dynamic MOV performance testing.

  Dynamic testing will be performed to address MOV modifications.

  PVNGS performed differential pressure testing in accordance with NRC GL 89-10 and also participated in the Joint Owners Group (JOG) differential pressure testing program (i.e., dynamic testing) which has been completed. The mix of static and dynamic testing at PVNGS in the future will be static testing with additional dynamic testing performed as required by the PVNGS MOV Program to address MOV modifications.

- OMN-1, R 0, 3.3.1, *Inservice Test Frequency*, states that the inservice test frequency shall be determined in accordance with 6.4.4 or that testing shall be conducted every 2 refueling cycles or 3 years (whichever is longer) until sufficient data exist to determine a more appropriate test frequency not to exceed 10 years.

  Palo Verde has committed to the JOG program as part of its response to NRC GL 96-05. Inservice Test Intervals will be established based on MOV margin and the valve's risk/safety significance in accordance with JOG program requirements. PVNGS is currently implementing the JOG Interim Test Program in accordance with JOG Report MPR 1807. PVNGS will implement the final JOG Periodic Verification Program in accordance with JOG Report MPR 2524-A as noted in the NRC SER on the JOG program.

- OMN-1, R 0, 6.4.2.1, *Available Output Based on Motor Capabilities* and 6.4.2.2, *Available Output Based on Torque Switch Setting*, states that stem torque shall be determined.

  Palo Verde actuator output capabilities are determined as an integral part of the MOV design basis calculations and are not performed as part of the evaluation of MOV test data. The evaluation of test data compares actuator output to the acceptance band determined in design basis calculations. This applies to all actuators and includes those actuators setup based on limit switches.

  For actuators setup based on torque switches, available output includes torque measurement uncertainty (or displacement uncertainty if springpack displacement is used) and torque switch repeatability.

- OMN-1, R 0, 6.4.3, *Calculation of MOV Functional Margin*, states that MOV functional margin shall be calculated as the difference between the available stem torque and the required stem torque.

  Palo Verde calculates the margin as a percentage (vice difference in thrust or torque between available output and valve operating requirements).

- OMN-1, R 0, 6.4.4, Determination of MOV Test Interval, states that calculations for determining MOV functional margin shall also be evaluated to account for anticipated time-related changes in performance.

  As noted above for OMN-1, R 0, 3.3.1, the test interval is based on the NRC approved JOG program.

- OMN-1, R 0, 9.1, *Test Information*, states that test information shall be recorded or verified for MOV testing described in Section 3 and provides information that should be considered.

  Test Information relevant to the MOV being tested and relevant test parameters will be recorded electronically with the test trace and/or on the test data sheet. MOV configuration data not directly related to testing, e.g., name plate information, breaker setting, etc. are maintained in plant records.

Code Case OMN-1, R 0, should be considered acceptable for use with OM Code-2001 Edition w/2003 Addenda as the Code of record. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), PVNGS requests relief from the specific ISTC Code requirements identified in this relief request.

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The continued use of ASME Code Case OMN-1, Revision 0, as discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the third 10-year IST interval.

Precedents:

Relief Request VRR-01 was previously authorized for Palo Verde as Relief Request VRR-12 pursuant to 10 CFR 50.55a(a)(3)(i) for second interval in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

References:

NUREG-1482, Revision 1, Section 4.2.5, "Alternatives to Stroke-Time Testing"

Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code", Table 2, "Conditionally Acceptable OM Code Cases"

OM Code-2001 Edition w/2003 Addenda, Paragraph ISTC-5120, "Motor Operated Valves"

OM Code-2001 Edition w/2003 Addenda, Paragraph ISTA-3130, "Application of Code Cases"

Code Case OMN-1, Revision 0, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants"

ENCLOSURE 2

Information Copy of the Revised Third 10-Year Interval Pump and Valve Inservice Testing Program

PUMP AND VALVE INSERVICE TESTING PROGRAM AND COMPONENT TABLES	73DP-9XI01	Revision 21

Procedure Intent

This procedure identifies the pump and valve tests performed to meet the requirements of 10 CFR 50.55a, ASME/ANSI OM Code 2001 Edition w/2003 Addenda, and Technical Specification 5.5.8 for the Third 10-Year IST Interval.

Revision 20 Changes

- This revision represents a total re-write to reflect the requirements for the Third 10-Year IST Interval, effective 1/15/2008 through 1/14/2018.

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1.0 PROGRAM PURPOSE

Third 10-Year Interval IST Program Update.

This procedure identifies the pump and valve tests performed to meet the requirements of 10 CFR 50.55a, ASME/ANSI OM Code 2001 Edition w/2003 Addenda, and Technical Specification 5.5.8.

This program is applicable to PVNGS Units 1, 2, and 3. The pumps and valves within the scope of this program are identified in the component tables.

This program plan document provides the requirements for assessing the operational readiness of pumps and valves whose specific functions are required to bring the reactor from any operating mode to the safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

Palo Verde Nuclear Generating Station is licensed with a safe shutdown condition of Cold Shutdown.

The Inservice Testing Program for Pumps and Valves is applicable for a one hundred twenty (120) month interval. The chronology for Palo Verde Nuclear Generating Station is listed below:

- In 1995, PVNGS changed the 120-month intervals for the Unit 1, 2, and 3 IST programs in order to establish concurrent intervals. The change revised the end dates of the initial 120-month intervals and the start dates of the second 120-month intervals of all three units to a common date of January 15, 1997. The original schedules were based on the commercial operation dates of the units. This change was made to provide greater consistency between units and to simplify the 120-month updates required by 10 CFR 50.55a(f)(4)(ii).
- In 1997, the NRC granted a 1-Year Interval extension (to January 15, 1998) for all three units.
    1. The first 120-month interval for Unit 1 began on 1/28/1986, the commercial operating date, through 01/15/1998.
    2. The first 120-month interval for Unit 2 began on 9/22/1986, the commercial operating date, through 01/15/1998.
    3. The first 120-month interval for Unit 3 began on 1/08/1988, the commercial operating date, through 01/15/1998.
- The second 120-month interval IST Program for all three units began on 01/15/1998 and ends on 01/14/2008.

- The third 120-month interval IST Program for all three units begins on 01/15/2008 and ends on 01/14/2018.

The IST Program is submitted to the NRC for their overall review and specific approval of associated 10CFR50.55a Requests for the successive 120-month IST Program. The program documents submitted to the NRC are used to prepare for IST inspections and to review 10CFR50.55a Requests.

Regarding periodic changes, NUREG 1482, Revision 1, Section 2.6, "Program Documents," specifies that between a licensee's 10-year interval program submittal, the NRC would like to receive up-to-date program documents when the licensee makes significant changes to the IST program to facilitate these regulatory activities. As long as the IST program is consistent with the regulations, ASME Code relief is not required. That is, deletions from or additions to the IST program do not necessarily require NRC approval. The burden is on each licensee to verify that its IST program is complete and includes all components that require IST, and that all such components are tested to the extent practical. If a licensee deletes a particular component from its IST program, the staff recommends that the licensee should document the reason in an appropriate place. The staff expects each licensee to maintain its IST program up-to-date and ensure that it remains consistent with changes in plant configuration. If a particular relief request is no longer required because of changes in hardware, system design, or new technology, the licensee is expected to revise its program to withdraw the relief request. Conversely, if a system modification results in the addition of a component to the IST program, the licensee should ensure that it meets the Code requirements or the provisions of GL 89-04, or that a relief request is submitted for NRC review and approval, as appropriate.

This program plan document establishes the requirements which have been translated into implementing (surveillance) procedures for inservice testing and evaluation of Class 1, 2, and 3 pumps and valves. Additionally, using the guidance in NUREG 1482, Revision 1, certain other pumps and valves not required to be classified as Class 1, 2, and 3, but which perform a specific function required to bring the reactor from any operating mode to the safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident, are also included.

2.0 REGULATORY BASIS

Code of Federal Regulations, Title 10, Section 50.55a (10CFR50.55a), "Codes and Standards," states requirements for IST of certain safety-related pumps and valves. These components are required to be tested according to the requirements of Operation and Maintenance of Nuclear Power Plants, ASME OM Code-2001 Edition through the 2003 Addenda. The testing is intended to assess operational readiness of components. The tests conducted during the initial and successive 120-month intervals are to be based on the requirements in the applicable edition and addenda of the Code, to the extent

practical, within the limitations of design, geometry, and materials of construction, as described in 10 CFR50.55a(f)(4).

10 CFR50.55a(f)(4)(ii) requires that IST in each 120-month interval following the initial interval be conducted in compliance with the requirements of the latest edition and addenda of the Code incorporated by reference in 10CFR50.55a(b), in effect 12 months before the start of the interval. Pursuant to 10CFR50.55a(f)(4)(iv), IST may meet the requirements of subsequent editions and addenda incorporated by paragraph (b) or portions of a revised edition. When portions of a revised edition are used, all related requirements of the respective editions or addenda must be met and approval of the NRC obtained as clarified by RIS-04-012 dated 7/28/2004.

The NRC may authorize alternatives to Code testing requirements submitted as 10CFR50.55a requests, or submitted in a similar format that includes a description of the requirements, a description of the proposed alternative, and the justification for approval of the alternative. 10CFR50.55a(a)(3)(i) allows the NRC to authorize alternatives if the proposed alternatives would provide an acceptable level of quality and safety. The NRC will normally approve an alternative pursuant to this provision only if the licensee proposes a method of testing that is an equivalent method, or an improvement, to the Code method, or if the testing will comply or is consistent with the later Code editions approved by NRC in 10CFR50.55a(b). Where plant design makes the testing of certain components complicated or impossible, an alternate method of testing is documented in a 10CFR50.55a Request.

The Palo Verde Nuclear Generating Station (PVNGS) Inservice Testing Program for Pumps and Valves was developed in accordance with the requirements of ASME OM Code-2001, (Subsections ISTA, ISTB, ISTC, Mandatory Appendix I and Mandatory Appendix II) including subsequent changes in the ASME OMb Code-2003 Addenda.

The components were classified and categorized in accordance with the Code of Record with test requirements and intervals assigned accordingly. Technical Specification, UFSAR and other licensing commitments were referenced during the assignment of test intervals. Additional guidance for the development of the PVNGS Inservice Testing Program was obtained from NUREG 1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants."

The 10CFR50 Appendix J Program for Primary Containment Testing at Palo Verde Nuclear Generating Station is in compliance with the requirements of Option B of 10CFR50 Appendix J, Regulatory Guide 1.163, September 1995, NEI 94-01 Revision 0, July 1995 and Station Technical Specifications.

3.0 OM CODE CASE ACCEPTABILITY

3.1 ISTA-3130 Application of Code Cases

(a) Code Cases to be used during a preservice or inservice test or examination shall be identified in the test plan.

(b) Code Cases shall be applicable to the edition and addenda specified in the test plan.

(c) Code Cases shall be in effect at the time the test plan is filed, except as provided in ISTA-3130(d).

(d) Code Cases issued subsequent to filing the test plan may be proposed for use in amendments to the test plan.

3.2 NUREG 1482, Revision 1, Section 2.1.1, ASME Code Case Applicability

If a licensee would like to use an ASME Code Case with a Edition or Addendum of the ASME Code to which it is not applicable, the licensee has the following options:

a. Have the alternative to use the Code Case, beyond its stated applicability, authorized by the NRC pursuant to 10CFR50.55a(a)(3),

OR

b. If the Code Case is applicable to an Edition or Addendum of the ASME Code later than the version of the Code being used by the licensee, the licensee could update to the later version of the Code pursuant to 10CFR50.55a(f)(4)(iv) or (g)(4)(iv) and then use the Code Case, provided the Code Case has been approved for use in the appropriate Regulatory Guide and incorporated by reference into, 10CFR50.55a. Note that the later version of the ASME Code must also have been incorporated by reference into 10CFR50.55a, the licensee must update all related requirements of the respective Edition or Addenda; and the update must be specifically approved by the Commission.

Licensee should not use ASME Code Cases with Editions and Addenda of the ASME Code to which they do not apply and that are not specifically approved for use by the NRC. More specifically, licensees should not "reconcile" the Applicability of Code Cases without consulting with the applicable ASME Code Committee.

3.3 Regulatory Guide 1.192 Introduction and Discussion

Regulatory guide 1.192 identifies the Code Cases that have been determined by the NRC to be acceptable alternatives to applicable parts of the OM Code.

These Code Cases may be used by licensees, without request to the NRC, provided they are used with any identified limitations or modifications.

(SEE ABOVE OM ISTA-3130(b) REQUIREMENT; i.e., THE CODE CASE MUST BE APPLICABLE TO THE EDITION AND ADDENDA SPECIFIED IN THE TEST PLAN. PER NUREG 1482, AUTHORIZATION IS REQUIRED WHEN USING CODE CASES BEYOND THEIR STATED APPLICABILITY)

OM Code Cases not yet endorsed by the NRC may be implemented through 10CFR50.55a(a)(3), which permits the use of alternatives to the Code requirements referenced in 10CFR50.55a provided the proposed alternatives result in an acceptable level of quality and safety and provided their use is authorized by the Director of the Office of Nuclear Reactor Regulation.

Regulatory Guide 1.192, Appendix A lists the OM Code edition or addenda for each Code Case, with the date of approval by the ASME Board on Nuclear Codes and Standards. Appendix B is a numerical listing of the OM Code Cases.

Table 1, "Acceptable OM Code Cases," lists the Code Cases that are acceptable to the NRC for implementation in the IST of lightwater cooled nuclear power plants.

Table 2, "Conditionally Acceptable OM Code Cases," lists the Code Cases that are acceptable provided they are used with the identified limitations or modifications, i.e., the Code Case is generally acceptable but the NRC has determined that the alternative requirements must be supplemented in order to provide an acceptable level of quality and safety.

OM Code Cases that the NRC has determined to be unacceptable are listed in Regulatory Guide 1.193, "ASME Code Cases Not Approved for Use."

With regard to the use of any Code Case, it is the responsibility of the user to make certain that the provisions of the Code Case do not conflict with regulatory requirements or licensee commitments.

3.4 Code Cases Selected for use at Palo Verde

As documented in 10CFR50.55a Request VRR-01, as an alternative to the rules of OM Code ISTC to assess the operational readiness of certain electric motor-

operated valves, PVNGS adopts the alternative test requirements specified in Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants OM-1995, Subsection ISTC," including the associated additional requirements specified in RG 1.192.

4.0 PROGRAM DEVELOPMENT

The IST Program covers components in ASME Code Class systems and a limited number of Non-ASME Code Class systems. Components included in the IST Program are those whose specific functions are required to bring the reactor from any operating mode to the safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

ASME Class 1, 2 and 3 piping and components are identified on the PVNGS Piping and Instrument Diagrams (P&ID's). The P&ID's were reviewed to identify systems or portions of systems that are Code Class 1, 2, or 3. P&ID's containing Class 1, 2, or 3 plant pumps and valves or other pumps and valves with safety functions that require testing are identified in the Component Tables. Each Class 1, 2, and 3 component was reviewed to determine which require testing to satisfy the scope requirements of ASME OM Code-2001, including subsequent changes through the ASME OMb Code-2003 Addenda, Subsection ISTA, "General Requirements", Article ISTA-1000, "Introduction", Subarticle ISTA-1100,"Scope".

After all systems or portions of systems containing pumps and valves within the scope of the IST Program were identified, the safety function(s) for each component was determined. The safety function of each component is identified and documented in a computerized database. The references used in these determinations are also recorded and include the UFSAR, Technical Specifications, and other design basis documents. IST categories per ASME OM Code-2001, including subsequent changes through the ASME OMb Code-2003 Addenda are also identified. In cases where an interpretation of the ASME OM Code or applicable regulations was necessary, the interpretation was documented in a plant-specific Technical Position. These Technical Positions are documented in procedure 73DP-9XI02, "Pump and Valve Inservice Testing Program – Administrative Requirements."

Where the testing of certain plant components is not possible during normal plant operation, an alternate testing schedule is documented in a Cold Shutdown Justification. Where the testing of certain plant components is not possible during a cold shutdown, an alternate testing schedule is documented in a Refueling Outage Justification. Where plant design makes the testing of certain components complicated or impossible, an alternate method of testing is documented in a 10CFR50.55a Request.

Components failing to meet test requirements will be dispositioned by the Plant's Corrective Action program. Specific responsibilities are defined in the Plant procedures.

5.0 COMPONENT TABLES

The IST Program is comprised of component tables for pumps and valves followed by any associated code deviations referred to as Cold Shutdown Justifications, Refueling Outage Justifications and 10CFR50.55a Requests. Lastly, for ease of table and program interpretation, this document contains the table notes, pump table legend, valve table legend, accompanying definitions and associated abbreviations. This information is located at the end of the document.

6.0 REFERENCES

6.1 Implementing References

- 73DP-9XI02, "Pump and Valve Inservice Testing Program – Administrative Requirements"
- Surveillance test procedures as listed in the Pump Table and Valve Component Tables
- 73DP-9CL02, Containment Leakage Rate Testing Program
- 73DP-9XI05, Check Valve Condition Monitoring Program
- 73DP-0XI03, Check Valve Predictive Maintenance And Monitoring Program
- 39DP-9ZZ03, Motor-Operated Valve Program
- 73DP-9ZZ02, Air-Operated Valve Program
- 73TI-9XI01, Vibration Data Collection for Surveillance Tests

6.2 Developmental References

- Developmental references for the Pump and Valve IST Program are listed in 73DP-9XI02

Pump ID / Description	Pump Cat.	Code Class	Drawing Coord.	Speed	Press	Flow	Vib	Procedure	Remarks
AFA-P01 Essential Auxiliary Feedwater Pump (Turbine-Driven)	B Horiz. Cent. 8-Stage	3	AFP-001 D06	QTR 2YR	QTR 2YR	PRR-01 2YR	Not Required 2YR	73ST-9AF02 73ST-9AF04	Group B Min flow CPT - Full-flow test
AFB-P01 Essential Auxiliary Feedwater Pump (Motor-Driven)	B Horiz. Cent. 8-Stage	3	AFP-001 B06	NA NA	QTR 2YR	PRR-01 2YR	Not Required 2YR	73ST-9AF03 73ST-9AF05	Group B Min flow CPT - Full-flow test
AFN-P01 Non-Class Auxiliary Feedwater Pump (Motor-Driven)	N Horiz. Cent. 8-Stage	N	AFP-001 H06	NA	QTR	Not Measured Fixed Flow	QTR	73ST-9AF01	Augmented, tested pursuant to SR 3.7.5.2 No Comprehensive Test performed.
CHA-P01 Charging Pump	A 3-Cyl Pos. Displ.	2	CHP-002 B03	NA NA	QTR 2YR	QTR 2YR	PRR-06 2YR	73ST-9CH06 73ST-9CH02	Group A Test CPT - Full-flow test
CHB-P01 Charging Pump	A 3-Cyl Pos. Displ.	2	CHP-002 D03	NA NA	QTR 2YR	QTR 2YR	PRR-06 2YR	73ST-9CH06 73ST-9CH02	Group A Test CPT - Full-flow test
CHE-P01 Charging Pump	A 3-Cyl Pos. Displ.	2	CHP-002 G03	NA NA	QTR 2YR	QTR 2YR	PRR-06 2YR	73ST-9CH06 73ST-9CH02	Group A Test CPT - Full-flow test
CTA-P01 Condensate Transfer Pump	A Horiz. Cent. 1-Stage	3	CTP-001 C05	NA NA	QTR 2YR	QTR 2YR	QTR 2YR	73ST-9CT01 73ST-9CT02	Group A Test CPT - Full-flow test
CTB-P01 Condensate Transfer Pump	A Horiz. Cent. 1-Stage	3	CTP-001 B05	NA NA	QTR 2YR	QTR 2YR	QTR 2YR	73ST-9CT01 73ST-9CT02	Group A Test CPT - Full-flow test
DFA-P01 Diesel Generator Fuel Oil Transfer Pump	B Horiz. Cent. 1-Stage	3	DFP-001 B06	NA NA	QTR PRR-02	QTR 2YR	NA* NA*	73ST-9DF01 73ST-9DF02	Group B Test *Submerged - no accessible bearings. CPT - Full-flow test
DFB-P01 Diesel Generator Fuel Oil Transfer Pump	B Horiz. Cent. 1-Stage	3	DFP-001 B02	NA NA	QTR PRR-02	QTR 2YR	NA* NA*	73ST-9DF01 73ST-9DF02	Group B Test *Submerged - no accessible bearings CPT - Full-flow test
ECA-P01 Essential Chilled Water Circulation Pump	A Horiz. Cent. 1-Stage	3	ECP-001 B08	NA NA	QTR 2YR	QTR 2YR	QTR 2YR	73ST-9EC01 73ST-9EC02	Group A Test CPT - Full-flow test
ECB-P01 Essential Chilled Water Circulation Pump	A Horiz. Cent. 1-Stage	3	ECP-001 B04	NA NA	QTR 2YR	QTR 2YR	QTR 2YR	73ST-9EC01 73ST-9EC02	Group A Test CPT - Full-flow test

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Pump ID / Description	Pump Cat.	Code Class	Drawing Coord.	Speed	Press	Flow	Vib	Procedure	Remarks
EWA-P01 Essential Cooling Water Pump	A Horiz. Cent. 1-Stage	3	EWP-001 E06	NA	QTR	QTR	QTR	73ST-9EW01	Group A Test
				NA	2YR	2YR	2YR	73ST-9EW02	CPT - Full-flow test
EWB-P01 Essential Cooling Water Pump	A Horiz. Cent. 1-Stage	3	EWP-001 E02	NA	QTR	QTR	QTR	73ST-9EW01	Group A Test
				NA	2YR	2YR	2YR	73ST-9EW02	CPT - Full-flow test
PCA-P01 Spent Fuel Pool Cooling Pump	A Horiz. Cent. 1-Stage	3	PCP-001 D15	NA	QTR	QTR	QTR	73ST-9PC01	Group A Test
				NA	2YR	2YR	2YR	73ST-9PC02	CPT - Full-flow test
PCB-P01 Spent Fuel Pool Cooling Pump	A Horiz. Cent. 1-Stage	3	PCP-001 B15	NA	QTR	QTR	QTR	73ST-9PC01	Group A Test
				NA	2YR	2YR	2YR	73ST-9PC02	CPT - Full-flow test
SIA-P01 Low Pressure Safety Injection (LPSI) Pump	A Vert. Cent. 1-Stage	2	SIP-001 F11	NA	QTR	PRR-03	QTR	73ST-9SI11	Group A Test Min Flow
				NA	2YR	2YR	2YR	73ST-9SI14	CPT - Full-flow test
SIB-P01 Low Pressure Safety Injection (LPSI) Pump	A Vert. Cent. 1-Stage	2	SIP-001 B11	NA	QTR	PRR-03	QTR	73ST-9SI11	Group A Test Min Flow
				NA	2YR	2YR	2YR	73ST-9SI14	CPT - Full-flow test
SIA-P02 High Pressure Safety Injection (HPSI) Pump	B Horiz. Cent. 8-Stage	2	SIP-001 E11	NA	QTR	PRR-04	Not Required	73ST-9SI10	Group B Test Min Flow
				NA	2YR	2YR	2YR	73ST-9XI33	CPT - Full-flow test
SIB-P02 High Pressure Safety Injection (HPSI) Pump	B Horiz. Cent. 8-Stage	2	SIP-001 A11	NA	QTR	PRR-04	Not Required	73ST-9SI10	Group B Test Min Flow
				NA	2YR	2YR	2YR	73ST-9XI33	CPT - Full-flow test
SIA-P03 Containment Spray Pump	A Vert. Cent. 1-Stage	2	SIP-001 H11	NA	QTR	PRR-05	QTR	73ST-9SI06	Group A Test Min Flow
				NA	2YR	2YR	2YR	73ST-9SI15	CPT - Full-flow test
SIB-P03 Containment Spray Pump	A Vert. Cent. 1-Stage	2	SIP-001 C11	NA	QTR	PRR-05	QTR	73ST-9SI06	Group A Test Min Flow
				NA	2YR	2YR	2YR	73ST-9SI15	CPT - Full-flow test
SPA-P01 Essential Spray Pond Pump (Vert. Line Shaft)	A Vert. Line Shaft	3	SPP-001 Sh. 1 C04	NA	QTR	QTR	QTR	73ST-9SP01	Group A Test
					2YR	2YR	2YR	73ST-9SP02	CPT - Full-flow test
SPB-P01 Essential Spray Pond Pump (Vert. Line Shaft)	A Vert. Line Shaft	3	SPP-001 Sh. 1 C07	NA	QTR	QTR	QTR	73ST-9SP01	Group A Test
					2YR	2YR	2YR	73ST-9SP02	CPT - Full-flow test

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
AFAV007 TURBINE-DRIVEN AFW PUMP SUCTION CHECK VALVE FROM CONDENSATE STORAGE TANK	AFP-001 D07 3	8 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9AF04 73ST-9AF04		Notes 1, 2, 3, 4
AFAV015 TURBINE-DRIVEN AUXILIARY FEEDWATER PUMP DISCHARGE CHECK VALVE	AFP-001 E05 3	6 CK SA	C ACTIVE O/C	CVC CVO	QTR CSD	73ST-9AF02 73ST-9AF02	 CSJ-01	Notes 1, 2, 3
AFBV022 MOTOR-DRIVEN AFW PUMP SUCTION CHECK VALVE FROM CONDENSATE STORAGE TANK	AFP-001 C07 3	8 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9AF05 73ST-9AF05		Notes 1, 2, 3, 4
AFBV024 MOTOR-DRIVEN AUXILIARY FEEDWATER PUMP DISCHARGE CHECK VALVE	AFP-001 C05 3	6 CK SA	C ACTIVE O/C	CVC CVO	QTR CSD	73ST-9AF03 73ST-9AF05	 CSJ-01	Notes 1, 2, 3
AFBHV0030 MOTOR-DRIVEN AFW PUMP TO SG #1 FLOW CONTROL VALVE	AFP-001 B04 3	6 GL MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFBHV0031 MOTOR-DRIVEN AFW PUMP TO SG #2 FLOW CONTROL VALVE	AFP-001 B04 3	6 GL MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFAHV0032 TURBINE-DRIVEN AFW PUMP TO SG #1 FLOW CONTROL VALVE	AFP-001 D04 3	6 GL MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFCHV0033 TURBINE-DRIVEN AFW PUMP TO SG #2 FLOW CONTROL VALVE	AFP-001 C04 3	6 GL MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFBUV0034 MOTOR-DRIVEN AFW PUMP TO SG #1 ISOLATION VALVE (PEN. 75)	AFP-001 B03 2	6 GA MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFBUV0035 MOTOR-DRIVEN AFW PUMP TO SG #2 ISOLATION VALVE (PEN. 76)	AFP-001 C03 2	6 GA MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFCUV0036 TURBINE-DRIVEN AFW PUMP TO SG #1 ISOLATION VALVE (PEN. 75)	AFP-001 D03 2	6 GA MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFAUV0037 TURBINE-DRIVEN AFW PUMP TO SG #2 ISOLATION VALVE (PEN. 76)	AFP-001 D03 2	6 GA MO	B ACTIVE O/C	FSC FSO STC STO	QTR QTR 18M 18M	73ST-9XI05 73ST-9XI05 73ST-9XI05 73ST-9XI05	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
AFAHV0054 TURBINE-DRIVEN AFW PUMP TRIP/THROTTLE VALVE	AFP-001 G04 N	4 GL MO	B ACTIVE O	FSO	QTR	73ST-9AF02	VRR-01	Note 5 QTR FS FOR PRA/RA

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
AFAV079 AFW TO SG #1 CHECK VALVE (PEN. 75)	AFP-001 E02 2	6 CK SA	C ACTIVE O/C	CVC CVO	CSD CSD	73ST-9AF04 73ST-9AF04	 CSJ-02	Notes 1, 2, 3. Also exercised open in 73ST-9AF05.
AFBV080 AFW TO SG #2 CHECK VALVE (PEN. 76)	AFP-001 C02 2	6 CK SA	C ACTIVE O/C	CVC CVO	CSD CSD	73ST-9AF05 73ST-9AF05	 CSJ-02	Notes 1, 2, 3. Also exercised open in 73ST-9AF05.
AFAV096 AUX STEAM SUPPLY CHECK VALVE TO AFW TURBINE	AFP-001 G02 3	4 CK SA	C ACTIVE C	BDO CVC	CMP CMP	40OP-9AF01 73ST-9XI36		Notes 1, 2, 3, 4
AFBPSV0106 PRESSURE LOCKING RELIEF VALVE FOR AFBUV0034 BONNET(PEN. 75)	AFP-001 B03 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
AFBPSV0107 PRESSURE LOCKING RELIEF VALVE FOR AFBUV0035 BONNET (PEN. 76)	AFP-001 C03 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
AFAPSV0108 PRESSURE LOCKING RELIEF VALVE FOR AFCUV0036 BONNET (PEN. 75)	AFP-001 D03 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
AFAPSV0109 PRESSURE LOCKING RELIEF VALVE FOR AFAUV0037 BONNET (PEN. 76)	AFP-001 D03 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
AFAV137 TURBINE DRIVEN AFW PUMP DISCHARGE CHECK VALVE	AFP-001 D06 3	6 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9AF04 73ST-9AF04		Notes 1, 2, 3, 4
AFBV138 MOTOR DRIVEN AFW DISCHARGE CHECK VALVE	AFP-001 C06 3	6 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9AF05 73ST-9AF05		Notes 1, 2, 3, 4
CHEVM70 CHARGING TO REGENERATIVE HEAT EXCHANGER INLET INBOARD CIV (PEN. 41)	CHP-001 F15 2	3 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 73ST-9CH06		Notes 1, 2, 3, 4
CHNV144 MANUAL ISOLATION VALVE FROM RWT TO SPENT FUEL POOL CLEANUP PUMPS	CHP-002 B14 3	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
CHNV154 BORIC ACID MAKEUP PUMP DISCHARGE CHECK VALVE	CHP-002 B13 3	3 CK SA	C ACTIVE O	BDC CVO	CMP CMP	40ST-9CH04 40ST-9CH04		Notes 1, 2, 3, 4
CHNV155 BORIC ACID MAKEUP PUMP DISCHARGE CHECK VALVE	CHP-002 B13 3	3 CK SA	C ACTIVE O	BDC CVO	CMP CMP	40ST-9CH04 40ST-9CH04		Notes 1, 2, 3, 4
CHNV164 BORIC ACID MAKEUP FILTER BYPASS LINE ISOLATION VALVE	CHP-002 D11 3	3 DI MA	B ACTIVE O	FSO	2YR	73ST-9XI45		
CHAV177 BORIC ACID MAKEUP CHECK VALVE TO VCT OUTLET	CHP-002 B07 2	3 CK SA	C ACTIVE O	BDC CVO	CMP CMP	40ST-9CH04 40ST-9CH04		Notes 1, 2, 3, 4
CHAV190 RWT TO CHARGING PUMP SUCTION CHECK VALVE	CHP-002 A07 2	3 CK SA	C ACTIVE O	BDC CVO	CMP CMP	40ST-9CH04 40ST-9CH04		Notes 1, 2, 3, 4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
CHBHV0203 AUXILIARY PRESSURIZER SPRAY VALVE	CHP-001 H10 1	2 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI27	CSJ-03 CSJ-03 CSJ-03 CSJ-03 CSJ-03	Cycled every 18 months per TRM TSR 3.4.100.3
CHAHV0205 AUXILIARY PRESSURIZER SPRAY VALVE	CHP-001 H11 1	2 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI27	CSJ-03 CSJ-03 CSJ-03 CSJ-03 CSJ-03	Cycled every 18 months per TRM TSR 3.4.100.3
CHEHV0239 NORMAL CHARGING FLOWPATH ISOLATION VALVE	CHP-001 G11 2	2 GL AO	B ACTIVE O/C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHEPDV0240 NORMAL CHARGING FLOWPATH ISOLATION VALVE	CHP-001 G11 1	2 GL AO	B ACTIVE O/C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHBHV0255 RCP SEAL INJECTION OUTBOARD CIV (PEN. 72)	CHP-001 G04 2	1.5 GL MO	A ACTIVE C	AJ FSC	CLR 1CY	73ST-9CL01 73ST-9XI22	 VRR-01	Note 5
CHBV305 REFUELING WATER TANK OUTLET CHECK VALVE TO SI SUCTION HEADER	CHP-002 B15 2	20 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI39 73ST-9SI11		Notes 1, 2, 3, 4
CHAV306 REFUELING WATER TANK OUTLET CHECK VALVE TO SI SUCTION HEADER	CHP-002 C13 2	20 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI39 73ST-9SI11		Notes 1, 2, 3, 4
CHAPSV0315 CHARGING PUMP SUCTION PRESSURE RELIEF VALVE	CHP-002 C05 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
CHAV316 CHARGING PUMP CHA-P01 NORMAL SUCTION FROM VCT MANUAL ISOLATION VALVE	CHP-002 B05 2	4 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
CHBPSV0318 CHARGING PUMP SUCTION PRESSURE RELIEF VALVE	CHP-002 F05 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
CHBV319 CHARGING PUMP CHB-P01 NORMAL SUCTION FROM VCT MANUAL ISOLATION VALVE	CHP-002 D05 2	4 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
CHEPSV0321 CHARGING PUMP SUCTION PRESSURE RELIEF VALVE	CHP-002 H05 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
CHEV322 CHARGING PUMP CHE-P01 NORMAL SUCTION FROM VCT MANUAL ISOLATION VALVE	CHP-002 G05 2	4 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
CHEPSV0324 CHARGING PUMP DISCHARGE PRESSURE RELIEF VALVE	CHP-002 G02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
CHBPSV0325 CHARGING PUMP DISCHARGE PRESSURE RELIEF VALVE	CHP-002 E02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
CHAPSV0326 CHARGING PUMP DISCHARGE PRESSURE RELIEF VALVE	CHP-002 C02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
CHBV327 CHARGING PUMP ALTERNATE SUCTION COMMON ISOLATION VALVE	CHP-002 E05 2	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
CHAV328 CHARGING PUMP CHA-P01 DISCHARGE CHECK VALVE	CHP-002 B02 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CH06 73ST-9CH06		Notes 1, 2, 3
CHBV331 CHARGING PUMP CHB-P01 DISCHARGE CHECK VALVE	CHP-002 E02 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CH06 73ST-9CH06		Notes 1, 2, 3
CHEV334 CHARGING PUMP CHE-P01 DISCHARGE CHECK VALVE	CHP-002 G02 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CH06 73ST-9CH06		Notes 1, 2, 3
CHEV429 COMMON CHARGING LINE TO REGENERATIVE HEAT EXCHANGER CHECK VALVE	CHP-001 D16 2	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 40OP-90OP05		Notes 1, 2, 3, 4
CHEV431 PRESSURIZER AUXILIARY SPRAY CHECK VALVE	CHP-001 G09 1	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 73ST-9XI27		Notes 1, 2, 3, 4
CHEV433 CHARGING LINE CHECK VALVE TO RCS	CHP-001 G09 1	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 40OP-90OP05		Notes 1, 2, 3, 4
CHEV435 REGENERATIVE HEAT EXCHANGER OUTLET CHECK VALVE	CHP-001 F11 1	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 73ST-9CH06		Notes 1, 2, 3, 4
CHEV494 REACTOR MAKEUP WATER SUPPLY CHECK VALVE TO RDT INBOARD CIV (PEN. 45)	CHP-003 E15 2	1.5 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40OP-9CH01 73ST-9CL01		Notes 1, 2, 3, 4
CHNUV0501 VOLUME CONTROL TANK OUTLET ISOLATION VALVE	CHP-002 C07 2	4 GA MO	B ACTIVE C	FSC	1CY	73ST-9XI22	VRR-01	Note 5
CHBUV0505 REACTOR COOLANT SEAL BLEED-OFF OUTBOARD CIV (PEN. 43)	CHP-002 H13 2	1 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR RFO RFO RFO 2YR	73ST-9CL01 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22	 ROJ-02 ROJ-02 ROJ-02 	
CHAUV0506 REACTOR COOLANT SEAL BLEED-OFF INBOARD CIV (PEN. 43)	CHP-002 H14 2	1 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR RFO RFO RFO 2YR	73ST-9CL01 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22	 ROJ-02 ROJ-02 ROJ-02 	
CHNUV0514 BORIC ACID MAKEUP TO CHARGING PUMP SUCTION ISOLATION VALVE	CHP-002 B10 3	3 GL MO	B ACTIVE O	FSO	1CY	73ST-9XI06	VRR-01	Note 5

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
CHBUV0515 LETDOWN ISOLATION VALVE	CHP-001 H15 1	2 GL AO	B ACTIVE C	FSC FTC STC VP	CSD CSD CSD 2YR	73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22	CSJ-04 CSJ-04 CSJ-04	
CHAUV0516 LETDOWN INBOARD CIV (PEN. 40)	CHP-001 H15 1	2 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR CSD CSD CSD 2YR	73ST-9CL01 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22	 CSJ-04 CSJ-04 CSJ-04	
CHBUV0523 LETDOWN FROM REGENERATIVE HEAT EXCHANGER OUTBOARD CIV (PEN. 40)	CHP-001 F13 2	2 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR CSD CSD CSD 2YR	73ST-9CL01 73ST-9XI22 73ST-9XI22 73ST-9XI22 73ST-9XI22	 CSJ-04 CSJ-04 CSJ-04	
CHAHV0524 CHARGING LINE OUTBOARD CIV (PEN. 41)	CHP-001 D16 2	2 GL MO	B PASSIVE O	AJ	CLR	73ST-9CL01		Note 5 NO EXERCISE REQ'T - PASSIVE VALVE (NO PRA OR TS 3.3.5.4 REQ'TS FOR THIS MOV). Open w/power removed - no VP test required.
CHNUV0527 MAKEUP TO CHARGING VCT BYPASS ISOLATION VALVE	CHP-002 B08 3	3 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHBHV0530 REFUELING WATER TANK OUTLET ISOLATION VALVE	CHP-002 C15 2	20 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA
CHAHV0531 REFUELING WATER TANK OUTLET ISOLATION VALVE	CHP-002 C14 2	20 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA
CHEHV0532 ISOLATION FOR REFUELING WATER TANK TO BORIC ACID MAKEUP PUMPS	CHP-002 E16 2	3 GL AO	B ACTIVE O/C	FSC FSO VP	2YR 2YR 2YR	73ST-9XI22 73ST-9XI22 73ST-9XI22		Treated as a manual valve, air operator is not used for normal or emergency operation.
CHEHV0536 REFUELING WATER TANK TO CHARGING PUMP SUCTION ISOLATION VALVE	CHP-002 A14 3	3 GL MO	B ACTIVE O	FSO	1CY	73ST-9XI22	VRR-01	Note 5
CHAUV0560 REACTOR DRAIN TANK OUTLET INBOARD CIV (PEN. 44)	CHP-003 B15 2	3 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHBUV0561 REACTOR DRAIN TANK INBOARD CIV (PEN. 44)	CHP-003 A15 2	3 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHAUV0580 REACTOR MAKEUP WATER TO RDT OUTBOARD CIV (PEN. 45)	CHP-003 F14 2	1.5 GA AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
CHAUV0715 PASS TO RDT CIV (PEN. 45)	CHP-003 E13 2	0.5 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CHAV755 CHARGING PUMP CHA-P01 ALTERNATE SUCTION MANUAL ISOLATION VALVE	CHP-002 C05 2	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
CHBV756 CHARGING PUMP CHB-P01 ALTERNATE SUCTION MANUAL ISOLATION VALVE	CHP-002 D05 2	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
CHEV757 CHARGING PUMP CHE-P01 ALTERNATE SUCTION MANUAL ISOLATION VALVE	CHP-002 F05 2	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
CHNV835 RCP SEAL INJECTION SUPPLY LINE CHECK VALVE (PEN. 72)	CHP-001 G03 2	1.5 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40DP-9OP05 73ST-9CL01		Notes 1, 2, 3, 4
CHEV854 CHARGING LINE CHEMICAL ADDITION ISOLATION VALVE (PEN. 41)	CHP-001 E15 2	0.75 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
CHBUV0924 LETDOWN TO PASS CIV (PEN. 40)	CHP-001 E14 2	0.5 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
CPBUV0003A CONTAINMENT REFUELING PURGE SUPPLY INBOARD CIV (PEN. 56)	CPP-001 D05 2	42 BF MO	B ACTIVE C	FSC STC	RFO 18M	73ST-9XI23 73ST-9XI23	ROJ-01 VRR-01	Note 5 Note 6 18M STC REQ'D FOR TS 3.3.5.4
CPBUV0003B CONTAINMENT REFUELING PURGE EXHAUST OUTBOARD CIV (PEN. 57)	CPP-001 E02 2	42 BF MO	B ACTIVE C	FSC STC	RFO 18M	73ST-9XI23 73ST-9XI23	ROJ-01 VRR-01	Note 5 Note 6 18M STC REQ'D FOR TS 3.3.5.4
CPAUV0004A CONTAINMENT POWER ACCESS PURGE SUPPLY OUTBOARD CIV (PEN. 78)	CPP-001 D06 2	8 BF AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL07 73ST-9XI15 73ST-9XI15 73ST-9XI15 73ST-9XI15		
CPAUV0004B CONTAINMENT POWER ACCESS PURGE EXHAUST INBOARD CIV (PEN. 79)	CPP-001 D03 2	8 BF AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL07 73ST-9XI15 73ST-9XI15 73ST-9XI15 73ST-9XI15		
CPBUV0005A CONTAINMENT POWER ACCESS PURGE SUPPLY INBOARD CIV (PEN. 78)	CPP-001 D05 2	8 BF AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL07 73ST-9XI15 73ST-9XI15 73ST-9XI15 73ST-9XI15		
CPBUV0005B CONTAINMENT POWER ACCESS PURGE EXHAUST OUTBOARD CIV (PEN. 79)	CPP-001 C02 2	8 BF AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL07 73ST-9XI15 73ST-9XI15 73ST-9XI15 73ST-9XI15		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
CPAUV0002A CONTAINMENT REFUELING PURGE SUPPLY OUTBOARD CIV (PEN. 56)	CPP-001 D06 2	42 BF MO	B ACTIVE C	FSC STC	RFO 18M	73ST-9XI23 73ST-9XI23	ROJ-01 VRR-01	Note 5 Note 6 18M STC REQ'D FOR TS 3.3.5.4
CPAUV0002B CONTAINMENT REFUELING PURGE EXHAUST INBOARD CIV (PEN. 57)	CPP-001 E03 2	42 BF MO	B ACTIVE C	FSC STC	RFO 18M	73ST-9XI23 73ST-9XI23	ROJ-01 VRR-01	Note 5 Note 6 18M STC REQ'D FOR TS 3.3.5.4
CTAHV0001 AFN-P01 SUCTION ISOLATION VALVE FROM CONDENSATE STORAGE TANK	CTP-001 E02 3	10 BF MO	B ACTIVE C	FSC FSO	QTR QTR	73ST-9XI05 73ST-9XI05	VRR-01 VRR-01	The tests in the open direction are for an augmented function Note 5 QTR FS FOR PRA/RA.
CTAHV0004 AFN-P01 SUCTION ISOLATION VALVE FROM CONDENSATE STORAGE TANK	CTP-001 E03 3	10 BF MO	B ACTIVE C	FSC FSO	QTR QTR	73ST-9XI05 73ST-9XI05	VRR-01 VRR-01	The tests in the open direction are for an augmented function Note 5 QTR FS FOR PRA/RA.
CTAV016 CONDENSATE TRANSFER PUMP DISCHARGE CHECK VALVE	CTP-001 C04 3	3 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CT01 73ST-9CT01		Notes 1, 2, 3.
CTAV018 CONDENSATE TRANSFER TO SPENT FUEL POOL ISOLATION	CTP-001 C03 3	3 GA MA	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9CT01 73ST-9CT01		
CTBV019 CONDENSATE TRANSFER TO SPENT FUEL POOL ISOLATION	CTP-001 B03 3	3 GA MA	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9CT01 73ST-9CT01		
CTBV020 CONDENSATE TRANSFER PUMP DISCHARGE CHECK VALVE	CTP-001 B04 3	3 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CT01 73ST-9CT01		Notes 1, 2, 3.
CTAV037 CONDENSATE TRANSFER TO SPENT FUEL POOL CHECK VALVE	CTP-001 C04 3	3 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CT01 73ST-9CT01		Notes 1, 2, 3.
CTBV038 CONDENSATE TRANSFER TO SPENT FUEL POOL CHECK VALVE	CTP-001 B04 3	3 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9CT01 73ST-9CT01		Notes 1, 2, 3.
DFAV012 FUEL OIL TRANSFER PUMP DISCHARGE CHECK VALVE	DFP-001 D06 3	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9DF01 73ST-9DF01		Notes 1, 2, 3, 4
DFBV019 FUEL OIL TRANSFER PUMP DISCHARGE CHECK VALVE	DFP-001 D02 3	2 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9DF01 73ST-9DF01		Notes 1, 2, 3, 4
DFAV041 DIESEL FUEL OIL FILTER DP GAUGE MANUAL ISOLATION VALVE	DFP-001 H07 3	1 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
DFAV042 DIESEL FUEL OIL FILTER DP GAUGE MANUAL ISOLATION VALVE	DFP-001 G07 3	1 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
DFBV051 DIESEL FUEL OIL FILTER DP GAUGE MANUAL ISOLATION VALVE	DFP-001 H03 3	1 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
DFBV052 DIESEL FUEL OIL FILTER DP GAUGE MANUAL ISOLATION VALVE	DFP-001 G03 3	1 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
DGAPSV0005 EDG START AIR RECEIVER SAFETY RELIEF VALVE	DGP-001 sht 9 H06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
DGBPSV0006 EDG START AIR RECEIVER SAFETY RELIEF VALVE	DGP-001 sht 9 D06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
DGAPSV0007 EDG START AIR RECEIVER SAFETY RELIEF VALVE	DGP-001 sht 9 F06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
DGBPSV0008 EDG START AIR RECEIVER SAFETY RELIEF VALVE	DGP-001 sht 9 C03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
DGAV066 EDG STARTING AIR DRYER OUTLET CHECK VALVE	DGP-001 sht 9 F06 3	1 CK SA	C ACTIVE C	BDO CVC	QTR QTR	40ST-9DG01 73ST-9XI17		Notes 1, 2, 3. Required in all modes including shutdown.
DGAV067 EDG STARTING AIR DRYER OUTLET CHECK VALVE	DGP-001 sht 9 G06 3	1 CK SA	C ACTIVE C	BDO CVC	QTR QTR	40ST-9DG01 73ST-9XI17		Notes 1, 2, 3. Required in all modes including shutdown.
DGBV068 EDG STARTING AIR DRYER OUTLET CHECK VALVE	DGP-001 sht 9 D06 3	1 CK SA	C ACTIVE C	BDO CVC	QTR QTR	40ST-9DG02 73ST-9XI18		Notes 1, 2, 3. Required in all modes including shutdown.
DGBV069 EDG STARTING AIR DRYER OUTLET CHECK VALVE	DGP-001 sht 9 C06 3	1 CK SA	C ACTIVE C	BDO CVC	QTR QTR	40ST-9DG02 73ST-9XI18		Notes 1, 2, 3. Required in all modes including shutdown.
DWEV061 DW SUPPLY HEADER OUTSIDE CONTAINMENT ISOLATION VALVE (PEN. 6)	DWP-002 C03 2	2 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
DWEV062 DW SUPPLY HEADER INSIDE CONTAINMENT ISOLATION VALVE (PEN. 6)	DWP-002 C02 2	2 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
ECAV038 MAKEUP LINE CHECK VALVE FROM DW	ECP-001 D07 3	1.5 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECAV041 MAKEUP LINE CHECK VALVE FROM CT	ECP-001 C07 3	1.5 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECAV043 NITROGEN SUPPLY CHECK VALVE TO EC EXPANSION TANK	ECP-001 C07 3	1 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECBV060 MAKEUP LINE CHECK VALVE FROM DW	ECP-001 D03 3	1.5 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECBV064 NITROGEN SUPPLY CHECK VALVE TO EC EXPANSION TANK	ECP-001 C03 3	1 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECBV072 MAKEUP LINE CHECK VALVE FROM CT	ECP-001 D03 3	1.5 CK SA	C ACTIVE C	BDO CVC	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
ECAPSV0075 EC EXPANSION TANK RELIEF VALVE	ECP-001 D06 3	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
ECBPSV0076 EC EXPANSION TANK RELIEF VALVE	ECP-001 D03 3	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
ECAPSV0095 ESF SWITCHGEAR ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0096 ESF SWITCHGEAR ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E02 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
ECAPSV0097 CONTROL ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0098 CONTROL ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E04 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0099 WEST ELECTRICAL PENETRATION ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0100 EAST ELECTRICAL PENETRATION ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0101 EW PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0102 EW PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F02 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0103 CS PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0104 CS PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H04 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0105 HPSI PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0106 HPSI PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0107 LPSI PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0108 LPSI PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 H02 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0109 AFW PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F04 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0117 AFW PUMP ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 F05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECBPSV0120 DC EQUIPMENT ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
ECAPSV0121 DC EQUIPMENT ROOM ESSENTIAL ACU RELIEF VALVE	ECP-001 E06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWAPSV0047 SHUTDOWN HEAT EXCHANGER RELIEF VALVE	EWP-001 B07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWBPSV0048 SHUTDOWN HEAT EXCHANGER RELIEF VALVE	EWP-001 B03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
EWAPSV0061 ESSENTIAL CHILLER OUTLET LINE RELIEF VALVE	EWP-001 D07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWBPSV0062 ESSENTIAL CHILLER OUTLET LINE RELIEF VALVE	EWP-001 E03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWAUV0065 EW TO NUCLEAR COOLING WATER RETURN ISOLATION VALVE	EWP-001 C08 3	12 BF MO	B ACTIVE C	FSC STC	1CY 18M	73ST-9XI23 73ST-9XI23	VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
EWAHCV0067 FUEL POOL HEAT EXCHANGER RETURN ISOLATION VALVE	EWP-001 E08 3	10 BF MA	B PASSIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		Passive closed valve, exercising is augmented testing because of importance (but non-safety) to open.
EWBHCV0068 FUEL POOL HEAT EXCHANGER RETURN ISOLATION VALVE	EWP-001 E04 3	10 BF MA	B PASSIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		Passive closed valve, exercising is augmented testing because of importance (but non-safety) to open.
EWAPSV0079 ESSENTIAL CHILLED WATER HEAT EXCHANGER A PRESSURE RELIEF VALVE	EWP-001 F07 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWBPSV0080 ESSENTIAL CHILLED WATER HEAT EXCHANGER B PRESSURE RELIEF VALVE	EWP-001 F03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
EWAPSV0103 ESSENTIAL COOLING WATER SURGE TANK A PRESSURE RELIEF VALVE	EWP-001 H06 3	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
EWBPSV0104 ESSENTIAL COOLING WATER SURGE TANK B PRESSURE RELIEF VALVE	EWP-001 H02 3	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
EWAPSV0105 EW SURGE TANK VACUUM RELIEF VALVE	EWP-001 H06 3	2 VR SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
EWBPSV0106 EW SURGE TANK VACUUM RELIEF VALVE	EWP-001 H02 3	2 VR SA	C ACTIVE O/C	SP	10Y	73ST-9ZZ20		
EWAHCV0133 FUEL POOL HEAT EXCHANGER SUPPLY ISOLATION VALVE	EWP-001 D06 3	10 BF MA	B PASSIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		Passive closed valve, exercising is augmented testing because of importance (but non-safety) to open.
EWBHCV0134 FUEL POOL HEAT EXCHANGER SUPPLY ISOLATION VALVE	EWP-001 D02 3	10 BF MA	B PASSIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		Passive closed valve, exercising is augmented testing because of importance (but non-safety) to open.
EWAUV0145 EW TO NUCLEAR COOLING WATER SUPPLY ISOLATION VALVE	EWP-001 C04 3	12 BF MO	B ACTIVE C	FSC STC	1CY 18M	73ST-9XI23 73ST-9XI23	VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
EWAV234 EW SURGE TANK INSTRUMENTATION EXCESS FLOW CHECK VALVE MANUAL ISOLATION VALVE	EWP-001 G07 3	2 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
EWAV235 EW SURGE TANK INSTRUMENTATION EXCESS FLOW CHECK VALVE MANUAL ISOLATION VALVE	EWP-001 F07 3	2 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
EWBV238 EW SURGE TANK INSTRUMENTATION EXCESS FLOW CHECK VALVE MANUAL ISOLATION VALVE	EWP-001 G03 3	2 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
EWBV239 EW SURGE TANK INSTRUMENTATION EXCESS FLOW CHECK VALVE MANUAL ISOLATION VALVE	EWP-001 F03 3	2 GL MA	B ACTIVE C	FSC FSO	2YR 2YR	73ST-9XI45 73ST-9XI45		
FPEV089 FIRE WATER OUTSIDE CONTAINMENT ISOLATION VALVE (PEN. 7)	FPP-006 E08 2	6 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
FPEV090 FIRE WATER INSIDE CONTAINMENT ISOLATION VALVE (PEN. 7)	FPP-006 F09 2	6 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 14FT-9FP13		Notes 1, 2, 3, 4
GAAUV0001 HIGH PRESSURE NITROGEN SUPPLY HEADER OUTSIDE CIV (PEN. 30)	GAP-001 E07 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI07 73ST-9XI07 73ST-9XI07 73ST-9XI07		
GAAUV0002 LOW PRESSURE NITROGEN SUPPLY HEADER OUTSIDE CIV (PEN. 29)	GAP-001 F03 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI07 73ST-9XI07 73ST-9XI07 73ST-9XI07		
GAEV011 HIGH PRESSURE NITROGEN SUPPLY INSIDE CONTAINMENT ISOLATION CHECK VALVE (PEN. 30)	GAP-001 D06 2	1 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40ST-9ZZM1 73ST-9CL01		Notes 1, 2, 3, 4.
GAEV015 LOW PRESSURE NITROGEN SUPPLY INSIDE CONTAINMENT ISOLATION CHECK VALVE (PEN. 29)	GAP-001 E02 2	1 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40DP-9OP05 73ST-9CL01		Notes 1, 2, 3, 4
GRAUV0001 CONTAINMENT ISOLATION BETWEEN RDT AND GAS SURGE HEADER (PEN 52)	GRP-001 H07 2	1 GL MO	A ACTIVE C	AJ FSC STC	CLR QTR 18M	73ST-9CL01 73ST-9XI07 73ST-9XI07	 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
GRBUV0002 CONTAINMENT ISOLATION (SOV) BETWEEN RDT AND GAS SURGE HEADER (PEN 52)	GRP-001 H07 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI07 73ST-9XI07 73ST-9XI07 73ST-9XI07		
HCBUV0044 CONTAINMENT ATMOSPHERE RADIATION MONITOR INLET CIV (PEN 25A)	HCP-001 E03 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI40 73ST-9XI40 73ST-9XI40 73ST-9XI40		
HCAUV0045 CONTAINMENT ATMOSPHERE RADIATION MONITOR INLET CIV (PEN. 25A)	HCP-001 E02 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI40 73ST-9XI40 73ST-9XI40 73ST-9XI40		
HCAUV0046 CONTAINMENT ATMOSPHERE RADIATION MONITOR OUTLET CIV (PEN. 25B)	HCP-001 D02 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI40 73ST-9XI40 73ST-9XI40 73ST-9XI40		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
HCBUV0047 CONTAINMENT ATMOSPHERE RADIATION MONITOR OUTLET CIV (PEN. 25B)	HCP-001 D03 2	1 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI40 73ST-9XI40 73ST-9XI40 73ST-9XI40		
HCAHV0074 CONTAINMENT PRESSURE TRANSMITTER CIV (PEN. 54A)	HCP-001 D08 2	0.75 GL SO	B PASSIVE O	VP	2YR	73ST-9XI40		
HCBHV0075 CONTAINMENT PRESSURE TRANSMITTER CIV (PEN. 55A)	HCP-001 C02 2	0.75 GL SO	B PASSIVE O	VP	2YR	73ST-9XI40		
HCCHV0076 CONTAINMENT PRESSURE TRANSMITTER CIV (PEN. 32A)	HCP-001 C08 2	0.75 GL SO	B PASSIVE O	VP	2YR	73ST-9XI40		
HCDHV0077 CONTAINMENT PRESSURE TRANSMITTER CIV (PEN. 62A)	HCP-001 C02 2	0.75 GL SO	B PASSIVE O	VP	2YR	73ST-9XI40		
HPAUV0001 H2 CONTROL SYSTEM SUPPLY FROM CONTAINMENT INBOARD CIV (PEN. 35)	HPP-001 E15 2	2 GL MO	A ACTIVE O/C	AJ FSC FSO STC STO	CLR 1CY 1CY 18M 18M	73ST-9CL01 73ST-9XI08 73ST-9XI08 73ST-9XI08 73ST-9XI08	 VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
HPAV002 H2 CONTROL SYSTEM RETURN LINE TO CONTAINMENT INBOARD CIV (PEN. 38)	HPP-001 F15 2	2 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 73ST-9CL01		Notes 1, 2, 3, 4
HPBUV0002 H2 CONTROL SYSTEM SUPPLY FROM CONTAINMENT INBOARD CIV (PEN. 36)	HPP-001 C15 2	2 GL MO	A ACTIVE O/C	AJ FSC FSO STC STO	CLR 1CY 1CY 18M 18M	73ST-9CL01 73ST-9XI08 73ST-9XI08 73ST-9XI08 73ST-9XI08	 VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
HPAUV0003 H2 CONTROL SYSTEM SUPPLY FROM CONTAINMENT OUTBOARD CIV (PEN. 35)	HPP-001 E14 2	2 GL MO	A ACTIVE O/C	AJ FSC FSO STC STO	CLR 1CY 1CY 18M 18M	73ST-9CL01 73ST-9XI08 73ST-9XI08 73ST-9XI08 73ST-9XI08	 VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
HPBUV0004 H2 CONTROL SYSTEM SUPPLY FROM CONTAINMENT OUTBOARD CIV (PEN. 36)	HPP-001 C14 2	2 GL MO	A ACTIVE O/C	AJ FSC FSO STC STO	CLR 1CY 1CY 18M 18M	73ST-9CL01 73ST-9XI08 73ST-9XI08 73ST-9XI08 73ST-9XI08	 VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
HPBV004 H2 CONTROL SYSTEM RETURN LINE TO CONTAINMENT INBOARD CIV (PEN. 39)	HPP-001 C15 2	2 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 73ST-9CL01		Notes 1, 2, 3, 4
HPAUV0005 H2 CONTROL SYSTEM RETURN TO CONTAINMENT OUTBOARD CIV (PEN 38)	HPP-001 E14 2	2 GL MO	A ACTIVE O/C	AJ FSC FSO STC STO	CLR 1CY 1CY 18M 18M	73ST-9CL01 73ST-9XI08 73ST-9XI08 73ST-9XI08 73ST-9XI08	 VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
HPBUV0006 H2 CONTROL SYSTEM RETURN TO CONTAINMENT OUTBOARD CIV (PEN. 39)	HPP-001 C14 2	2 GL MO	A ACTIVE O/C	AJ	CLR	73ST-9CL01		Note 5 18M ST FOR TS 3.3.5.4
				FSC	1CY	73ST-9XI08	VRR-01	
				FSO	1CY	73ST-9XI08	VRR-01	
				STC	18M	73ST-9XI08	VRR-01	
				STO	18M	73ST-9XI08	VRR-01	
HPAHV0007A POST-LOCA H2 MONITOR INLET CIV (PEN. 35)	HPP-001 F14 2	1 GL SO	A ACTIVE O/C	AJ	CLR	73ST-9CL01		
				FSC	QTR	73ST-9XI08		
				FSO	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				STO	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
HPAHV0007B POST-LOCA H2 MONITOR OUTLET CIV (PEN. 38)	HPP-001 G14 2	1 GL SO	A ACTIVE O/C	AJ	CLR	73ST-9CL01		
				FSC	QTR	73ST-9XI08		
				FSO	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				STO	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
HPBHV0008A POST-LOCA H2 MONITOR INLET CIV (PEN. 36)	HPP-001 C13 2	1 GL SO	A ACTIVE O/C	AJ	CLR	73ST-9CL01		
				FSC	QTR	73ST-9XI08		
				FSO	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				STO	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
HPBHV0008B POST-LOCA H2 MONITOR OUTLET CIV (PEN. 39)	HPP-001 B14 2	1 GL SO	A ACTIVE O/C	AJ	CLR	73ST-9CL01		
				FSC	QTR	73ST-9XI08		
				FSO	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				STO	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
HPAUV0023 CONTAINMENT H2 MONITORING SYSTEM RETURN FROM PASS OUTBOARD CIV (PEN. 38)	HPP-001 G14 2	0.5 GL SO	A ACTIVE C	AJ	CLR	73ST-9CL01		Valve size is 1" in Units 2 and 3.
				FSC	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
HPAUV0024 CONTAINMENT H2 MONITORING SYSTEM TO PASS CIV (PEN. 35)	HPP-001 F12 2	0.5 GL SO	A ACTIVE C	AJ	CLR	73ST-9CL01		Valve size is 1" in Units 2 and 3
				FSC	QTR	73ST-9XI08		
				FTC	QTR	73ST-9XI08		
				STC	QTR	73ST-9XI08		
				VP	2YR	73ST-9XI08		
IAAUV0002 INSTRUMENT AIR SUPPLY OUTSIDE CONTAINMENT ISOLATION VALVE (PEN. 31)	IAP-003 G07 2	2 GL SO	A ACTIVE C	AJ	CLR	73ST-9CL01		
				FSC	CSD	73ST-9XI23	CSJ-06	
				FTC	CSD	73ST-9XI23	CSJ-06	
				STC	CSD	73ST-9XI23	CSJ-06	
				VP	2YR	73ST-9XI23		

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
IAEV021 INSTRUMENT AIR SUPPLY INSIDE CONTAINMENT ISOLATION VALVE (PEN. 31)	IAP-003 G05 2	2 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40DP-9OP05 73ST-9CL01		Notes 1, 2, 3, 4
IAEV072 BREATHING AIR CONTAINMENT ISOLATION VALVE (PEN. 59)	IAP-002 G09 2	3 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
IAEV073 BREATHING AIR SUPPLY INSIDE CONTAINMENT ISOLATION VALVE (PEN. 59)	IAP-002 H07 2	3 CK SA	AC PASSIVE C	AJ	CLR	73ST-9CL01		Notes 1, 2, 3
NCEV118 NUCLEAR COOLING WATER SUPPLY TO RCP COOLER INBOARD CIV (PEN. 33)	NCP-003 E06 2	10 CK SA	AC ACTIVE C	AJ BDO CVC	CLR CMP CMP	73ST-9CL01 40DP-9OP05 73ST-9CL01		Notes 1, 2, 3, 4
NCAHCV0244 NUCLEAR COOLING WATER TO SPENT FUEL POOL HEAT EXCHANGER ISOLATION VALVE	NCP-002 B04 3	10 BF MA	B ACTIVE C	FSC	2YR	73ST-9XI44		Augmented
NCBHCV0245 NUCLEAR COOLING WATER TO SPENT FUEL POOL HEAT EXCHANGER ISOLATION VALVE	NCP-002 B04 3	10 BF MA	B ACTIVE C	FSC	2YR	73ST-9XI45		Augmented
NCAPSV0250 FUEL POOL COOLING HEAT EXCHANGER RELIEF VALVE	NCP-002 E02 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
NCBPSV0251 FUEL POOL COOLING HEAT EXCHANGER RELIEF VALVE	NCP-002 D02 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
NCAHCV0258 NUCLEAR COOLING WATER TO SPENT FUEL POOL HEAT EXCHANGER ISOLATION VALVE	NCP-002 C04 3	10 BF MA	B ACTIVE C	FSC	2YR	73ST-9XI44		Augmented
NCBHCV0259 NUCLEAR COOLING WATER TO SPENT FUEL POOL HEAT EXCHANGER ISOLATION VALVE	NCP-002 B04 3	10 BF MA	B ACTIVE C	FSC	2YR	73ST-9XI45		Augmented
NCBUV0401 NUCLEAR COOLING WATER SUPPLY TO RCP COOLER OUTBOARD CIV (PEN. 33)	NCP-003 E07 2	10 BF MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI23 73ST-9XI23	 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
NCAUV0402 NUCLEAR COOLING WATER SUPPLY TO RCP COOLER OUTBOARD CIV (PEN. 34)	NCP-003 F07 2	10 BF MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI23 73ST-9XI23	 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
NCBUV0403 NUCLEAR COOLING WATER SUPPLY TO RCP COOLER INBOARD CIV (PEN. 34)	NCP-003 F06 2	10 BF MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI23 73ST-9XI23	 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
NCEPSV0614 NC CONTAINMENT ISOLATION VALVE RELIEF VALVE	NCP-003 E05 N	6 SV SA	C ACTIVE O	SV	10Y	73ST-9ZZ20		Augmented
NCEPSV0615 NC CONTAINMENT ISOLATION VALVE RELIEF VALVE	NCP-003 E05 N	6 SV SA	C ACTIVE O	SV	10Y	73ST-9ZZ20		Augmented
NCEPSV0617 NC CONTAINMENT PENETRATION RELIEF VALVE (PEN 34)	NCP-003 E07 2	0.75 SV SA	AC ACTIVE O/C	AJ SV	CLR 10Y	73ST-9CL01 73ST-9ZZ20		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
PCAV013 SPENT FUEL POOL COOLING PUMP DISCHARGE CHECK VALVE	PCP-001 D15 3	8 CK SA	C ACTIVE O/C	CVC CVO	QTR QTR	73ST-9PC01 73ST-9PC01		Notes 1, 2, 3. Augmented.
PCBV017 SPENT FUEL POOL COOLING PUMP DISCHARGE CHECK VALVE	PCP-001 B15 3	8 CK SA	C ACTIVE O/C	CVC CVO	QTR QTR	73ST-9PC01 73ST-9PC01		Notes 1, 2, 3. Augmented.
PCAPSV0035 SPENT FUEL POOL COOLING HEAT EXCHANGER PRESSURE RELIEF VALVE	PCP-001 E13 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
PCBPSV0036 SPENT FUEL POOL COOLING HEAT EXCHANGER PRESSURE RELIEF VALVE	PCP-001 B13 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Augmented
PCEV070 REFUELING POOL PURIFICATION RETURN CONTAINMENT ISOLATION VALVE (PEN 50)	PCP-001 E10 2	4 GA MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
PCEV071 REFUELING POOL PURIFICATION RETURN CONTAINMENT ISOLATION VALVE (PEN 50)	PCP-001 E09 2	4 GA MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
PCEV075 REFUELING POOL PURIFICATION SUPPLY CONTAINMENT ISOLATION VALVE (PEN 51)	PCP-001 G06 2	4 GA MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
PCEV076 REFUELING POOL PURIFICATION SUPPLY CONTAINMENT ISOLATION VALVE (PEN 51)	PCP-001 G05 2	4 GA MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
PCNV215 RWT TO SPENT FUEL POOL MANUAL ISOLATION VALVE	CHP-002 A11 3	3 DI MA	B ACTIVE O/C	FSC FSO	2YR 2YR	73ST-9XI44 73ST-9XI44		
RCAHV0101 REACTOR VESSEL HEAD VENT VALVE	RCP-001 G15 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCBHV0102 REACTOR VESSEL HEAD VENT VALVE	RCP-001 G15 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCAHV0103 PRESSURIZER VENT VALVE	RCP-001 G14 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
RCBHV0105 PRESSURIZER/REACTOR VESSEL HEAD VENT VALVE TO REACTOR DRAIN TANK	RCP-001 G13 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCAHV0106 PRESSURIZER/REACTOR VESSEL HEAD VENT VALVE TO CONTAINMENT	RCP-001 G13 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCBHV0108 PRESSURIZER VENT VALVE	RCP-001 G13 1	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCBHV0109 PRESSURIZER VENT VALVE	RCP-001 G13 1	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24 73ST-9XI24	CSJ-07 CSJ-07 CSJ-07 CSJ-07 CSJ-07	
RCEPSV0200 PRESSURIZER SAFETY VALVE	RCP-001 F12 1	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 040634)
RCEPSV0201 PRESSURIZER SAFETY VALVE	RCP-001 F12 1	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 040634)
RCEPSV0202 PRESSURIZER SAFETY VALVE	RCP-001 F12 1	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 040634)
RCEPSV0203 PRESSURIZER SAFETY VALVE	RCP-001 F12 1	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 040634)
RDAV020 CONTAINMENT SPRAY PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 2 B14 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDAV021 HPSI PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 2 B05 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDAV022 LPSI PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 2 B14 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDAUV0023 CONTAINMENT RADWASTE SUMP OUTLET INBOARD CIV (PEN. 9)	RDP-001 G04 2	3 GA MO	A ACTIVE C	AJ FSC STC	CLR QTR 18M	73ST-9CL01 73ST-9XI07 73ST-9XI07	 VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
RDBUV0024 CONTAINMENT RADWASTE SUMP OUTLET OUTBOARD CIV (PEN. 9)	RDP-001 G04 2	3 GA AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI07 73ST-9XI07 73ST-9XI07 73ST-9XI07		
RDBV040 CONTAINMENT SPRAY PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 3 B05 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDBV041 HPSI PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 3 B05 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDBV042 LPSI PUMP ROOM FLOOR DRAIN CHECK VALVE TO ESF SUMP	RDP-002 sht 3 B05 3	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
RDAV203 AUXILIARY FEEDWATER PUMP ROOM TRAIN A FLOOR DRAIN CHECK VALVE TO NON-ESF SUMP	RDP-002 sht 3 G04 N	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Disassembly and Inspection
RDBV204 AUXILIARY FEEDWATER PUMP ROOM TRAIN B FLOOR DRAIN CHECK VALVE TO NON-ESF SUMP	RDP-002 sht 3 F03 N	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Disassembly and Inspection
RDBUV0407 CONTAINMENT RADWASTE SUMP OUTLET TO POST ACCIDENT SAMPLING CIV (PEN. 9)	RDP-001 G04 2	0.5 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI07 73ST-9XI07 73ST-9XI07 73ST-9XI07		
SGEV003 ECONOMIZER FEEDWATER LINE CHECK VALVE (PEN. 8)	SGP-002 E10 2	24 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEV005 ECONOMIZER FEEDWATER LINE CHECK VALVE (PEN. 10)	SGP-002 A10 2	24 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEV006 ECONOMIZER FEEDWATER LINE CHECK VALVE (PEN. 10)	SGP-002 A10 2	24 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEV007 ECONOMIZER FEEDWATER LINE CHECK VALVE (PEN. 8)	SGP-002 E10 2	24 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEVA19 MSIV 170 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA20 MSIV 170 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA21 MSIV 180 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA22 MSIV 180 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGEVA23 MSIV 171 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA24 MSIV 171 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA25 MSIV 181 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGEVA26 MSIV 181 INSTRUMENT AIR CHECK VALVE	VM M234A-14 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01		Notes 1, 2, 3, 4
SGAVA27 ECONOMIZER FWIV 174 INSTRUMENT AIR CHECK VALVE	VM M234A-55 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16		Notes 1, 2, 3, 4
SGAVA28 ECONOMIZER FWIV 177 INSTRUMENT AIR CHECK VALVE	VM M234A-55 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16		Notes 1, 2, 3, 4
SGBVA29 ECONOMIZER FWIV 132 INSTRUMENT AIR CHECK VALVE	VM M234A-55 NA 2	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16		Notes 1, 2, 3, 4
SGBVA30 ECONOMIZER FWIV 137 INSTRUMENT AIR CHECK VALVE	VM M234A-55 NA	0.5 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16		Notes 1, 2, 3, 4
SGAV043 STEAM SUPPLY CHECK VALVE TO TURBINE-DRIVEN AFW PUMP	SGP-001 sht 1 E12 3	6 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9AF04 73ST-9AF04		Notes 1, 2, 3, 4
SGAV044 STEAM SUPPLY CHECK VALVE TO TURBINE-DRIVEN AFW PUMP	SGP-001 sht 1 C12 3	6 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9AF04 73ST-9AF04		Notes 1, 2, 3, 4
SGBUV0130 SG 1 DOWNCOMER FEEDWATER DOWNSTREAM ISOLATION VALVE (PEN. 11)	SGP-002 G11 2	8 GA AO	B ACTIVE C	FSC FTC STC VP	CSD CSD CSD 2YR	73ST-9XI19 73ST-9XI19 73ST-9XI19 73ST-9XI19	CSJ-08 CSJ-08 CSJ-08	Fails closed on loss of air.
SGBUV0132 SG 1 ECONOMIZER FEEDWATER DOWNSTREAM ISOLATION VALVE (PEN. 8)	SGP-002 E12 2	24 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16	CSJ-08 CSJ-08 CSJ-08	PSC is an Augmented Test (see CSJ-08)
SGAUV0134 SG 1 STEAM SUPPLY TO AUX FEED PUMP TURBINE ISOLATION VALVE (PEN. 2)	SGP-001 sht 1 E14 2	6 GA MO	B ACTIVE O/C	FSC FSO LT STC STO	QTR QTR RFO 18M 18M	73ST-9AF02 73ST-9AF02 73ST-9XI34 73ST-9AF02 73ST-9AF02	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 Leakage test is "Augmented" requirement. QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGBUV0134A TDAFW PUMP STEAM SUPPLY WARM-UP LINE ISOLATION VALVE (PEN.2)	SGP-001 sht 1 E13 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC LT STC STO VP	QTR QTR QTR RFO QTR QTR 2YR	73ST-9AF02 73ST-9AF02 73ST-9AF02 73ST-9XI34 73ST-9AF02 73ST-9AF02 73ST-9AF02		Leakage test is "Augmented" requirement.
SGBUV0135 SG 2 DOWNCOMER FEEDWATER DOWNSTREAM ISOLATION VALVE (PEN. 12)	SGP-002 C11 2	8 GA AO	B ACTIVE C	FSC FTC STC VP	CSD CSD CSD 2YR	73ST-9XI19 73ST-9XI19 73ST-9XI19 73ST-9XI19	CSJ-08 CSJ-08 CSJ-08	Fails closed on loss of air only
SGBUV0137 SG 2 ECONOMIZER FEEDWATER DOWNSTREAM ISOLATION VALVE (PEN. 10)	SGP-002 A12 2	24 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16	CSJ-08 CSJ-08 CSJ-08	PSC is an Augmented Test (see CSJ-08)
SGAUV0138 SG 2 STEAM SUPPLY TO AUX FEED PUMP TURBINE ISOLATION VALVE (PEN. 3)	SGP-001 sht 1 C13 2	6 GA MO	B ACTIVE O/C	FSC FSO LT STC STO	QTR QTR RFO 18M 18M	73ST-9AF02 73ST-9AF02 73ST-9XI34 73ST-9AF02 73ST-9AF02	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 Leakage test is "Augmented" requirement. QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SGAUV0138A TDAFW PUMP STEAM SUPPLY WARM-UP LINE ISOLATION VALVE (PEN. 3)	SGP-001 sht 1 C14 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC LT STC STO VP	QTR QTR QTR RFO QTR QTR 2YR	73ST-9AF02 73ST-9AF02 73ST-9AF02 73ST-9XI34 73ST-9AF02 73ST-9AF02 73ST-9AF02		Leakage test is "Augmented" requirement.
SGEUV0169 MSIV BYPASS VALVE (PEN. 2)	SGP-001 sht 1 D11 2	4 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGEUV0170 MAIN STEAM ISOLATION VALVE (PEN. 1)	SGP-001 sht 1 G10 2	28 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01	CSJ-09 CSJ-09 CSJ-09	PSC is an Augmented Test (see CSJ-09)
SGEUV0171 MAIN STEAM ISOLATION VALVE (PEN. 3)	SGP-001 sht 1 D10 2	28 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01	CSJ-09 CSJ-09 CSJ-09	PSC is an Augmented Test (see CSJ-09)
SGAUV0172 SG 1 DOWNCOMER FEEDWATER UPSTREAM ISOLATION VALVE (PEN. 11)	SGP-002 G12 2	8 GA AO	B ACTIVE C	FSC FTC STC VP	CSD CSD CSD 2YR	73ST-9XI19 73ST-9XI19 73ST-9XI19 73ST-9XI19	CSJ-08 CSJ-08 CSJ-08	Fails closed on loss of air only

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGAUV0174 SG 1 ECONOMIZER FEEDWATER UPSTREAM ISOLATION VALVE (PEN. 8)	SGP-002 E12 2	24 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16	CSJ-08 CSJ-08 CSJ-08 	PSC is an Augmented Test (see CSJ-08)
SGAUV0175 SG 2 DOWNCOMER FEEDWATER UPSTREAM ISOLATION VALVE (PEN. 12)	SGP-002 C12 2	8 GA AO	B ACTIVE C	FSC FTC STC VP	CSD CSD CSD 2YR	73ST-9XI19 73ST-9XI19 73ST-9XI19 73ST-9XI19	CSJ-08 CSJ-08 CSJ-08 	Fails closed on loss of air only
SGAUV0177 SG 2 ECONOMIZER FEEDWATER UPSTREAM ISOLATION VALVE (PEN. 10)	SGP-002 A12 2	24 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16 73ST-9XI16	CSJ-08 CSJ-08 CSJ-08 	PSC is an Augmented Test (see CSJ-08)
SGBHV0178 STEAM GENERATOR ATMOSPHERIC DUMP VALVE (ADV) (PEN. 2)	SGP-001 sht 2 E02 2	12 GL AO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20		
SGAHV0179 STEAM GENERATOR ATMOSPHERIC DUMP VALVE (ADV) (PEN. 4)	SGP-001 sht 2 B02 2	12 GL AO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20		
SGEUV0180 MAIN STEAM ISOLATION VALVE (PEN. 2)	SGP-001 sht 1 F10 2	28 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01	CSJ-09 CSJ-09 CSJ-09 	PSC is an Augmented Test (see CSJ-09)
SGEUV0181 MAIN STEAM ISOLATION VALVE (PEN. 4)	SGP-001 sht 1 B10 2	28 GA HY	B ACTIVE C	FSC FTC PSC STC VP	CSD CSD QTR CSD 2YR	73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01 73ST-9SG01	CSJ-09 CSJ-09 CSJ-09 	PSC is an Augmented Test (see CSJ-09)
SGEUV0183 MSIV BYPASS VALVE (PEN. 3)	SGP-001 sht 1 C11 2	4 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGAHV0184 STEAM GENERATOR ATMOSPHERIC DUMP VALVE (ADV) (PEN. 1)	SGP-001 sht 2 G02 2	12 GL AO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGBHV0185 STEAM GENERATOR ATMOSPHERIC DUMP VALVE (ADV) (PEN. 3)	SGP-001 sht 2 D02 2	12 GL AO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20 73ST-9XI20		
SGBHV0200 CHEMICAL INJECTION ISOLATION VALVE (PEN. 11)	SGP-002 F11 2	0.375 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBHV0201 CHEMICAL INJECTION ISOLATION VALVE (PEN. 12)	SGP-002 B11 2	0.375 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGAUV0204 SG 1 HOT LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 37B)	SGP-002 F03 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGAUV0211 SG 1 COLD LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 37A)	SGP-002 G03 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBUV0219 SG 1 HOT LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 37B)	SGP-002 G03 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGAUV0220 SG 1 DOWNCOMER BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 49)	SGP-002 G06 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBUV0221 SG 1 DOWNCOMER BLOWDOWN SAMPLE LINE ISOLATION VALVE PEN. 49)	SGP-002 G05 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBUV0222 SG 2 COLD LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 63B)	SGP-002 C04 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGAUV0223 SG 2 COLD LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 63B)	SGP-002 C03 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGBUV0224 SG 2 HOT LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 63A)	SGP-002 D04 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGAUV0225 SG 2 HOT LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 63A)	SGP-002 D02 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGBUV0226 SG 2 DOWNCOMER BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 48)	SGP-002 C05 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGAUV0227 SG 2 DOWNCOMER BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 48)	SGP-002 C05 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGBUV0228 SG 1 COLD LEG BLOWDOWN SAMPLE LINE ISOLATION VALVE (PEN. 37A)	SGP-002 G03 2	0.5 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBPSV0302 ADV SGBHV178 NITROGEN ACCUMULATOR PRESSURE RELIEF VALVE	SGP-001 sht 2 F06 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGBPSV0305 ADV SGBHV178 NITROGEN SUPPLY PRESSURE RELIEF VALVE	SGP-001 sht 2 F05 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGAPSV0309 ADV SGAHV179 NITROGEN ACCUMULATOR PRESSURE RELIEF VALVE	SGP-001 sht 2 C06 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGAPSV0312 ADV SGAHV179 NITROGEN SUPPLY PRESSURE RELIEF VALVE	SGP-001 sht 2 C05 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGAPSV0316 ADV SGAHV184 NITROGEN ACCUMULATOR PRESSURE RELIEF VALVE	SGP-001 sht 2 H06 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGAPSV0319 ADV SGAHV184 NITROGEN SUPPLY PRESSURE RELIEF VALVE	SGP-001 sht 2 H05 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGBPSV0322 ADV SGBHV185 NITROGEN ACCUMULATOR PRESSURE RELIEF VALVE	SGP-001 sht 2 E06 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGBPSV0325 ADV SGBHV185 NITROGEN SUPPLY PRESSURE RELIEF VALVE	SGP-001 sht 2 E05 3	1 SV SA	AC ACTIVE O/C	LT SV	2YR 10Y	73ST-9SG05 73ST-9ZZ20		
SGEV346 INSTRUMENT AIR CHECK VALVE TO ADV 184	SGP-001 sht 2 B04 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI20 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGEV348 INSTRUMENT AIR CHECK VALVE TO ADV 179	SGP-001 sht 2 G04 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP CMP 2YR	73ST-9XI20 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGEV357 INSTRUMENT AIR CHECK VALVE TO ADV 178	SGP-001 sht 2 F04 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI20 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGEV358 INSTRUMENT AIR CHECK VALVE TO ADV 185	SGP-001 sht 2 D04 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9XI20 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGAUV0500P STEAM GENERATOR BLOWDOWN SAMPLE CIV (PEN. 46)	SGP-002 E03 2	6 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBUV0500Q STEAM GENERATOR BLOWDOWN SAMPLE CIV (PEN. 46)	SGP-002 E02 2	6 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI01		
SGBUV0500R STEAM GENERATOR BLOWDOWN SAMPLE CIV (PEN. 47)	SGP-002 A03 2	6 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGAUV0500S STEAM GENERATOR BLOWDOWN SAMPLE CIV (PEN. 47)	SGP-002 A02 2	6 GA AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI02		
SGEPSV0554 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 1 (PEN. 3)	SGP-001 sht 1 D12 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0555 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 1 (PEN. 3)	SGP-001 sht 1 D13 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0556 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 1 (PEN. 3)	SGP-001 sht 1 D14 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0557 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 1 (PEN. 3)	SGP-001 sht 1 D15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0558 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 2 (PEN. 4)	SGP-001 sht 1 A15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0559 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 2 (PEN. 4)	SGP-001 sht 1 A14 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0560 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 2 (PEN. 4)	SGP-001 sht 1 A13 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0561 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 2 (PEN. 4)	SGP-001 sht 1 A12 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0572 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 1 (PEN. 1)	SGP-001 sht 1 H12 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0573 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 1 (PEN. 1)	SGP-001 sht 1 H13 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGEPSV0574 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 1 (PEN. 1)	SGP-001 sht 1 H14 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0575 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 1 (PEN. 1)	SGP-001 sht 1 H14 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0576 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 2 (PEN. 2)	SGP-001 sht 1 F15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0577 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 2 (PEN. 2)	SGP-001 sht 1 F14 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0578 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 2 (PEN. 2)	SGP-001 sht 1 F13 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0579 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 2 (PEN. 2)	SGP-001 sht 1 F12 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEV642 DOWNCOMER FEEDWATER LINE CHECK VALVE (PEN. 11)	SGP-002 G11 2	8 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEV652 DOWNCOMER FEEDWATER LINE CHECK VALVE (PEN. 11)	SGP-002 G10 2	8 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEV653 DOWNCOMER FEEDWATER LINE CHECK VALVE (PEN. 12)	SGP-002 C10 2	8 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEPSV0691 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 2 (PEN. 2)	SGP-001 sht 1 F15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0692 MAIN STEAM SAFETY VALVE SG1 STEAM LINE 1 (PEN. 1)	SGP-001 sht 1 H15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEV693 DOWNCOMER FEEDWATER LINE CHECK VALVE (PEN. 12)	SGP-002 C11 2	8 CK SA	C ACTIVE C	BDO CVC	CMP CMP	Normal Ops 73ST-9XI32		Notes 1, 2, 3, 4
SGEPSV0694 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 2 (PEN. 4)	SGP-001 sht 1 A15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEPSV0695 MAIN STEAM SAFETY VALVE SG2 STEAM LINE 1 (PEN. 3)	SGP-001 sht 1 D15 2	6 SV SA	C ACTIVE O/C	SV	RFO	73ST-9ZZ18		Tested each refueling (ref. RCTS 038788)
SGEV887 WARM-UP LINE CHECK VALVE TO TURBINE-DRIVEN AFW PUMP	SGP-001 sht 1 D12 3	2 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI36 73ST-9AF02		Notes 1, 2, 3, 4
SGEV888 WARM-UP LINE CHECK VALVE TO TURBINE-DRIVEN AFW PUMP	SGP-001 sht 1 C13 3	2 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI36 73ST-9AF02		Notes 1, 2, 3, 4
SGEV982 ADV NITROGEN SUPPLY CHECK VALVE	SGP-001 sht 2 B06 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG05 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGEV985 ADV NITROGEN SUPPLY CHECK VALVE	SGP-001 sht 2 G06 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG05 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SGEV988 ADV NITROGEN SUPPLY CHECK VALVE	SGP-001 sht 2 D06 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG05 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGEV991 ADV NITROGEN SUPPLY CHECK VALVE	SGP-001 sht 2 F06 3	1 CK SA	AC ACTIVE C	BDO CVC LT	CMP CMP 2YR	73ST-9SG05 73ST-9SG05 73ST-9SG05		Notes 1, 2, 3, 4
SGAUV1133 STEAM TRAP SGN-M23 ISOLATION VALVE (PEN. 2)	SGP-001 sht 1 E15 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI32		
SGAUV1134 STEAM TRAP SGN-M24 ISOLATION VALVE (PEN. 3)	SGP-001 sht 1 C14 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI32		
SGBUV1135A STEAM TRAP SGN-M01 ISOLATION VALVE (PEN. 1)	SGP-001 sht 1 H11 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI32		
SGBUV1135B STEAM TRAP SGN-M02 ISOLATION VALVE (PEN. 2)	SGP-001 sht 1 F11 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI01 73ST-9XI01 73ST-9XI01 73ST-9XI32		
SGBUV1136A STEAM TRAP SGN-M03 ISOLATION VALVE (PEN. 3)	SGP-001 D11 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI32		
SGBUV1136B STEAM TRAP SGN-M04 ISOLATION VALVE (PEN. 4)	SGP-001 sht 1 A11 2	1 GL SO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI02 73ST-9XI02 73ST-9XI02 73ST-9XI32		
SGEPSE1183 ADV NITROGEN SUPPLY RUPTURE DISK	SGP-001 sht 2 F05 3	1 RD SA	AD ACTIVE O/C	LT REP	2YR 5YR	73ST-9SG05 Task# 89948		Replaced every 5 years per Mandatory Appendix I, I-1360
SGEPSE1184 ADV NITROGEN SUPPLY RUPTURE DISK	SGP-001 sht 2 D05 3	1 RD SA	AD ACTIVE O/C	LT REP	2YR 5YR	73ST-9SG05 Task# 89951		Replaced every 5 years per Mandatory Appendix I, I-1360
SGEPSE1185 ADV NITROGEN SUPPLY RUPTURE DISK	SGP-001 sht 2 B05 3	1 RD SA	AD ACTIVE O/C	LT REP	2YR 5YR	73ST-9SG05 Task# 108503		Replaced every 5 years per Mandatory Appendix I, I-1360
SGEPSE1186 ADV NITROGEN SUPPLY RUPTURE DISK	SGP-001 sht 2 G05 3	1 RD SA	AD ACTIVE O/C	LT REP	2YR 5YR	73ST-9SG05 Task# 108443		Replaced every 5 years per Mandatory Appendix I, I-1360
SIAVA10 PRESSURE LOCKING CHECK VALVE FOR SIAUV0655 BONNET	SIP-002 G03 2	1 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI21 73ST-9XI21		Notes 1, 2, 3, 4
SIBVA15 PRESSURE LOCKING CHECK VALVE FOR SIBUV0656 BONNET (PEN. 26)	SIP-002 G10 2	1 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI21 73ST-9XI21		Notes 1, 2, 3, 4

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIEV113 HPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 13)	SIP-002 F14 2	3 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI33		Notes 1, 2, 3, 4
SIEV114 LPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 17)	SIP-002 F13 2	12 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI27		Notes 1, 2, 3, 4
SIEV123 HPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 14)	SIP-002 F12 2	3 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI33		Notes 1, 2, 3, 4
SIEV124 LPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN.18)	SIP-002 F11 2	12 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI27		Notes 1, 2, 3, 4
SIEV133 HPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN.15)	SIP-002 F07 2	3 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI33		Notes 1, 2, 3, 4
SIEV134 LPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 19)	SIP-002 F06 2	12 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI26		Notes 1, 2, 3, 4
SIBPSV0140 SI PUMP SUCTION LINE FROM CONTAINMENT SUMP PRESSURE RELIEF VALVE (PEN. 24)	SIP-001 B15 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0141 PRESSURE RELIEF VALVE BETWEEN ISOLATION VALVES TO FUEL POOL COOLING	SIP-001 B15 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIEV143 HPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 16)	SIP-002 F04 2	3 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI33		Notes 1, 2, 3, 4
SIEV144 LPSI CHECK VALVE TO RCS COLD LEG INJECTION HEADER (PEN. 20)	SIP-002 F04 2	12 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9SI05 73ST-9XI26		Notes 1, 2, 3, 4
SIAPSV0150 PRESSURE RELIEF VALVE BETWEEN ISOLATION VALVES TO FUEL POOL COOLING	SIP-001 H15 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAPSV0151 SI PUMP SUCTION LINE FROM CONTMT SUMP PRESSURE RELIEF VALVE (PEN. 23)	SIP-001 G15 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAV157 CONTAINMENT SPRAY PUMP SUCTION LINE CHECK VALVE	SIP-001 G13 2	18 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI06 73ST-9SI06		Notes 1, 2, 3, 4
SIBV158 CONTAINMENT SPRAY PUMP SUCTION LINE CHECK VALVE	SIP-001 B13 2	18 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI06 73ST-9SI06		Notes 1, 2, 3, 4
SIAPSV0161 LPSI/SDC LINE PRESSURE RELIEF VALVE	SIP-001 H06 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIAPSV0162 PRESSURE RELIEF VALVE BETWEEN ISOLATION VALVES TO FUEL POOL COOLING	SIP-001 G05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAV164 CONTAINMENT SPRAY HEADER CHECK VALVE AND INBOARD CIV (PEN. 21)	SIP-002 F08 2	10 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 73ST-9CL01		Notes 1, 3, 4
SIBV165 CONTAINMENT SPRAY HEADER CHECK VALVE AND INBOARD CIV (PEN. 22)	SIP-002 F06 2	10 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 73ST-9CL01		Notes 1, 3, 4
SIBPSV0166 HPSI LONG TERM RECIRC PRESSURE RELIEF VALVE	SIP-002 G09 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIBPSV0169 SHUTDOWN COOLING LINE PRESSURE RELIEF VALVE	SIP-002 D10 1	0.75 SV SA	C ACTIVE O/C	SV	5YR	73ST-9ZZ20		Thermal Relief Valve
SIAPSV0179 SHUTDOWN COOLING RETURN LINE LTOP RELIEF VALVE (PEN. 27)	SIP-002 G03 2	6 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ19		
SIBPSV0189 SHUTDOWN COOLING RETURN LINE LTOP RELIEF VALVE (PEN. 26)	SIP-002 F11 2	6 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ19		
SIBPSV0191 SHUTDOWN COOLING HEAT EXCHANGER OUTLET PRESSURE RELIEF VALVE	SIP-001 D07 2	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIBPSV0192 PRESSURE RELIEF VALVE BETWEEN ISOLATION VALVES TO FUEL POOL COOLING	SIP-001 C05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0193 LPSI/SDC LINE PRESSURE RELIEF VALVE	SIP-001 D06 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAPSV0194 SHUTDOWN COOLING HEAT EXCHANGER OUTLET PRESSURE RELIEF VALVE	SIP-001 H07 2	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIBV200 LPSI PUMP SUCTION LINE CHECK VALVE	SIP-001 B12 2	20 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9XI11 73ST-9XI11		Note 1, 2, 3, 4
SIAV201 LPSI PUMP SUCTION LINE CHECK VALVE	SIP-001 F13 2	20 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9XI11 73ST-9XI11		Note 1, 2, 3, 4
SIAV205 CONTAINMENT RECIRCULATION SUMP CHECK VALVE TO SI SUPPLY HEADER	SIP-001 F14 2	24 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
SIBV206 CONTAINMENT RECIRCULATION SUMP CHECK VALVE TO SI SUPPLY HEADER	SIP-001 A14 2	24 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9ZZ25 73ST-9ZZ25		Notes 1, 3, 4 Disassembly and Inspection
SIEPSV0211 SAFETY INJECTION TANK 2A PRESSURE RELIEF VALVE	SIP-002 E15 2	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIEV215 SAFETY INJECTION TANK DISCHARGE CHECK VALVE	SIP-002 A15 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIEV217 COLD LEG SAFETY INJECTION LOOP CHECK VALVE	SIP-002 A13 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEPSV0221 SAFETY INJECTION TANK 2B PRESSURE RELIEF VALVE	SIP-002 E12 2	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIEV225 SAFETY INJECTION TANK DISCHARGE CHECK VALVE	SIP-002 A12 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEV227 COLD LEG SAFETY INJECTION LOOP CHECK VALVE	SIP-002 A10 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEPSV0231 SAFETY INJECTION TANK 1A PRESSURE RELIEF VALVE	SIP-002 E08 2	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIEV235 SAFETY INJECTION TANK DISCHARGE CHECK VALVE	SIP-002 A07 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEV237 COLD LEG SAFETY INJECTION LOOP CHECK VALVE	SIP-002 A06 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEPSV0241 SAFETY INJECTION TANK 1B PRESSURE RELIEF VALVE	SIP-002 E05 2	2 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIEV245 SAFETY INJECTION TANK DISCHARGE CHECK VALVE	SIP-002 A05 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIEV247 COLD LEG SAFETY INJECTION LOOP CHECK VALVE	SIP-002 A04 1	14 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI25 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1.
SIAPSV0285 SI PUMP COMBINED RECIRC PRESSURE RELIEF VALVE	SIP-001 F09 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0286 SI PUMP COMBINED RECIRC PRESSURE RELIEF VALVE	SIP-001 B09 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0287 CONTAINMENT SPRAY LINE PRESSURE RELIEF VALVE	SIP-001 C09 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIEPSV0288 SI MAXIFLOW RECIRC LINE RELIEF VALVE	SIP-001 E05 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAPSV0289 CONTAINMENT SPRAY LINE PRESSURE RELIEF VALVE	SIP-001 G09 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAHV0306 LPSI DISCHARGE HEADER ISOLATION VALVE	SIP-001 G05 2	10 GL MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-xXI11 73ST-xXI11	VRR-01 VRR-01	FSO includes position stop verification per TS SR 3.5.3.7 Note 5
SIBHV0307 LPSI HEADER DISCHARGE ISOLATION VALVE	SIP-001 B04 2	10 GL MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-xXI12 73ST-xXI12	VRR-01 VRR-01	FSO includes position stop verification per TS SR 3.5.3.7 Note 5

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SICHV0321 HPSI LONG TERM RECIRCULATION CIV (PEN. 77)	SIP-002 G02 2	3 GL MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-xXI11 73ST-xXI11	VRR-01 VRR-01	FSO includes position stop verification per TS SR 3.5.3.7 Note 5 QTR FS FOR PRA/RA.
SIBUV0322 HOT LEG INJECTION CHECK VALVE LEAK ISOLATION VALVE	SIP-002 E02 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13		
SIDHV0331 HPSI LONG TERM RECIRCULATION CIV (PEN. 67)	SIP-002 G09 2	3 GL MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-xXI12 73ST-xXI12	VRR-01 VRR-01	FSO includes position stop verification per TS SR 3.5.3.7 Note 5 QTR FS FOR PRA/RA.
SIBUV0332 HOT LEG INJECTION CHECK VALVE LEAK ISOLATION VALVE	SIP-002 E10 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14		
SIAV404 HPSI PMP DISCHARGE CHECK VALVE	SIP-001 F06 2	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI33 73ST-9XI33		Notes 1, 2, 3, 4 FSC also performed in 73ST-9XI35
SIBV405 HPSI PMP DISCHARGE CHECK VALVE	SIP-001 B04 2	4 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI33 73ST-9XI33		Notes 1, 2, 3, 4 FSC also performed in 73ST-9XI35
SIEPSV0407 SAFETY INJECTION TANK FILL LINE RELIEF VALVE	SIP-001 E08 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0409 HPSI LINE PRESSURE RELIEF VALVE	SIP-001 B02 2	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIAPSV0417 HPSI LINE PRESSURE RELIEF VALVE	SIP-001 F02 2	1.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAV424 HPSI PUMP RECIRC LINE CHECK VALVE	SIP-001 F10 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI11 73ST-9SI10		Notes 1, 2, 3
SIBV426 HPSI PUMP RECIRC LINE CHECK VALVE	SIP-001 A10 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI11 73ST-9SI10	 VRR-01	Notes 1, 2, 3
SIAV434 LPSI PUMP DISCHARGE CHECK VALVE	SIP-001 F09 2	10 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI14 73ST-9SI14		Notes 1, 2, 3, 4
SIAPSV0439 LPSI LINE PRESSURE RELIEF VALVE	SIP-001 H02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SIBV446 LPSI PUMP DISCHARGE CHECK VALVE	SIP-001 B09 2	10 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI14 73ST-9SI14		Notes 1, 2, 3, 4
SIBV448 LPSI PMP RECIRC LINE CHECK VALVE	SIP-001 B10 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI06 73ST-9SI11		Notes 1, 2, 3
SIBPSV0449 LPSI LINE PRESSURE RELIEF VALVE	SIP-001 D02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAV451 LPSI PMP RECIRC LINE CHECK VALVE	SIP-001 G11 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI06 73ST-9SI11		Notes 1, 2, 3

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIEV463 SAFETY INJECTION TANK FILL/DRAIN HEADER OUTBOARD CIV (PEN. 28)	SIP-001 D08 2	2 GL MA	A PASSIVE C	AJ	CLR	73ST-9CL01		
SIAPSV0468 HPSI LONG TERM RECIRC PRESSURE RELIEF VALVE	SIP-002 G02 2	0.75 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIAPSV0469 SHUTDOWN COOLING LINE PRESSURE RELIEF VALVE	SIP-002 D03 1	0.75 SV SA	C ACTIVE O/C	SV	5YR	73ST-9ZZ20		Thermal Relief Valve
SIEPSV0473 SAFETY INJECTION TANK FILL/DRAIN LINE PRESSURE RELIEF VALVE	SIP-001 E10 2	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		Thermal Relief Valve
SIEPSV0474 SAFETY INJECTION TANK FILL/DRAIN LINE PRESSURE RELIEF VALVE (PEN. 28)	SIP-001 D09 2	0.75 SV SA	AC ACTIVE O/C	AJ SV	CLR 10Y	73ST-9CL01 73ST-9ZZ20		Thermal Relief Valve
SIBV484 CONTAINMENT SPRAY PUMP DISCHARGE CHECK VALVE	SIP-001 C10 2	10 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI15 73ST-9SI15		Notes 1, 2, 3, 4
SIAV485 CONTAINMENT SPRAY PUMP DISCHARGE CHECK VALVE	SIP-001 H10 2	10 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SI15 73ST-9SI15		Notes 1, 2, 3, 4
SIAV486 CONTAINMENT SPRAY PMP RECIRC LINE CHECK VALVE	SIP-001 G10 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI10 73ST-9SI06		Notes 1, 2, 3
SIBV487 CONTAINMENT SPRAY PMP RECIRC LINE CHECK VALVE	SIP-001 C10 2	2 CK SA	C ACTIVE O	BDC CVO	QTR QTR	73ST-9SI10 73ST-9SI06		Notes 1, 2, 3
SIAV522 HPSI LONG-TERM RECIRC CHECK VALVE	SIP-002 C02 1	3 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIAV523 HPSI LONG-TERM RECIRC INBOARD CIV (PEN. 77)	SIP-002 F02 1	3 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIBV532 HPSI LONG-TERM RECIRC CHECK VALVE	SIP-002 B10 1	3 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIBV533 HPSI LONG-TERM RECIRC INBOARD CIV (PEN. 67)	SIP-002 F09 1	3 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9XI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIEV540 COLD LEG SAFETY INJECTION CHECK VALVE	SIP-002 B13 1	12 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9SI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIEV541 COLD LEG SAFETY INJECTION CHECK VALVE	SIP-002 B11 1	12 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9SI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIEV542 COLD LEG SAFETY INJECTION CHECK VALVE	SIP-002 C06 1	12 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9SI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1
SIEV543 COLD LEG SAFETY INJECTION CHECK VALVE	SIP-002 C04 1	12 CK SA	AC ACTIVE O/C	CVC CVO LT	CMP CMP 18M	73ST-9SI03 73ST-9SI33 73ST-9SI03		Notes 1, 2, 3, 4 Leak test frequency is 18 months per TS SR 3.4.15.1

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIAHV0604 HPSI LONG TERM RECIRC ISOLATION VALVE	SIP-001 G03 2	3 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA.
SIAHV0605 SAFETY INJECTION TANK 2A ATMOSPHERIC VENT VALVE	SIP-002 F15 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIAHV0606 SAFETY INJECTION TANK 2B ATMOSPHERIC VENT VALVE	SIP-002 F12 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIAHV0607 SAFETY INJECTION TANK 1A ATMOSPHERIC VENT VALVE	SIP-002 F07 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIAHV0608 SAFETY INJECTION TANK 1B ATMOSPHERIC VENT VALVE	SIP-002 F04 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIBHV0609 HPSI LONG TERM RECIRC ISOLATION VALVE	SIP-001 C03 2	3 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA.
SIBUV0611 SAFETY INJECTION TANK 2A FILL/DRAIN ISOLATION VALVE	SIP-002 B16 2	2 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04		
SIBHV0613 SAFETY INJECTION TANK 2A ATMOSPHERIC VENT VALVE	SIP-002 E15 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIBUV0614 SAFETY INJECTION TANK 2A DISCHARGE ISOLATION VALVE	SIP-002 A15 1	14 GA MO	B ACTIVE O	FSO STO	1CY 18M	73ST-9XI25 73ST-9XI25	VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
SIBUV0615 LPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 17)	SIP-002 G14 2	12 GL MO	B ACTIVE O	FSO STO	1CY 18M	73ST-xXI12 73ST-xXI12	VRR-01 VRR-01	FSO includes position stop verification per SR 3.5.3.7 18M ST for TS 3.3.5.4 Note 5
SIBUV0616 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 13)	SIP-002 G14 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4

Valve ID Description	Drawing Coord/Sht# Code Class	Size (in) Type Act.	Cat. A/P S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIAUV0617 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 13)	SIP-002 G15 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIBUV0618 SAFETY INJECTION TANK 2A CHECK VALVE LEAKAGE TEST LINE ISOLATION VALVE	SIP-002 B16 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04		
SIAHV0619 SIT NITROGEN SUPPLY ISOLATION VALVE	SIP-002 D15 2	1 GL AO	B PASSIVE C	VP	2YR	73ST-9XI25		
SIBUV0621 SAFETY INJECTION TANK 2B FILL/DRAIN ISOLATION VALVE	SIP-002 B12 2	2 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04		
SIBHV0623 SAFETY INJECTION TANK 2B ATMOSPHERIC VENT VALVE	SIP-002 E12 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIBUV0624 SAFETY INJECTION TANK 2B DISCHARGE ISOLATION VALVE	SIP-002 A12 1	14 GA MO	B ACTIVE O	FSO STO	1CY 18M	73ST-9XI25 73ST-9XI25	VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
SIBUV0625 LPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 18)	SIP-002 G11 2	12 GL MO	B ACTIVE O	FSO STO	1CY 18M	73ST-xXI12 73ST-xXI12	VRR-01 VRR-01	FSO includes position stop verification per SR 3.5.3.7 18M ST for TS 3.3.5.4 Note 5
SIBUV0626 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 14)	SIP-002 G11 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIAUV0627 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 14)	SIP-002 G12 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIBUV0628 SAFETY INJECTION TANK 2B CHECK VALVE LEAKAGE TEST LINE ISOLATION VALVE	SIP-002 B13 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04		
SIAHV0629 SIT NITROGEN SUPPLY ISOLATION VALVE	SIP-002 D12 2	1 GL AO	B PASSIVE C	VP	2YR	73ST-9XI25		
SIBUV0631 SAFETY INJECTION TANK 1A FILL/DRAIN ISOLATION VALVE	SIP-002 C08 2	2 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03		
SIBHV0633 SAFETY INJECTION TANK 1A ATMOSPHERIC VENT VALVE	SIP-002 E07 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIAUV0634 SAFETY INJECTION TANK 1A DISCHARGE ISOLATION VALVE	SIP-002 B07 1	14 GA MO	B ACTIVE O	FSO STO	1CY 18M	73ST-9XI25 73ST-9XI25	VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
SIAUV0635 LPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 19)	SIP-002 G06 2	12 GL MO	B ACTIVE O	FSO STO	1CY 18M	73ST-xXI11 73ST-xXI11	VRR-01 VRR-01	FSO includes position stop verification per SR 3.5.3.7 18M ST for TS 3.3.5.4 Note 5
SIBUV0636 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 15)	SIP-002 G07 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIAUV0637 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 15)	SIP-002 G08 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIBUV0638 SAFETY INJECTION TANK 1A CHECK VALVE LEAKAGE TEST LINE ISOLATION VALVE	SIP-002 B08 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03		
SIAHV0639 SIT NITROGEN SUPPLY ISOLATION VALVE	SIP-002 D07 2	1 GL AO	B PASSIVE C	VP	2YR	73ST-9XI25		
SIBUV0641 SAFETY INJECTION TANK 1B FILL/DRAIN ISOLATION VALVE	SIP-002 B06 2	2 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03		
SIBHV0643 SAFETY INJECTION TANK 1B ATMOSPHERIC VENT VALVE	SIP-002 E04 2	1 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	CSD CSD CSD CSD CSD 2YR	73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37 73ST-9XI37	CSJ-10 CSJ-10 CSJ-10 CSJ-10 CSJ-10	
SIAUV0644 SAFETY INJECTION TANK 1B DISCHARGE ISOLATION VALVE	SIP-002 B04 1	14 GA MO	B ACTIVE O	FSO STO	1CY 18M	73ST-9XI25 73ST-9XI25	VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIAUV0645 LPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 20)	SIP-002 G04 2	12 GL MO	B ACTIVE O	FSO STO	1CY 18M	73ST-xXI11 73ST-xXI11	VRR-01 VRR-01	FSO includes position stop verification per SR 3.5.3.7 18M ST for TS 3.3.5.4 Note 5
SIBUV0646 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 16)	SIP-002 G04 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIAUV0647 HPSI DISCHARGE HEADER OUTBOARD CIV (PEN. 16)	SIP-002 G05 2	2 GL MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIBUV0648 SAFETY INJECTION TANK 1B CHECK VALVE LEAKAGE TEST LINE ISOLATION VALVE	SIP-002 B06 1	1 GL AO	B ACTIVE C	FSC FTC STC VP	QTR QTR QTR 2YR	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03		
SIAHV0649 SIT NITROGEN SUPPLY ISOLATION VALVE	SIP-002 D05 2	1 GL AO	B PASSIVE C	VP	2YR	73ST-9XI25		
SIAUV0651 SHUTDOWN COOLING SUCTION ISOLATION VALVE	SIP-002 C03 1	16 GA MO	A ACTIVE O/C	FSC FSO LT	1CY 1CY 18M	73ST-9XI21 73ST-9XI21 73ST-9SI03	VRR-01 VRR-01	Leak test frequency is 18 months per TS SR 3.4.15.1 Note 5

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIBUV0652 SHUTDOWN COOLING SUCTION ISOLATION VALVE	SIP-002 C10 1	16 GA MO	A ACTIVE O/C	FSC FSO LT	1CY 1CY 18M	73ST-9XI21 73ST-9XI21 73ST-9SI03	VRR-01 VRR-01	Leak test frequency is 18 months per TS SR 3.4.15.1 Note 5
SICUV0653 SHUTDOWN COOLING SUCTION INBOARD CIV (PEN. 27)	SIP-002 D03 1	16 GA MO	A ACTIVE O/C	FSC FSO LT	CSD CSD 18M	73ST-9XI21 73ST-9XI21 73ST-9SI03	CSJ-05 CSJ-05	Leak test frequency is 18 months per TS SR 3.4.15.1 Note 5 PRA/RA REQ'D QTR EXERCISING IS N/A PER CSJ-11.
SIDUV0654 SHUTDOWN COOLING SUCTION INBOARD CIV (PEN. 26)	SIP-002 D10 1	16 GA MO	A ACTIVE O/C	FSC FSO LT	CSD CSD 18M	73ST-9XI21 73ST-9XI21 73ST-9SI03	CSJ-05 CSJ-05	Leak test frequency is 18 months per TS SR 3.4.15.1 Note 5 PRA/RA REQ'D QTR EXERCISING IS N/A PER CSJ-11.
SIAUV0655 SHUTDOWN COOLING SUCTION OUTBOARD CIV (PEN. 27)	SIP-002 G03 2	16 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI21 73ST-9XI21	VRR-01 VRR-01	Note 5
SIBUV0656 SHUTDOWN COOLING SUCTION OUTBOARD CIV (PEN. 26)	SIP-002 G10 2	16 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI21 73ST-9XI21	VRR-01 VRR-01	Note 5
SIAHV0657 SHUTDOWN COOLING HEAT EXCHANGER OUTLET THROTTLE VALVE	SIP-001 H03 2	16 BF MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5
SIBHV0658 SHUTDOWN COOLING HEAT EXCHANGER OUTLET THROTTLE VALVE	SIP-001 C03 2	16 BF MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5
SIBUV0659 SI COMBINED RECIRC TO RWT ISOLATION VALVE	SIP-001 B06 2	4 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14		
SIAUV0660 SI COMBINED RECIRC TO RWT ISOLATION VALVE	SIP-001 F06 2	4 GL SO	B ACTIVE O/C	FSC FSO FTC STC STO VP	QTR QTR QTR QTR QTR 2YR	73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13		
SIAUV0664 CONTAINMENT SPRAY PUMP RECIRC TO RWT ISOLATION VALVE	SIP-001 G10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4 73ST-9SI06 may be required for retest after open limit switch adjustment
SIBUV0665 CONTAINMENT SPRAY PUMP RECIRC TO RWT ISOLATION VALVE	SIP-001 B10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4 73ST-9SI06 may be required for retest after open limit switch adjustment
SIAUV0666 HPSI PUMP RECIRC TO RWT ISOLATION VALVE	SIP-001 F10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIBUV0667 HPSI PUMP RECIRC TO RWT	SIP-001 A10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIBUV0668 LPSI PUMP RECIRC TO RWT ISOLATION VALVE	SIP-001 B10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI14 73ST-9XI14 73ST-9XI14 73ST-9XI14	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIAUV0669 LPSI PUMP RECIRC TO RWT ISOLATION VALVE	SIP-001 G10 2	2 GL MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI13 73ST-9XI13 73ST-9XI13 73ST-9XI13	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIBUV0671 CONTAINMENT SPRAY CONTROL VALVE AND OUTBOARD CIV (PEN. 22)	SIP-001 C06 2	8 GA MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI04 73ST-9XI04 73ST-9XI04 73ST-9XI04	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIAUV0672 CONTAINMENT SPRAY CONTROL VALVE AND OUTBOARD CIV (PEN. 21)	SIP-001 G06 2	8 GA MO	B ACTIVE O/C	FSC FSO STC STO	1CY 1CY 18M 18M	73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03	VRR-01 VRR-01 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
SIAUV0673 CONTAINMENT SUMP TO SI PUMP SUCTION INBOARD CIV (PEN. 23)	SIP-001 G16 2	24 BF MO	A ACTIVE O/C	FSC FSO LT STO	18M 18M 2YR 18M	73ST-9XI03 73ST-9XI03 73ST-9XI43 73ST-9XI03	VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
SIAUV0674 CONTAINMENT SUMP TO SI PUMP SUCTION OUTBOARD CIV (PEN. 23)	SIP-001 G14 2	24 BF MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIBUV0675 CONTAINMENT SUMP TO SI PUMP SUCTION INBOARD CIV (PEN. 24)	SIP-001 A16 2	24 BF MO	A ACTIVE O/C	FSC FSO LT STO	18M 18M 2YR 18M	73ST-9XI04 73ST-9XI04 73ST-9XI43 73ST-9XI04	VRR-01 VRR-01 VRR-01	Note 5 18M ST FOR TS 3.3.5.4
SIBUV0676 CONTAINMENT SUMP TO SI PUMP SUCTION OUTBOARD CIV (PEN. 24)	SIP-001 A14 2	24 BF MO	B ACTIVE O	FSO STO	QTR 18M	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA 18M ST FOR TS 3.3.5.4
SIAHV0678 S/D COOLING HEAT EXCHANGER ISOLATION TRAIN A	SIP-001 H09 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5
SIBHV0679 S/D COOLING HEAT EXCHANGER ISOLATION TRAIN B	SIP-001 C09 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5
SIAUV0682 SAFETY INJECTION TANK FILL LINE CIV (PEN. 28)	SIP-001 D10 2	2 GL AO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI03 73ST-9XI03 73ST-9XI03 73ST-9XI03		
SIAHV0683 LPSI PUMP SUCTION ISOLATION TRAIN A	SIP-001 F13 2	20 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIAHV0684 CTMT SPRAY TO S/D COOLING HEAT EXCHANGER ISOLATION TRAIN A	SIP-001 H09 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5
SIAHV0685 LPSI PUMP TO SHUTDOWN COOLING HEAT EXCHANGER ISOLATION VALVE	SIP-001 G08 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5
SIAHV0686 SHUTDOWN COOLING HEAT EXCHANGER OUTLET TO LPSI ISOLATION VALVE	SIP-001 H06 2	20 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI13 73ST-9XI13	VRR-01 VRR-01	Note 5
SIAHV0687 CTMT SPRAY ISOLATION TRAIN A	SIP-001 G06 2	10 GA MO	B ACTIVE O	FSC FSO	1CY 1CY	73ST-9XI13 73ST-9XI13		Note 5
SIAHV0688 CONTAINMENT SPRAY BYPASS VALVE	SIP-001 G09 2	10 GA MO	B ACTIVE C	FSC FSO	1CY 1CY	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5
SIBHV0689 CTMT SPRAY TO S/D COOLING HEAT EXCHANGER ISOLATION TRAIN B	SIP-001 C09 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5
SIBHV0690 SHUTDOWN COOLING WARMUP BYPASS CONTAINMENT ISOLATION VALVE (PEN. 26)	SIP-002 H13 2	10 GL MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5
SIAHV0691 SHUTDOWN COOLING WARMUP BYPASS CONTAINMENT ISOLATION VALVE (PEN. 27)	SIP-002 H03 2	10 GL MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI03 73ST-9XI03	VRR-01 VRR-01	Note 5
SIBHV0692 LPSI PUMP SUCTION ISOLATION TRAIN B	SIP-001 B13 2	20 GA MO	B ACTIVE O/C	FSC FSO	QTR QTR	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5 QTR FS FOR PRA/RA
SIBHV0693 CONTAINMENT SPRAY BYPASS VALVE	SIP-001 C09 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI04 73ST-9XI04	VRR-01 VRR-01	Note 5
SIBHV0694 LPSI CROSS CONNECT VALVE TO SHUTDOWN COOLING HEAT EXCHANGER	SIP-001 C08 2	10 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5
SIBHV0695 CTMT SPRAY ISOLATION TRAIN B	SIP-001 C06 2	10 GA MO	B ACTIVE O	FSC FSO	1CY 1CY	73ST-9XI14 73ST-9XI14		Note 5
SIBHV0696 SHUTDOWN COOLING HEAT EXCHANGER OUTLET TO LPSI ISOLATION VALVE	SIP-001 C06 2	20 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI14 73ST-9XI14	VRR-01 VRR-01	Note 5
SIAHV0698 HPSI HEADER DISCHARGE ISOLATION VALVE	SIP-001 F04 2	4 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI33 73ST-9XI33	VRR-01 VRR-01	Note 5 PREVIOUSLY TESTED IN 73ST-9XI13.
SIBHV0699 HPSI HEADER DISCHARGE ISOLATION VALVE	SIP-001 B03 2	4 GA MO	B ACTIVE O/C	FSC FSO	1CY 1CY	73ST-9XI33 73ST-9XI33	VRR-01 VRR-01	Note 5 PREVIOUSLY TESTED IN 73ST-9XI14.
SIAUV0708 CONTAINMENT SUMP TRAIN A SAMPLE TO PASS ISOLATION VALVE (PEN. 23)	SIP-001 G15 2	0.5 GL SO	B PASSIVE C	STC VP	RFO 2YR	73ST-9XI21 73ST-9XI21		STC is an augmented test, performed at RFO to satisfy ESF response time testing per SR 3.3.5.4 and CIV isolation time testing per SR 3.6.3.5.
SIAUV0709 MINI-FLOW RECIRC LINE SAMPLE ISOLATION VALVE	SIP-001 E08 2	0.5 GL SO	B PASSIVE C	STC VP	RFO 2YR	73ST-9XI21 73ST-9XI21		STC is an augmented test, performed at RFO to satisfy ESF response time testing per SR 3.3.5.4.

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SIBUV0710 MINI-FLOW RECIRC LINE SAMPLE ISOLATION VALVE	SIP-001 B07 2	0.5 GL SO	B PASSIVE C	STC VP	RFO 2YR	73ST-9XI21 73ST-9XI21		STC is an augmented test, performed at RFO to satisfy ESF response time testing per SR 3.3.5.4.
SIAPSV0754 PRESSURE LOCKING RELIEF VALVE FOR SIAUV0651 BONNET	SIP-002 B03 1	0.5 SV SA	C ACTIVE O/C	SV	5YR	73ST-9ZZ20		Thermal Relief Valve
SIBPSV0755 PRESSURE LOCKING RELIEF VALVE FOR SIBUV0652 BONNET	SIP-002 B03 1	0.5 SV SA	C ACTIVE O/C	SV	5YR	73ST-9ZZ20		Thermal Relief Valve
SIAV997 PRESSURE LOCKING CHECK VALVE FOR SICUV0653 BONNET	SIP-002 E03 1	1 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI21 73ST-9XI21		Notes 1, 2, 3, 4
SIBV998 PRESSURE LOCKING CHECK VALVE FOR SIDUV0654 BONNET	SIP-002 D10 1	1 CK SA	C ACTIVE O/C	CVC CVO	CMP CMP	73ST-9XI21 73ST-9XI21		Notes 1, 2, 3, 4
SPBV012 ESSENTIAL SPRAY POND PUMP DISCHARGE CHECK VALVE	SPP-001 C06 3	24 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SP02 73ST-9SP01		Notes 1, 2, 3, 4
SPAPSV0029 ESSENTIAL COOLING WATER HEAT EXCHANGER PRESSURE RELIEF VALVE	SPP-002 D03 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPBPSV0030 ESSENTIAL COOLING WATER HEAT EXCHANGER PRESSURE RELIEF VALVE	SPP-002 D06 3	1 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPAV041 ESSENTIAL SPRAY POND PUMP DISCHARGE CHECK VALVE	SPP-001 C04 3	24 CK SA	C ACTIVE O	BDC CVO	CMP CMP	73ST-9SP02 73ST-9SP01		Notes 1, 2, 3, 4
SPAPSV0137 EDG FUEL OIL COOLER PRESSURE RELIEF VALVE	SPP-002 G02 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPBPSV0138 EDG LUBE OIL COOLER PRESSURE RELIEF VALVE	SPP-002 G06 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPAPSV0139 EDG JACKET WATER COOLER PRESSURE RELIEF VALVE	SPP-002 F02 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPBPSV0140 EDG AIR INTERCOOLER PRESSURE RELIEF VALVE	SPP-002 F06 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPAPSV0141 EDG AIR INTERCOOLER PRESSURE RELIEF VALVE	SPP-002 F02 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPBPSV0142 EDG JACKET WATER COOLER PRESSURE RELIEF VALVE	SPP-002 F06 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPAPSV0143 EDG LUBE OIL COOLER PRESSURE RELIEF VALVE	SPP-002 E02 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPBPSV0144 EDG FUEL OIL COOLER PRESSURE RELIEF VALVE	SPP-002 F06 3	2.5 SV SA	C ACTIVE O/C	SV	10Y	73ST-9ZZ20		
SPEHCV0207 SPRAY POND CROSSCONNECT VALVE	SPP-001 E05 3	10 BF MA	B ACTIVE O/C	FSC FSO	6M 6M	73ST-9XI31 73ST-9XI31		

Valve ID / Description	Drawing Coord/Sht# / Code Class	Size (in) / Type / Act.	Cat. / A/P / S.P.	Test	Freq	Procedure	CSJ/ ROJ/ VRR	Remarks
SPEHCV0208 SPRAY POND CROSSCONNECT VALVE	SPP-001 E04 3	10 BF MA	B ACTIVE O/C	FSC FSO	6M 6M	73ST-9XI31 73ST-9XI31		
SSBUV0200 HOT LEG SAMPLE LINE OUTBOARD CIV (PEN. 42C)	SSP-001 G05 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
SSBUV0201 PRESSURIZER SURGE LINE SAMPLE LINE OUTBOARD CIV (PEN. 42A)	SSP-001 F05 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
SSBUV0202 PRESSURIZER STEAM SPACE SAMPLE LINE OUTBOARD CIV (PEN. 42B)	SSP-001 F05 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
SSAUV0203 HOT LEG SAMPLE LINE INBOARD CIV (PEN. 42C)	SSP-001 G07 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
SSAUV0204 PRESSURIZER SURGE LINE SAMPLE LINE INBOARD CIV (PEN. 42A)	SSP-001 F07 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
SSAUV0205 PRESSURIZER STEAM SPACE SAMPLE LINE INBOARD CIV (PEN. 42B)	SSP-001 E07 2	0.375 GL SO	A ACTIVE C	AJ FSC FTC STC VP	CLR QTR QTR QTR 2YR	73ST-9CL01 73ST-9XI06 73ST-9XI06 73ST-9XI06 73ST-9XI06		
WCEV039 NORMAL CHILLED WATER SUPPLY TO CONTAINMENT INBOARD CIV (PEN. 60)	WCP-001 E05 2	10 CK SA	AC ACTIVE O/C	AJ CVC CVO	CLR CMP CMP	73ST-9CL01 73ST-9CL01 40DP-9OP05		Notes 1, 2, 3, 4
WCBUV0061 NORMAL CHILLED WATER RETURN FROM CONTAINMENT INBOARD CIV (PEN. 61)	WCP-001 G05 2	10 GA MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI07 73ST-9XI07	 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
WCAUV0062 NORMAL CHILLED WATER RETURN FROM CONTAINMENT OUTBOARD CIV (PEN. 61)	WCP-001 G05 2	10 GA MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI07 73ST-9XI07	 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4
WCBUV0063 NORMAL CHILLED WATER SUPPLY TO CONTAINMENT OUTBOARD CIV (PEN. 60)	WCP-001 G06 2	10 GA MO	A ACTIVE C	AJ FSC STC	CLR 1CY 18M	73ST-9CL01 73ST-9XI07 73ST-9XI07	 VRR-01 VRR-01	Note 5 18M ST REQ'D FOR TS 3.3.5.4

PRRs, CSJs, ROJs, and VRRs

The following table lists the Pump 10CFR50.55a Requests (PRRs), Cold Shutdown Justifications (CSJs), Refueling Outage Justifications (ROJs), and Valve 10CFR50.55a Requests (VRRs) used in the PVNGS Pump and Valve Inservice Testing Program.

Identifier	Subject (and Notes)
PRR-01	Essential Auxiliary Feedwater Pump Flow Rate Measurement
PRR-02	Diesel Fuel Oil Transfer Pump Suction Pressure Measurement
PRR-03	LPSI Pump Flow Rate Measurement
PRR-04	HPSI Pump Flow Rate Measurement
PRR-05	Containment Spray Pump Flow Rate Measurement
PRR-06	Charging Pump Vibration Measurement
PRR-07	Smooth-Running Pumps
CSJ-01	AFW Discharge Header Check Valve Open Exercising
CSJ-02	AFW Header Check Valve Open Exercising
CSJ-03	Auxiliary Pressurizer Spray Valve Exercising
CSJ-04	Letdown Isolation Valve Closed Exercising
CSJ-05	Shutdown Cooling Suction Isolation Valve Exercising
CSJ-06	Instrument Air Containment Isolation Valve Closed Exercising
CSJ-07	Reactor Head Vent and Pressurizer Vent Valve Exercising
CSJ-08	Feedwater Isolation Valve Closed Exercising
CSJ-09	Main Steam Isolation Valve Closed Exercising
CSJ-10	SIT Vent Valve Exercising
ROJ-01	Containment Refueling Purge Valve Closed Exercising
ROJ-02	RCP Seal Bleed-Off Isolation Valve Closed Exercising
VRR-01	Code Case OMN-1 - MOV Exercising and Stroke Timing

PUMP 10CFR50.55a REQUEST PRR-01
Relief Request In Accordance with 10CFR50.55a(f)(5)(iii)

-- Inservice Testing Impracticality –

Essential Auxiliary Feedwater Pump Flow Rate Measurement During Group B Test

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
AFA-P01	Essential Auxiliary Feedwater Pump (Turbine-Driven)	3	B
AFB-P01	Essential Auxiliary Feedwater Pump (Motor-Driven)	3	B

Component/System Function:

The essential auxiliary feedwater (AF) pumps supply water to the steam generators during an accident. They also can be used to supply feedwater to the steam generators during plant startup and shutdown.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5122, "Group B Test Procedure," "Group B tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5122(b), "The differential pressure or flow rate shall be determined and compared to its reference value.

Impracticality of Compliance:

The Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) are impractical since this is a fixed resistance recirculation path with no flow instrumentation provided. When the pump operates on minimum flow recirculation (approx. 260 gpm) the specified reference point is essentially achieved by the recirculation lines fixed resistance. To establish the fixed resistance the minimum flow recirculation line contains an administratively controlled locked-throttled drag valve and a locked open manual isolation valve. The use of an ultrasonic flowmeter was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the AF mini-flow piping. Allowing the flow to remain fixed by the locked-in resistance increases the potential for repeatable test results and degradation monitoring rather than changing the resistance based on ultrasonic flow meter readout flucuations. With this understanding, there is little value added in installing flow instrumentation to measure and record the flow with instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

To comply with the Code there are only two practical flow paths available for testing AFA-P01 and AFB-P01. The primary flow path is into the main feedwater lines to the steam generators. The other flow path is the minimum flow recirculation line that recirculates back to the condensate storage tank. The flow path to the steam generators is equipped with flow instrumentation, but the recirculation line is a fixed-resistance circuit with no provisions for flow indication.

Use of the primary flow path at power would inject cold auxiliary feedwater into the main feedwater lines. The resulting temperature perturbations could lead to thermal shock / fatigue damage to the feedwater piping and steam generators, and the cooldown of the reactor coolant system could cause undesirable reactivity variations and power fluctuations.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed at approximately 260 gpm and differential pressure is used to monitor degradation. Use of an ultrasonic flow meter and possible adjustment of the fixed resistance introduces the potential for less accurate degradation monitoring than currently employed.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group B pump testing for pumps AFA-P01 and AFB-P01 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance to establish the specified reference point. ISTB-5100(b)(2) allows the use of bypass test loops to be used for Group B tests. The PVNGS minimum flow recirculation line is designed to meet the pump manufacturers operating specifications with a flow rate of approximately 260 gpm. Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5100-1.

Pumps AFA-P01 and AFB-P01 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps AFA-P01 and AFB-P01 are standby pumps. Little degradation is expected during plant plant operation when the pumps are idle except for testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with no flow instrumentation provided.

Duration of Proposed Alternative:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Complies with NRC Generic Letter 89-04, Position 9. Relief Request PRR-01 was previously authorized for Palo Verde pursuant to 10 CFR 50.55a(f)(6)(i) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128).

PUMP 10CFR50.55a REQUEST PRR-02
Relief Request In Accordance with 10CFR50.55a(a)(3)(i)

-- On the basis that the proposed alternative provides an acceptable level of quality and safety --

Diesel Fuel Oil Transfer Pump Suction Pressure Measurement

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
DFA-P01	Diesel Generator Fuel Oil Transfer Pump	3	B
DFB-P01	Diesel Generator Fuel Oil Transfer Pump	3	B

Component/System Function:

Transfer diesel fuel from the fuel oil storage tank to the EDG day tank.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3510, "General," ISTB-3510(a), "Accuracy", Instrument accuracy shall be within the limits of Table ISTB-3500-1.

Table ISTB-3500-1, "Required Instrument Accuracy", Pressure, Comprehensive Test, ± 0.5% accuracy.

Reason for Request:

There are no inlet pressure gauges installed for this pump configuration. Specifically, the pumps are horizontal, centrifugal type with an integral motor. They operate submerged in the diesel fuel oil storage tank. The pump and drive motor are completely housed in an enclosed steel casing with no shaft penetrations requiring seals or packing. The casing has a hermetically sealed compartment for the stator windings of the motor to prevent entrance of pumped liquid or vapor. Pump bearings are cooled by recirculation of pumped fluid. The entire assembly is suspended from a cover plate, which is bolted to a nozzle on the tank.

The diesel generator fuel oil storage tank is equipped with level instrumentation (DFN-LI-33 and DFN-LI-34) having a calculated loop accuracy of ± 1.5%. The instrument reads out in percent of tank level which is converted to suction pressure during the quarterly pump surveillance test. The calibrated instrument range results in a suction pressure span of 0.2 psig to 4.4 psig. This instrument accuracy is acceptable for use during Group B pump testing but does not meet the ± 0.5% accuracy as required by Table ISTB-3500-1 for Comprehensive Pump Testing performed every 2 years.

Proposed Alternatives and Basis for Use:

The installed instrumentation converts to a full-scale range of 4.4 psig, which only slightly exceeds the pump suction reference value of 3.8 psig (full scale equals 1.15 times reference).

Considering the existing 1.5% accuracy of the level instrument, the reading could be as high as 3.85 psig or as low as 3.74 psig. This results in less than a 0.06 psig difference in the readings and is considered insignificant when monitoring for degradation. The existing accuracy is equivalent to the 1.5% minimum accuracy allowed by the combination of instrument full-scale range and accuracy as specified in Subsection ISTB 3510 for comprehensive pump testing. This accuracy provides adequate assurance of operability. The current instrumentation provides sufficient repeatability to allow for an evaluation of the pump hydraulic condition and detect pump degradation.

Use of the existing diesel generator fuel oil storage tank instrumentation should be considered an acceptable alternative to the accuracy requirements of Table ISTB-3500-1.

Supporting Facts:

Technical Specification 3.8.3.1 requires that the diesel generator fuel oil storage tank be maintained at ≥ 80% which is verified every 31 days to assure sufficient supply for 7 days of full load operation. The difference between minimum allowable tank level and top of the tank is only 26.4 inches. Due to strict controls placed on fuel oil level, the suction pressure cannot vary by more than 0.7 psig. Review of test history shows that the maximum variance recorded is approximately 0.5 psig. The suction pressure is essentially fixed by the TS level requirements, allowing for very little variation in suction pressure. There is no value added in providing more precise suction pressure instrumentation for monitoring pump degradation.

The following test history shows the essentially constant suction pressure:

Unit	Pump ID	Date	Suction Pressure
1	1MDFAP01	6/6/2006	3.8
	1MDFAP01	8/24/2006	4
	1MDFAP01	11/15/2006	4
	1MDFAP01	2/8/2007	4
	1MDFAP01	5/3/2007	3.9
	1MDFBP01	5/18/2006	4.3
	1MDFBP01	8/10/2006	3.9
	1MDFBP01	11/2/2006	3.6
	1MDFBP01	1/25/2007	3.8

	1MDFBP01	4/19/2007	3.85
2	2MDFAP01	4/20/2006	3.7
	2MDFAP01	5/4/2006	3.6
	2MDFAP01	7/25/2006	4
	2MDFAP01	1/10/2007	4
	2MDFAP01	4/5/2007	3.9
	2MDFBP01	2/9/2006	3.9
	2MDFBP01	7/13/2006	3.8
	2MDFBP01	10/15/2006	3.8
	2MDFBP01	12/27/2006	3.7
	2MDFBP01	3/21/2007	3.7
3	3MDFAP01	4/30/2006	4.1
	3MDFAP01	6/28/2006	3.7
	3MDFAP01	9/19/2006	4.1
	3MDFAP01	12/15/2006	3.7
	3MDFAP01	3/6/2007	3.9
	3MDFBP01	4/18/2006	3.4
	3MDFBP01	6/13/2006	3.9
	3MDFBP01	9/5/2006	4
	3MDFBP01	11/28/2006	3.9
	3MDFBP01	2/22/2007	3.8

Using the installed instrument (DFN-LI-33 and DFN-LI-34) for Group B and Comprehensive Pump Testing (CPT) provides an acceptable level of quality and safety since the instrument used yields a reading that is as at least equivalent to that achieved using an instrument that meets the Code requirements as described in Table ISTB-3500-1

The installed level instruments, DFN-LI-33 and DFN-LI-34, will be used to determine diesel fuel oil transfer pump suction pressure during inservice testing.

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The existing 1.5% accuracy of the level instrument discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

None

References:

NUREG 1482, Revision 1, 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."

PUMP 10CFR50.55a REQUEST PRR-03
Relief Request In Accordance with 10CFR50.55a(f)(5)(iii)

-- Inservice Testing Impracticality –

LPSI Pump Flow Rate Measurement

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
SIA-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIB-P01	Low Pressure Safety Injection (LPSI) Pump	2	A

Component/System Function:

LPSI pumps SIA-P01 and SIB-P01 provide low-pressure coolant injection of borated water into the reactor coolant system under accident conditions. They also provide shutdown cooling flow post-accident and during normal reactor startup and shutdown.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5221, "Group A Test Procedure," "Group A tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5221(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

ISTB-5221(c), "Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values."

Impracticality of Compliance:

The Code requires the Group A reference point flow rate to be established at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value). It is impractical to meet this requirement since this is a fixed resistance recirculation path of approximately 180 gpm with limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation, the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

During normal plant operation, the LPSI pumps cannot develop sufficient discharge pressure to overcome RCS pressure and allow flow through the safety injection headers. Thus, during quarterly testing, LPSI flow is routed through a minimum flow recirculation line to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 180 gpm) of the design flow (4200 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined to be impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The LPSI pumps are categorized as Group A since they are normally used to provide shutdown cooling flow during shutdown operations, and occasionally for recirculating the refueling water tank when the unit is at power. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed and differential pressure is used to monitor degradation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group A pump testing for pumps SIA-P01 and SIB-P01 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 180 gpm to establish the specified reference point. Subsection ISTB, ISTB-5200(b)(1) allows the use of bypass test loops to be used for Group A tests. The flow rate through the loop is established at the highest practical flow rate of approximately 180 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5200-1.

Pumps SIA-P01 and SIB-P01 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P01 and SIB-P01 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group A reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-03 was previously authorized for Palo Verde as Relief Request PRR-05 pursuant to 10 CFR 50.55a(f)(6)(i) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP 10CFR50.55a REQUEST PRR-04
Relief Request In Accordance with 10CFR50.55a(f)(5)(iii)

-- Inservice Testing Impracticality –

HPSI Pump Flow Rate Measurement

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
SIA-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIB-P02	High Pressure Safety Injection (HPSI) Pump	2	B

Component/System Function:

The HPSI pumps provide high-pressure coolant injection of borated water into the reactor coolant system under accident conditions. They also provide flow for long-term cooling and flushing to prevent boron precipitation.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5122, "Group B Test Procedure," "Group B tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5122(b), "The differential pressure or flow rate shall be determined and compared to its reference value.

Impracticality of Compliance:

The Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) is impractical since this is a fixed resistance recirculation path of approximately 170 gpm which is measured by limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined to be impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

During normal plant operation, the HPSI pumps cannot develop sufficient discharge pressure to overcome RCS pressure and allow flow through the safety injection headers. Thus, during quarterly testing, HPSI flow is routed through a minimum flow recirculation line to the refueling water tanks. The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 170 gpm) of the design flow (815 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The HPSI pumps are categorized as Group B. Pump SIB-P02 is used only occasionally to recharge the safety injection tanks. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed and differential pressure is used to monitor degradation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group B pump testing for pumps SIA-P02 and SIB-P02 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 170 gpm to establish the specified reference point. ISTB-5100(b)(2) allows the use of bypass test loops to be used for Group B tests. The PVNGS minimum flow recirculation line is designed to meet the pump manufacturers operating specifications. The flow rate through the loop is established at the highest practical flow rate of approximately 170 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5100-1.

Pumps SIA-P02 and SIB-P02 will be comprehensively tested in accordance with ISTB-5123, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P02 and SIB-P02 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group B reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-04 was previously authorized for Palo Verde as Relief Request PRR-06 pursuant to 10 CFR 50.55a(f)(6)(i) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP 10CFR50.55a REQUEST PRR-05
Relief Request In Accordance with 10CFR50.55a(f)(5)(iii)

-- Inservice Testing Impracticality –

Containment Spray Pump Flow Rate Measurement

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
SIA-P03	Containment Spray (CS) Pump	2	A
SIB-P03	Containment Spray (CS) Pump	2	A

Component/System Function:

CS pumps SIA-P03 and SIB-P03 deliver borated water to the containment spray headers, providing containment cooling and pressure control during accident conditions. The CS pumps can also be lined up to provide flow for shutdown cooling.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," ISTB-3300(e)(2), "Reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-5221, "Group A Test Procedure," "Group A tests shall be conducted with the pump operating at a specified reference point. The test parameter value identified in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph."

ISTB-5221(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

ISTB-5221(c), "Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values."

Impracticality of Compliance:

The Code requires the Group A reference point flow rate to be established at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value). It is impractical to meet this requirement since this is a fixed resistance recirculation path of approximately 190 gpm with limited capability permanent plant flow instrumentation. The installed instrumentation is a 0-5000 gpm ultrasonic flowmeter with ± 5% accuracy and does not meet the 2% instrument requirements of Table ISTB-3500-1 for pump testing. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping. To establish the fixed resistance the minimum flow recirculation line contains a flow orifice and a normally open motor-operated valve and solenoid isolation valve. Allowing the flow to remain fixed by the orifice resistance increases the potential for repeatable test results and degradation monitoring rather than attempting to change the resistance based on ultrasonic flowmeter readout fluctuations. When the pump operates on minimum flow recirculation, the specified reference point is essentially achieved by the fixed resistance. With this understanding, there is little value added in replacing the existing 0-5000 gpm, ± 5% ultrasonic flowmeter, or adding instrumentation that meets IST-3510 requirements. The fixed resistance methodology is repeatable from test to test and accomplishes the same result as if flow were being measured and recorded.

Burden Caused by Compliance:

Modifying the minimum flow recirculation line to provide flow indication to meet the ± 2% accuracy requirement as specified in Table ISTB-3500-1 adds little value since the flow is fixed at approximately 190 gpm and differential pressure is used to monitor degradation. The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. The use of an ultrasonic flowmeter with 2% accuracy was evaluated and determined impractical due to the difficulty in establishing an application specific 2% calibration on the SI mini-flow piping.

The normal containment spray flow path cannot be used for testing the CS pumps without spraying down the inside of the containment building and risking damage to important equipment. The RCS injection portion of the shutdown cooling flow path cannot be used for testing during plant operation because the CS pumps are unable to develop sufficient discharge pressure to overcome RCS pressure.

The minimum-flow recirculation flowpath is a fixed resistance circuit containing a flow-limiting orifice capable of passing only a small fraction (approx. 190 gpm) of the design flow (3890 gpm). The permanent plant 0-5000 gpm, ± 5% accuracy, flow instrumentation (permanently mounted ultrasonic flowmeter) has only limited capability, and its accuracy does not meet Table ISTB-3500-1 flow rate 2% accuracy requirements. A larger recirculation flowpath is available; however, this requires an alternate line up and the same limited capability flow instrument exists in this portion of the recirculation line.

The larger recirculation flowpath is capable of carrying higher flow, but routine surveillance testing at less than the full flow reference value is not practical because of the pump rumble range (1800-2800 gpm). Testing in or near the rumble range is not practical because of the potential for equipment damage. Testing at flow rates above the rumble range (> 2800 gpm) is not practical because flow velocities in the recirculation piping would exceed the design criteria.

The CS pumps are categorized as Group A since they are normally used to provide shutdown cooling flow during shutdown operations. Little degradation is expected during plant operation. Thus, the alternate testing will adequately monitor these pumps to ensure continued operability and availability for accident mitigation.

Proposed Alternative and Basis for Use:

During plant operation, quarterly Group A pump testing for pumps SIA-P03 and SIB-P03 shall be conducted at mini-flow conditions using the minimum flow recirculation line fixed resistance of approximately 190 gpm to establish the specified reference point. ISTB-5200(b)(1) allows the use of bypass test loops to be used for Group A tests. The flow rate through the loop is established at the highest practical flow rate of approximately 190 gpm in accordance with ISTB-3300(e)(2). Flow rate will not be measured or recorded. To monitor for degradation, pump differential pressure shall be determined and compared to its reference value and the associated range as specified in Table ISTB-5200-1.

Pumps SIA-P03 and SIB-P03 will be comprehensively tested in accordance with ISTB-5223, "Comprehensive Test Procedure," on a biennial (2-year) frequency as specified in Table ISTB-3400-1.

Pumps SIA-P03 and SIB-P03 are infrequently used pumps. Little degradation is expected during plant power operation when the pumps are idle except for limited operations and testing. Testing the pumps within ± 20% of design flow on a 2-year frequency provides additional information regarding the condition of the pumps.

Conclusion:

10 CFR50.55a(f)((5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4 information to support the determination."

The information provided in this request supports the determination that it is impractical to meet the Code requirements to establish the Group A reference point flow rate at the highest practical flow rate and operate the pump at a specified reference point (i.e., fix the flow to a specified value) since this is a fixed resistance recirculation path with limited capability permanent plant flow instrumentation.

Duration of Proposed Alternative:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Complies with NRC GL 89-04, Position 9. Relief Request PRR-05 was previously authorized for Palo Verde as Relief Request PRR-11 pursuant to 10 CFR 50.55a(f)(6)(i) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP 10CFR50.55a REQUEST PRR-06
Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(ii)

-- On the basis that the proposed alternative provides an acceptable level of quality and safety –

Charging Pump Vibration Measurement

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
CHA-P01	Charging Pump	2	A
CHB-P01	Charging Pump	2	A
CHE-P01	Charging Pump	2	A

Component/System Function:

The charging pumps provide makeup water to the reactor coolant system for chemistry and volume control. They also provide auxiliary spray to the pressurizer and reactor coolant pump seal injection.

Applicable Code Edition and Addenda:

ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3510, "General", ISTB-3510(e), "Frequency Response Range", The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump rotational speed to at least 1000 Hz.

Reason for Request:

The charging pumps are positive-displacement pumps with a constant running speed of 199 rpm (equivalent to 3.3 Hz). Compliance with ISTB-3510(e) would require using vibration instrumentation with a frequency response range of 1.1 Hz to at least 1000 Hz.

A low-speed probe with a frequency response range of 1.6 Hz to 100 Hz was purchased specifically for charging pump testing when the IST requirement for frequency response was one-half pump speed to at least pump shaft rotational speed. However, this probe does not meet the lower bound or the upper bound of the current Code-required frequency response range.

The charging pump bearings are oil-lubricated, sleeve type journal bearings. Because of the high reciprocating loads, the charging pump bearings are not susceptible to oil whirl, which is the primary failure mode that causes vibration below pump shaft rotational speed. There are no other failure mechanisms that manifest themselves with elevated vibration levels in the range of one-third to one-half pump shaft rotational frequency; all the remaining failure modes cause vibration at or above the pump speed. Experience with these pumps confirms this fact. Therefore vibration instrumentation with a frequency response range above 1.6 Hz is acceptable for monitoring vibration of the charging pumps.

The low-speed probe is sensitive to vibration frequencies up to 30 times the running speed of the charging pumps. This is sufficient to identify bearing degradation, mechanical rubs, and other pump problems producing high-frequency vibrations. These pumps are susceptible to degradation mechanisms that would manifest themselves in the 1.6-100 Hz range and not in the extended vibration range required to be monitored by the Code (100-1000 Hz). Therefore, use of the higher frequency vibration probe provides no benefit. The charging pumps are monitored for other symptoms of degradation under the PVNGS Predictive Maintenance Program (see PRR-07 for a description of the PVNGS Predictive Maintenance Program).

Proposed Alternatives and Basis for Use:

The instrumentation used to measure charging pump vibration will have a frequency response range from 1.6 hz to 100 hz. Monitoring in the extended vibration range required to be monitored by the Code (100-1000 Hz) provides no benefit.

Conclusion

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The low-speed probe with a frequency response range of 1.6 Hz to 100 Hz discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Relief Request PRR-06 was previously authorized for Palo Verde as Relief Request PRR-07 pursuant to 10 CFR 50.55a(a)(3)(ii) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

PUMP 10CFR50.55a REQUEST PRR-07
Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

-- On the basis that the proposed alternative provides an acceptable level of quality and safety --

Smooth Running Pumps

Component(s) Affected:

Pump ID	Pump Description	Code Class	Pump Group
AFA-P01	Essential Auxiliary Feedwater Pump (Turbine-Driven)	3	B
AFB-P01	Essential Auxiliary Feedwater Pump (Motor-Driven)	3	B
CTA-P01	Condensate Transfer Pump	3	A
CTB-P01	Condensate Transfer Pump	3	A
ECA-P01	Essential Chilled Water Circulation Pump	3	A
ECB-P01	Essential Chilled Water Circulation Pump	3	A
EWA-P01	Essential Cooling Water Pump	3	A
EWB-P01	Essential Cooling Water Pump	3	A
PCA-P01	Spent Fuel Pool Cooling Pump	3	A
PCB-P01	Spent Fuel Pool Cooling Pump	3	A
SIA-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIB-P01	Low Pressure Safety Injection (LPSI) Pump	2	A
SIA-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIB-P02	High Pressure Safety Injection (HPSI) Pump	2	B
SIA-P03	Containment Spray Pump	2	A
SIB-P03	Containment Spray Pump	2	A
SPA-P01	Essential Spray Pond Pump	3	A
SPB-P01	Essential Spray Pond Pump	3	A

Component/System Function: Various

Applicable Code Edition and Addenda: ASME OM Code 2001 Edition w/2003 Addenda

Applicable Code Requirement(s):

ISTB-3300, "Reference Values," Reference values shall be obtained as follows: (a) Initial reference values shall be determined from the results of testing meeting the requirements of ISTB-3100, Preservice Testing, or from the results of the first inservice test.

ISTB-3300(f), "All subsequent test results shall be compared to these initial reference values or to new reference values established in accordance with ISTB-3310, ISTB-3320, or ISTB-6200(c).

ISTB-6200(a), "Alert Range", "If the measured test parameter values fall within the alert range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1, or Table ISTB-5300-2, as applicable, the frequency of testing specified in ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition is corrected."

ISTB-6200(b), "Action Range", "If the measured test parameter values fall within the required action range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1, or Table ISTB-5300-2, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition is corrected, or an analysis of the pump is performed and new reference values are established in accordance with ISTB-6200(c).

Reason for Request:

Palo Verde has several pumps with vibration parameters readings in the range of ≤ 0.05 ips. Vibration velocities in this range can be significantly affected by hydraulic flow noise and repeatability of the vibration instruments. As a result, Palo Verde could be required to increase the frequency of specified testing when no degradation of the monitored equipment exists.

PVNGS expends considerable resources on preventive and predictive maintenance. One result of these efforts is a number of pumps run very smoothly. For example, many pumps in the PVNGS IST Program would currently be candidates for "smooth-running" status under PRR-07, as shown in the table below. To impose Code-mandated Alert and Required Action values on "smooth-running" pumps unnecessarily penalizes PVNGS for achieving this high level of performance.

Pump	**Typical Vibration Reference Values inch per second (ips)**
Auxiliary Feedwater	0.12 - 0.27
Condensate Transfer *	0.0044 – 0.0883
Essential Chilled Water *	0.0075 – 0.0597
Essential Cooling Water *	0.0295 – 0.0931
Low Pressure Safety Injection *	0.0343 – 0.174
High Pressure Safety Injection	0.0667 – 0.296

Reason for Request:

(Continued)

Pump	**Typical Vibration Reference Values inch per second (ips)**
Containment Spray	0.078 – 0.161
Spent Fuel Pool Cooling *	0.031 – 0.110
Essential Spray Pond *	0.0201 – 0.0864

* Candidates for "smooth-running" status under PRR-007

For displacement reference values less than 0.5 mils, it is noted that the Section XI Code in effect for the first interval of the IST Program (1980 Edition, Winter 1981 Addenda) sets the Alert Range at >1.0 mil and the Required Action Range at >1.5 mil. This implies a minimum reference value of 0.5 mils, which is equivalent to 0.047 ips for 1800 rpm pumps and 0.094 ips for 3600 rpm pumps. The effective reference values proposed for smooth-running pumps are roughly equal to the implied Section XI reference values for 1800 rpm pumps and more conservative than the implied reference values for 3600 rpm pumps. Without proposed alternative, the Alert Ranges for several smooth running pumps will be reduced by a factor of 10.

Proposed Alternatives and Basis for Use:

Vibration parameters that have reference values ≤ 0.05 ips are considered "smooth-running". When vibration velocities are less than 0.05 ips, changes have been shown to be non-significant. To reduce any unnecessary penalty for those pump parameters considered "smooth-running", the Alert and Required Action values for these "smooth-running" parameters will be determined as if their reference value is 0.05 ips; that is, the Alert Range will be 0.125 ips to 0.3 ips, and the Required Action Range will be > 0.3 ips. Candidates for "smooth-running" status will be analyzed per ISTB-3300(g) and ISTB-6400 to verify that use of this relief request will not prevent the detection of significant pump degradation. If any of these parameters are outside normally expected ranges, an evaluation will be performed and appropriate corrective actions will be taken.

The basis for use of these proposed Alert and Required Action ranges is discussed below.

In addition to the Code-mandated monitoring, these pumps are monitored under the PVNGS Predictive Maintenance Program. This program includes the following:

- Spectrum band monitoring
- Bearing acceleration monitoring (on ball and roller bearings only)
- Bearing oil analysis (for oil lubricated bearings)
- Motor Current Signature analysis (for all but the smallest motors)

Proposed Alternatives and Basis for Use (Continued):

The PVNGS Predictive Maintenance (PdM) Program is part of the Preventive Maintenance (PM) Program described in UFSAR Section 17.2.3.11.1.6. The PM Program was developed using RCM, EPRI, and INPO guidelines as well as factoring in PVNGS site-specific experience and regulatory requirements. The PM Program and PdM activities are controlled by plant procedures. Each of these pumps has a maintenance plan documented in the PM Program which describes the PM and PdM activities performed on that pump. The performance of the system associated with each of these pumps is monitored and compared to performance criteria under the PVNGS Maintenance Rule Program. This ensures the continued effectiveness of the PM program to minimize component failures and maintain or improve system performance (balance availability and reliability).

The PVNGS Predictive Maintenance Program uses vibration analysis, lubricant analysis, and infrared thermographic analysis as appropriate, to predict the need for maintenance so that equipment can be reworked prior to failure. The components included in this program include those considered important to safe and reliable plant operation, including certain pumps in the IST Program. The intervals for monitoring are based on manufacturer's recommendations, maintenance history, cost effectiveness, and experience. Although parts of the monitoring, analyses, database, and software used in the Predictive Maintenance Program do not fall under the PVNGS Quality Program, the Predictive Maintenance Program still provides valuable information for assuring the operational readiness of smooth-running pumps.

The vibration analysis program monitors the vibration of rotating machinery. In addition to the vibration at pump bearings, the vibration of the driver (turbine or motor) bearings are also collected and trended. Analyzed parameters and methods include vibration velocity, bearing acceleration, bearing high frequency detection, and spectral analysis.

The lubricant analysis program samples lubricants and analyzes them to identify degradation or negative trends. Most testing is performed at the on-site lubrication laboratory, where capabilities include wear debris, chemical composition, and lubrication cleanliness analysis.

In both the vibration monitoring and lubricant analysis programs, recently acquired data is compared with previous data to detect any indicated degradation of equipment condition. If degradation indicates the reliability of operating equipment may be negatively affected, or if acceptance criteria are no longer being met, appropriate corrective action is taken. Corrective action may include: continuing trending of the degraded condition, if the condition is not considered to be immediately threatening to the equipment and can be corrected during a time window convenient to plant operation; additional testing or monitoring to confirm the suspected degraded condition;

Proposed Alternatives and Basis for Use (Continued):

inspection and repair of the equipment as necessary; changes to preventive maintenance procedures or schedules; or design changes.

The following table contains examples of Unit 1 vibration test result history demonstrates consistent smooth running operation (Unit 2 and 3 are similar):

Unit	Pump	Date	Pump Horizontal	Pump Vertical	Axial
1	CTAP01	7/2/2006	.016	.012	.006
1	CTAP01	9/18/2006	.020	.012	.0079
1	CTAP01	12/11/2006	.021	.014	.007
1	CTAP01	3/8/2007	.019	.012	.0058
1	CTBP01	11/8/2006	.024	.007	.0082
1	CTBP01	12/7/2006	.014	.007	.0095
1	CTBP01	1/29/2007	.016	.006	.011
1	CTBP01	4/25/2007	.017	.007	.009
1	ECAP01	8/22/2006	.036	.034	.010
1	ECAP01	11/13/2006	.044	.027	.0092
1	ECAP01	2/5/2007	.057	.057	.0081
1	ECAP01	5/1/2007	.042	.034	.007
1	ECBP01	8/8/2006	.026	.021	.013
1	ECBP01	10/31/2006	.028	.024	.016
1	ECBP01	1/22/2007	.030	.026	.012
1	ECBP01	4/16/2007	.023	.027	.012
1	EWAP01	8/22/2006	.031	.028	.020
1	EWAP01	11/13/2006	.032	.023	.0214
1	EWAP01	2/6/2007	.033	.031	.0182
1	EWAP01	5/3/2007	.032	.034	.023
1	EWBP01	8/8/2006	.033	.034	.026
1	EWBP01	10/31/2006	.033	.032	.026
1	EWBP01	1/23/2007	.033	.031	.023
1	EWBP01	4/17/2007	.035	.038	.027
1	SIAP01[(b)]	4/11/2004	.033	.048	(a)
1	SIAP01[(b)]	11/29/2005	.047	.053	(a)
1	SIAP01[(b)]	12/8/2005	.043	.061	(a)
1	SIAP01[(b)]	6/1/2006	.057	.071	(a)
1	SIBP01[(b)]	10/4/2002	.031	.032	(a)
1	SIBP01[(b)]	4/23/2004	.044	.060	(a)
1	SIBP01[(b)]	10/16/2005	.027	.035	(a)
1	SIBP01[(b)]	5/29/2006	.041	.062	(a)
1	PCAP01	6/28/2006	.060	.040	.024
1	PCAP01	9/26/2006	.059	.036	.027
1	PCAP01	12/11/2006	.058	.038	.029
1	PCAP01	3/6/2007	.058	.037	.023
1	PCBP01	6/20/2006	.077	.037	.023
1	PCBP01	9/11/2006	.075	.041	.025
1	PCBP01	12/4/2006	.072	.045	.026
1	PCBP01	2/26/2007	.071	.041	.021

Proposed Alternatives and Basis for Use (Continued):

Unit	Pump	Date	Pump Horizontal	Pump Vertical	Axial
1	SPAP01[(b)]	8/22/2006	.049	.027	.0275
1	SPAP01[(b)]	11/14/2006	.052	.023	.0270
1	SPAP01[(b)]	2/6/2007	.055	.027	.0250
1	SPAP01[(b)]	5/3/2007	.049	.027	.0283
1	SPBP01[(b)]	8/7/2006	.092	.047	.0261
1	SPBP01[(b)]	11/1/2006	.088	.027	.0240
1	SPBP01[(b)]	1/23/2007	.090	.030	.029
1	SPBP01[(b)]	4/19/2007	.088	.035	.026

(a) – Inaccessible (b) – vibration readings taken at the motor-

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The revised Alert and Required Action values discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this 10CFR50.55a Request shall be utilized during the Third 10-Year IST Interval.

Precedents:

Relief Request PRR-07 was previously authorized for Palo Verde as Relief Request PRR-08 pursuant to 10 CFR 50.55a(a)(3)(i) for Interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

Cold Shutdown Justification No. 1 (CSJ-01)

AFW Discharge Header Check Valve Open Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
AFAV015	AFW Pump AFA-P01 Discharge Header Check Valve	3	C	AFP-001 / E05
AFBV024	AFW Pump AFB-P01 Discharge Header Check Valve	3	C	AFP-001 / C05

Function These check valves open to provide flowpaths from the respective auxiliary feedwater pump to the auxiliary feedwater headers. They close so that if one pump fails to start after an auxiliary feedwater actuation signal (AFAS), flow from the operating pump is not diverted back through the idle pump.

Alternate Testing These valves will be full-stroke exercised open during cold shutdown periods.

Basis These are simple check valves with no external means of exercising or for determining disc position. Full-stroke exercising open during plant operation is not practical because this would inject cold auxiliary feedwater into the main feedwater lines. The resulting temperature perturbations could lead to unnecessary thermal shock / fatigue damage to the feedwater piping and steam generators, and the cooldown of the reactor coolant system could cause undesirable reactivity variations and power fluctuations.

This CSJ is similar to CSJ-3 in the second interval IST Program and CSJ-2 in the first interval IST Program.

Cold Shutdown Justification No. 2 (CSJ-02)

AFW Header Check Valve Open Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
AFAV079	AFW Header Check Valve	2	C	AFP-001 / E02
AFBV080	AFW Header Check Valve	2	C	AFP-001 / C02

Function

These check valves have a safety function to OPEN to support injection of 650 gpm of auxilary feedwater flow.

The valve also has a safety function to CLOSE in order to isolate containment and to prevent diversion of feedwater flow.

Alternate Testing

These valves will be full-stroke exercised open and closed during cold shutdown periods.

Basis

These are simple check valves with no external means of exercising or for determining disc position. Full-stroke exercising during plant operation is not practical because this would inject cold auxiliary feedwater into the main feedwater lines. The resulting temperature perturbations could lead to unnecessary thermal shock / fatigue damage to the feedwater piping and steam generators, and the cooldown of the reactor coolant system could cause undesirable reactivity variations and power fluctuations.

This cold shutdown justification is similar to CSJ-4 in the second interval IST Program and CSJ-3 in the first interval IST Program.

Cold Shutdown Justification No. 3 (CSJ-03)

Auxiliary Pressurizer Spray Valve Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
CHBHV0203	Auxiliary Pressurizer Spray Isolation Valve	1	B	CHP-001 / H10
CHAHV0205	Auxiliary Pressurizer Spray Isolation Valve	1	B	CHP-001 / H11

Function

These valves have an open safety function to provide flow from the charging pump discharge header to the pressurizer for auxiliary pressurizer spray and a close safety function for spray/pressure control.

Alternate Testing

The auxiliary pressurizer spray isolation valves will be full-stroke exercised open and closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with exercise tests.

Basis

Opening of the auxiliary pressurizer spray isolation valves during plant operation initiates spray flow to the pressurizer. This could cause an RCS pressure transient that could adversely affect plant safety and lead to a plant trip. In addition, the pressurizer spray piping and nozzle would be subjected to unnecessary thermal shock. Opening these valves during plant operation is considered impractical for these reasons.

This cold shutdown justification is similar to CSJ-6 in the second interval IST Program and CSJ-6 in the first interval IST Program.

Cold Shutdown Justification No. 4 (CSJ-04)

Letdown Isolation Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
CHBUV0515	Reactor Coolant Letdown Isolation Valve	1	B	CHP-001 / H15
CHAUV0516	Reactor Coolant Letdown Inbd. Isolation Valve	1	A	CHP-001 / G15
CHBUV0523	Reactor Coolant Letdown Otbd. Isolation Valve	1	A	CHP-001 / F13

Function

These valves open to provide a flowpath for reactor coolant letdown flow - non-safety function. CHBUV0515 and CHAUV0516 have a closed safety function to secure letdown on a Safety Injection Actuation signal (SIAS). CHAUV0516 and CHBUV0523 have a safety function to close on a Containment Isolation Actuation signal (CIAS) signal for containment isolation.

Alternate Testing

These valves will be full-stroke exercised closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with exercise test.

Basis

Closing any of these valves isolates the letdown line from the RCS. During plant operation, this would result in undesirable pressurizer level transients with the potential for a plant trip. If a valve failed to reopen, then a plant shutdown may be required.

This cold shutdown justification is similar to CSJ-9 in the second interval IST Program and CSJ-8 in the first interval IST Program.

Cold Shutdown Justification No. 5 (CSJ-05)

Shutdown Cooling Suction Isolation Valve Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
SICUV0653	Shutdown Cooling Suction Inboard Containment Isolation Valve	1	A	SIP-002 / D03
SIDUV0654	Shutdown Cooling Suction Inboard Containment Isolation Valve	1	A	SIP-002 / D10

Function

These valves have a normally closed safety function to ensure the integrity of the reactor coolant system and to provide containment isolation. They have an open safety function during plant cooldown to initiate shutdown cooling.

Alternate Testing

Each of these valves will be full-stroke exercised open and closed during cold shutdown periods. Stroke time testing will be performed in conjunction with the exercise testing.

Basis

These valves provide pressure barriers between the reactor coolant system pressure and the lesser rated shutdown cooling piping systems. As an installed safety feature they are provided with electrical interlocks that prevent them from being opened when pressurizer pressure is greater than 400 psig. Although this interlock can be overridden, routine operation of these valves with a large differential pressure across the seats is considered impractical due to the risk of damage to the seating surfaces of the valves.

This cold shutdown justification is similar to CSJ-27 in the second interval IST Program,

This cold shutdown justification is similar to CSJ-24 in the first interval IST Program, except that Valves SIAHV0651, SIBHV0652, SIAUV0655 and SIB-UV0656 have been deleted from that CSJ due to the implementation of ASME OM Code Case OMN-1 per VRR-12.

Cold Shutdown Justification No. 6 (CSJ-06)

Instrument Air Containment Isolation Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
IAAUV0002	Instrument Air Supply To Containment Isolation Valve	2	A	IAP-003 / G07

Function

This valve opens to provide flow for instrument air to the containment - non-safety function. The valve has a closed safety function to provide containment isolation.

Alternate Testing

IAAUV0002 will be full-stroke exercised closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with exercise testing.

Basis

Closing this valve during plant operation isolates instrument air to important equipment within the containment building, including the pressurizer spray control valves and letdown isolation valves. This would, in turn, risk pressurizer level and pressure transients with a potential for a plant trip. If IAAUV0002 were to fail to re-open, an expedited plant shutdown would be required.

This cold shutdown justification is similar to CSJ-13 in the second interval IST Program and CSJ-13 and CSJ-14 in the first interval IST Program.

Cold Shutdown Justification No. 7 (CSJ-07)

Reactor Head Vent and Pressurizer Vent Valve Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
RCAHV0101	Reactor Vessel Vent Valve	2	B	RCP-001 / G15
RCBHV0102	Reactor Vessel Vent Valve	2	B	RCP-001 / G15
RCAHV0103	Pressurizer Vent Valve	2	B	RCP-001 / G14
RCBHV0105	Reactor Coolant System Common Vent Valve To RDT	2	B	RCP-001 / G13
RCAHV0106	Reactor Coolant System Common Vent Valve To Containment	2	B	RCP-001 / G13
RCBHV0108	Pressurizer Vent Valve	2	B	RCP-001 / G13
RCBHV0109	Pressurizer Vent Valve	2	B	RCP-001 / G13

Function

These valves have an open safety function to remotely vent non-condensible gasses from the reactor vessel and/or pressurizer steam space. They can also be used to depressurize the RCS. They have a safety function to close for reactor coolant system integrity.

Alternate Testing

These valves will be full-stroke exercised open and closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with the exercise testing.

Basis

These valves are administratively controlled in the keylocked closed position with the power supply disconnected to prevent inadvertent operation. Since these are reactor coolant system boundary valves, failure of a valve to close or significant RCS leakage following closure can result in a loss of coolant in excess of the limits imposed by the Technical Specifications leading to a plant shutdown. Furthermore, if a valve were to fail open or valve indication fail to show the valve returned to the fully closed position after exercising, it is likely that a plant shutdown would be required. Note also that Technical Specifications require that these valves be closed in Modes 1-4.

This cold shutdown justification is similar to CSJ-15 in the second interval IST Program and CSJ-16 in the first interval IST Program.

Cold Shutdown Justification No. 8 (CSJ-08)

Feedwater Isolation Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
SGBUV0130	Inbd. FWIV to SG #1 Downcomer	2	B	SGP-002 / G11
SGBUV0132	Inbd. FWIV to SG #1 Economizer	2	B	SGP-002 / E12
SGBUV0135	Inbd. FWIV to SG #2 Downcomer	2	B	SGP-002 / C11
SGBUV0137	Inbd. FWIV to SG #2 Economizer	2	B	SGP-002 / A12
SGAUV0172	Otbd. FWIV to SG #1 Downcomer	2	B	SGP-002 / G12
SGAUV0174	Otbd. FWIV to SG #1 Economizer	2	B	SGP-002 / E12
SGAUV0175	Otbd. FWIV to SG #2 Downcomer	2	B	SGP-002 / C12
SGAUV0177	Otbd. FWIV to SG #2 Economizer	2	B	SGP-002 / A12

Function

The main feedwater isolation valves (FWIVs) are normally open during steaming operations to provide flowpaths for main feedwater flow to the steam generators - non-safety function. They have a closed safety function to isolate and maintain the integrity of the steam generators and to secure feeding a faulted steam generator in the event of a steam leak inside containment.

Alternate Testing

Each of these valves will be full-stroke exercised closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with the exercise testing.

Basis

Closing any of these valves isolates the associated feedwater header. During plant operation, isolation of a feedwater header would require a significant power reduction and could result in unacceptable steam generator level and reactor power transients with the potential for a plant trip.

The downcomer isolation valves do not have partial-stroke capability, however the economizer isolation valves are capable of partial stroke exercising. Part-stroke exercising is not considered practical because of the risk of full closure. This risk was recognized by NUREG-1432, Vol 1, Rev. 1, "Standard Technical Specifications - Combustion Engineering Plants Specifications", which states that "MFIVs should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power" as the basis for the 18-month test frequency specified by SR 3.7.3.1. Nevertheless, part-stroke exercising continues to be performed as an augmented test to satisfy System and Maintenance Engineering's desire to periodically exercise the 4-way pilot valves to confirm continued operability.

This cold shutdown justification is similar to CSJ-18 in the second interval IST Program and CSJ-17 and CSJ-26 in the first interval IST Program.

Cold Shutdown Justification No. 9 (CSJ-09)

Main Steam Isolation Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
SGEUV0170	Main Steam Isolation Valve From Steam Gen. #1	2	B	SGP-001, Sh. 1 / G10
SGEUV0171	Main Steam Isolation Valve From Steam Gen. #2	2	B	SGP-001, Sh. 1 / D10
SGEUV0180	Main Steam Isolation Valve From Steam Gen. #1	2	B	SGP-001, Sh. 1 / F10
SGEUV0181	Main Steam Isolation Valve From Steam Gen. #2	2	B	SGP-001, Sh. 1 / B10

Function

These valves are normally open during steaming operations to provide flowpaths for steam flow to the main turbine generators and associated auxiliaries - non-safety function. They have a closed safety functionn to isolate and maintain the integrity of the steam generators.

Alternate Testing

Each of these valves will be full-stroke exercised closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with exercise testing.

Basis

Closing any of these valves isolates the associated steam header. During plant operations, isolation of a main steam header would require a significant power reduction and could result in unacceptable steam generator level and reactor power transients with the potential for a plant trip.

The main steam isolation valves are capable of partial stroke exercising. Part-stroke exercising is not considered practical because of the risk of closure. This risk was recognized by NUREG-1432, Vol 1, Rev. 1, "Standard Technical Specifications - Combustion Engineering Plants Specifications", which states that "MSIVs should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power" as the basis for the 18-month test frequency specified by SR 3.7.2.1. Nevertheless, part-stroke exercising continues to be performed as an augmented test to satisfy System and Maintenance Engineering's desire to periodically exercise the 4-way pilot valves to confirm continued operability.

This cold shutdown justification is similar to CSJ-19 in the second interval IST Program and CSJ-25 in the first interval IST Program.

Cold Shutdown Justification No. 10 (CSJ-10)

SIT Vent Valve Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
SIAHV0605	Safety Inj. Tank 2A Vent Valve	2	B	SIP-002 / F15
SIAHV0606	Safety Inj. Tank 2B Vent Valve	2	B	SIP-002 / F12
SIAHV0607	Safety Inj. Tank 1A Vent Valve	2	B	SIP-002 / F07
SIAHV0608	Safety Inj. Tank 1B Vent Valve	2	B	SIP-002 / F04
SIBHV0613	Safety Inj. Tank 2A Vent Valve	2	B	SIP-002 / E15
SIBHV0623	Safety Inj. Tank 2B Vent Valve	2	B	SIP-002 / E12
SIBHV0633	Safety Inj. Tank 1AVent Valve	2	B	SIP-002 / E07
SIBHV0643	Safety Inj. Tank 1B Vent Valve	2	B	SIP-002 / E04

Function

These valves have a normally closed safety function to ensure the integrity of the associated safety injection tank (SIT) so that the required nitrogen overpressure is maintained. They have an open safety function to reduce the nitrogen pressure in the SITs during RCS depressurization to preclude nitrogen injection into the RCS.

Alternate Testing

Each of these valves will be exercised open and closed during cold shutdown periods. Stroke time testing and fail-safe testing will be performed in conjunction with exercise testing.

Basis

These valves are normally closed during plant operation. Plant technical specifications require that power be removed from the valves, and that the SIT nitrogen cover gas pressure be maintained within the required range. Exercising a valve during operation would render the associated SIT inoperable if the cover gas pressure were reduced below the required range. A valve failing open during testing would completely depressurize the SIT and result in an expedited plant shutdown.

This cold shutdown justification is similar to CSJ-26 in the second interval IST Program and CSJ-22 in the first interval IST Program.

Refueling Outage Justification No. 1 (ROJ-01)

Containment Refueling Purge Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
CPAUV0002A	Containment Purge Supply Otbd. Isolation Valve	2	B	CPP-001 / D06
CPAUV0002B	Containment Purge Exhaust Inbd. Isolation Valve	2	B	CPP-001 / E03
CPBUV0003A	Containment Purge Supply Inbd. Isolation Valve	2	B	CPP-001 / D05
CPBUV0003B	Containment Purge Exhaust Otbd. Isolation Valve	2	B	CPP-001 / E02

Function

These 42" valves open to provide flowpaths for containment ventilation during shutdown periods - non-safety function. They have a safety function to close on a containment purge isolation actuation signal (CPIAS) during a loss of shutdown cooling or a fuel handling accident in containment. They are locked closed and blind flanged during plant operation (Modes 1-4).

Alternate Testing

These valves will be full-stroke exercised closed during refueling outage periods. Stroke time testing will be performed in conjunction with exercise test.

Basis

Per PVNGS Technical Specification 3.6.3.1, these valves must remain closed during plant operation. These valves are administratively maintained in the closed position at all times when the plant is operating in Modes 1-4. The valves are not capable of closing against accident pressure. The outboard valves are blocked closed by the installation of blind flanges during Mode 1-4. Thus they are not required to operate (stroke closed) during operational periods. Due to the large size of these valves and the potential for damage as a result of frequent cycling, it is not prudent to operate them more than is absolutely necessary. The blind flanges are only removed to place the refueling purge system inservice.

This refueling outage justification is similar to CSJ-10 in the second interval IST Program and CSJ-11 in the first interval IST Program. The change to a refueling interval is based on the addition of blind flanges to ensure closure during plant operation.

Refueling Outage Justification No. 2 (ROJ-02)

RCP Seal Bleed-Off Isolation Valve Closed Exercising

Valve ID	Valve Description	Code Class	Category	Drawing / Coord.
CHBUV0505	Reactor Coolant Pump Seal Bleed-off Otbd. Isolation Valve	2	A	CHP-002 / H13
CHAUV0506	Reactor Coolant Pump Seal Bleed-off Inbd. Isolation Valve	2	A	CHP-002 / H14

Function

These valves are normally open during plant operation to provide a flowpath for seal bleed-off from the reactor coolant pumps (RCPs) – non-safety function. They have a closed safety function for containment isolation.

Alternate Testing

These valves will be exercised closed during refueling outage periods. Stroke time testing and fail safe testing will be performed in conjunction with exercise testing.

Basis

These air-operated valves are electrically interlocked so that they cannot be closed when any of the reactor coolant pumps are in operation. Closing either of these valves during RCP operation would interrupt bleed-off flow from the RCP seals and could result in damage to the seals. Thus testing these valves during plant operation would require the unnecessary shutdown of all of the reactor coolant pumps.

Operation of seal injection is also maintained during cold shutdown periods.

It is noted that paragraph 3.1.1.4 of NUREG-1482, Revision 1, permits deferral of tests that require shutdown of RCPs until refueling outages.

This refueling outage justification is similar to CSJ-32 in the second interval IST Program and CSJ-7 in the first interval IST Program. The change to a refueling outage interval is based on seal injection being used during cold shutdown periods.

VALVE RELIEF REQUEST VRR-01
Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

Code Case OMN-1 - MOV Exercising and Stroke Timing

Component(s) Affected:	Motor-operated valve assemblies currently included in the Palo Verde Nuclear Generating Station (PVNGS) Motor-Operated Valve Program
Component/System Function:	Various
Applicable Code Edition and Addenda:	ASME OM Code 2001 Edition w/2003 Addenda
Applicable Code Requirement(s):	ISTA-3130, "Application of Codes Cases", ISTA-3130(b) states, Code Cases shall be applicable to the edition and addenda specified in the test plan. ISTC-3500, "Valve Testing Requirements" states; Active and passive valves in the categories defined in ISTC-1300 shall be tested in accordance with the paragraphs specified in Table ISTC-3500-1 and the applicable requirements of ISTC-5100 and ISTC-5200. ISTC-3700, "Position Verification Testing" states; Valves with remote position indicators shall be observed locally at least once every 2 years to verify the valve operation is accurately indicated. ISTC-5120, "Motor-Operated Valves", ISTC-5121 (a) states; Active valves shall have their stroke times measured when exercised in accordance with ISTC-3500.
Reason for Request:	Code Case OMN-1, Revision 0 provides alternative rules to those of OM Code, Subsection ISTC, for preservice and inservice testing to assess the operational readiness of certain electric motor-operated valve assemblies in light-water reactor power plants. However, RG 1.192 has not yet extended its use to the 2001 Edition w/2003 Addenda of the OM Code which is the basis for the planned third 10-year IST program at Palo Verde.
Proposed Alternatives and Basis for Use:	Pursuant to ASME Code Case OMN-1 and the guidelines provided in NUREG-1482, Revision 1, Section 4.2.5, PVNGS proposes to continue implementation of Code Case OMN-1 in lieu of the stroke-time provisions specified in ISTC-5120 for MOVs. Code Case

Proposed Alternatives and Basis for Use:

(Continued)

OMN-1 has been determined by the NRC to provide an acceptable level of quality and safety when implemented in conjunction with the conditions imposed in RG 1.192.

The conditions specified in RG 1.192 are as follows:

Regulatory Guide 1.192, Operation and Maintenance Code Case Acceptability, ASME OM Code, dated June 2003 states that licensees may use Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants," Revision 0, in lieu of the provisions for stroke-time testing in Subsection ISTC of the 1995 Edition up to and including the 2000 Addenda of the ASME OM Code when applied in conjunction with the provisions for leakage rate testing in, as applicable, ISTC 4.3 (1995 Edition with the 1996 and 1997 Addenda) and ISTC-3600 (1998 Edition with the 1999 and 2000 Addenda). In addition, licensees who continue to implement Section XI of the ASME BPV Code as their Code of Record may use OMN-1 in lieu of the provisions for stroke-time testing specified in Paragraph 4.2.1 of ASME/ANSI OM Part 10 as required by 10 CFR 50.55a(b)(2)(vii) subject to the conditions in this Regulatory Guide (RG) 1.192. Licensees who choose to apply OMN-1 are required to apply all its provisions.

The relevant provisions are as follows:

(1) The adequacy of the diagnostic test interval for each motor-operated valve (MOV) must be evaluated and adjusted as necessary, but not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OMN-1.

(2) When extending exercise test intervals for high risk MOVs beyond a quarterly frequency, licensees must ensure that the potential increase in Core Damage Frequency (CDF) and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement.

(3) When applying risk insights as part of the implementation of OMN-1, licensees must categorize MOVs according to their safety significance using the methodology described in Code Case OMN-3, "Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants," with the conditions discussed in RG 1.192 or use other MOV risk ranking methodologies accepted by the NRC on a plant specific or industry-wide basis with the conditions in the applicable safety evaluations.

Proposed Alternatives and Basis for Use:

(Continued)

In addition the following implementation clarifications are necessary:

OMN-1, RO, Para. 3.1, Design Basis Verification Test
Design Basis Verification Testing was completed during plant startup testing and in response to NRC GL 89-10 testing requirements, which meet the intent of this CC requirement.

OMN-1, RO, Para. 3.2, Preservice Testing
Preservice Testing was performed pursuant to NRC GL 89-10 testing requirements, which meet the intent of this CC requirement.

OMN-1, RO, Para. 3.3 (b) Inservice Test
Because of the extensive PVNGS MOV performance history, some As-Found MOV testing can be waived by a documented Engineering evaluation, e.g., if a modification to the valve or actuator will be performed or if valve maintenance is planned (such as valve repacking), and the activity will require a post maintenance diagnostic test to return the MOV to service. This provision will not apply if there is reason to suspect the MOV is not operating properly prior to the maintenance activity.

OMN-1, RO, Para. 3.3 (c) Inservice Test
PVNGS performed differential pressure testing per NRC GL 89-10 and also participated in the JOG differential pressure testing program (i.e. dynamic testing) that has been completed. The mix of static and dynamic testing at PVNGS in the future will be static testing with additional dynamic testing performed as required by the PVNGS MOV Program to address MOV modifications.

OMN-1, RO, Para. 3.3.1, Inservice Test Interval
PVNGS has committed to the JOG program as part of its response to NRC GL 96-05. Inservice Test Intervals will be established based on MOV margin and the valve's risk/safety significance in accordance with JOG program requirements. PVNGS is currently implementing the JOG Interim Test Program per MPR 1807. PVNGS will implement the final JOG Periodic Verification Program per MPR 2524-A as noted in the NRC SER on the JOG program.

OMN-1, RO, Para. 3.4 Effect of MOV Replacement, Repair, or Maintenance
Diagnostic test results within the MOV Program setpoint bands are satisfactory and do not require analysis.

Proposed Alternatives and Basis for Use:

OMN-1, RO, Para. 3.5 Grouping of MOVs for Inservice Testing
PVNGS elects not to use Grouping of MOVs for Inservice Testing

(Continued)

OMN-1, RO, Para. 3.7 Risk Basis Criteria for MOV Testing
PVNGS is currently not planning to implement a Risk Informed Program for its IST program. As noted above, PVNGS uses risk/safety significance and MOV margin as part of the JOG program to establish MOV testing frequency.

OMN-1, RO, Para. 6.3 Evaluation of Data and
Para. 6.4 Determination of MOV Functional Margin
PVNGS utilizes the JOG Program criteria for determining MOV test frequency. The MOV test frequencies have been established to ensure MOV setpoints and MOV margins are maintained over the MOV test interval which meets the intent of these CC sections.

OMN-1, RO, Para. 6.4.1 Determination of Valve Operating Requirements
A Stem Factor shall be determined for rising stem valves whenever stem thrust and stem torque are measured. It is not possible to measure thrust and torque on all rising stem valves.

OMN-1, RO, Para. 6.4.2.1 Available Output Based on Motor Capabilities and CC OMN-1 Para. 6.4.2.2 Available Output Based on Torque Switch Setting
Actuator output capabilities are determined as an integral part of the MOV design basis calculations and are not performed as part of the evaluation of MOV test data. This applies to all actuators and includes those actuators set up based on limit switches.

For actuators set up based on torque switches, available output includes torque measurement uncertainty (or displacement uncertainty if spring pack displacement is used) and torque switch repeatability.

OMN-1, RO, Para. 6.4.3 Calculation of Functional Margin
Margin is calculated as a percentage (vice difference in thrust or torque between available output and valve operating requirements).

OMN-1, RO, Para. 6.4.4 Determination of MOV Test Interval
As noted above for CC OMN-1 Para 3.3.1, test interval is based on the NRC approved JOG program.

OMN-1, RO, Para. 9.1 Test Information
Test Information relevant to the MOV being tested and relevant test parameters will be recorded electronically with the test trace and/or

Proposed Alternatives and Basis for Use:

(Continued)

on the test data sheet. MOV configuration data not directly related to testing, e.g., name plate information; breaker setting, etc. are maintained in plant records.

Code Case OMN-1, RO, should be considered acceptable for use with OM Code-2001 Edition w/2003 Addenda as the Code of record. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), PVNGS requests relief from the specific ISTC Code requirements identified in this relief request.

Conclusion:

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i)The proposed alternatives would provide an acceptable level of quality and safety, or
(ii)Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

The continued use of ASME Code Case OMN-1, Revision 0, as discussed in this relief request provides an acceptable level of quality and safety. Therefore, APS requests that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the Third Ten Year IST Interval.

Precedents:

Relief Request VRR-01 was previously authorized for Palo Verde as Relief Request VRR-12 pursuant to 10 CFR 50.55a(a)(3)(i) for interval 2 in the NRC Safety Evaluation dated July 8, 1999. (TAC NOS. MA0757, MA0758 and MA0759) (ADAMS Accession No. 9907150128)

References:

NUREG-1482, Revision 1, Section 4.2.5, "Alternatives to Stroke-Time Testing"

Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code", Table 2, "Conditionally Acceptable OM Code Cases"

OM Code-2001 Edition w/2003 Addenda, Paragraph ISTC-5120, "Motor Operated Valves"

OM Code-2001 Edition w/2003 Addenda, Paragraph ISTA-3130, "Application of Code Cases"

Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants"

Interval 2 NRC SER dated 7/8/1999

Notes, Legends, Definitions, and Abbreviations

Notes

Note 1 Whenever check valve is disassembled for inspection, perform a manual exercise per 73ST-9ZZ25.

Note 2 Manual exercise per 73ST-9ZZ25 can be substituted for the regular check valve exercise test.

Note 3 Perform a partial stroke exercise with flow after reassembly, if practical.

Note 4 Check valve is tested under the PVNGS Check Valve Condition Monitoring Program and 73DP-9XI05.

Note 5 As provided for in ASME OM Code Case OMN-1, MOVs are tested in the PVNGS 89-10 Program in lieu of the stroke time test and valve position verification surveillances that were performed in the past. This Code Case requires Active MOVs to be exercised once per fuel cycle (1CY). Additional exercising is performed at the Licensee's discretion (refer to VRR-01) as delineated in the component tables. Post maintenance retest requirements for MOVs are specified in 39DP-9ZZ04 Appendix G.

Note 6 A 42-inch refueling purge valve is not a required containment isolation valve when its flow path is isolated with a blind flange tested in accordance with TS SR 3.6.1.1 (TS LCO 3.6.3 Note 5)

Pump Table Legend

Pump ID Plant equipment identifier. The first 2 letters in the ID indicate the system.

Description Name / description of the pump

Code Class ISI classification of the pump: 1, 2, 3, or N (non-class)

Drawing / Coord. Piping and Instrument Diagram number and coordinates showing the pump

Test Parameters The table indicates the frequency which pump speed, pressure, flow rate, and vibration are measured, along with any applicable relief requests

Test Procedure Procedure(s) which satisfy the testing requirements

Remarks Additional explanation or clarification, if required

Valve Table Legend

Valve ID Plant equipment identifier. The first 2 letters in the ID indicate the system.

Description Name / description of the valve

Drawing Piping and Instrument Diagram number showing the valve

Coord Coordinates where the valve is located on the drawing

Sht# Drawing sheet number

Code Class ISI classification of the valve: 1, 2, 3, or N (non-class)

Size Nominal pipe size of the valve, in inches

Type Valve type:

BF	Butterfly Valve
CK	Check Valve
DI	Diaphragm valve
GA	Gate Valve
GL	Globe Valve
PSV	Pressure Safety Relief Valve
RD	Rupture Disk
VR	Vacuum Relief

Act. Valve actuator type:

AO	Air Operated
HY	Hydraulically Operated
MA	Manually Operated
MO	Motor Operated
SA	Self Actuating
SO	Solenoid Operated

Cat. A, B, C, or D, per ISTC-1300, "Valve Categories"

A/P A (active) or P (passive) valve, per ISTA-2000, "Definitions."

S.P. Safety position: O (open), C (closed), or OC (both open and closed).

Test Test(s) performed on the valve. The first two letters indicate the type of test:

AJ	Appendix J Leak Test
BD	Bi-Directional Check Valve Test (non-safety direction)
CV	Check Valve Test (safety function direction)
FS	Full Stroke Exercise Test
FT	Fail Safe Test
LT	Leak Test other than an Appendix J Test
PS	Partial Stroke Exercise Test
REP	Replacement
ST	Stroke Time Test
SV	Pressure Safety Relief Valve Test
VP	Valve Position Indication Test

A third letter is used where required to indicate stroke direction: O (open) or C (closed), or a special activity, like I (inspection).

Freq Frequency at which a test is performed:

- CLR Per the Containment Leak Rate Program
- CMP Per the Check Valve Condition Monitoring Program
- CSD Cold Shut Down
- QTR Quarterly
- RFO Refueling Outage
- STF Special Test Frequency
- 6M Once per 6-months
- 1YR Once per year
- 18M Once per 18 months
- 1CY Once per fuel cycle
- 2YR Once every 2 years
- 5YR Mandatory Appendix I-1320 (at least once every 5 years)
- 10Y Mandatory Appendix I-1350 (at least once every 10 years)

Procedure Procedure in which the test is performed

CSJ/ROJ/VRR Applicable Cold Shutdown Justification, Refueling Outage Justification, or Valve Relief Request

Remarks Additional explanation or clarification, if required

Definitions

Augmented Components or tests included within the IST Program at the discretion of IST Engineering. Augmented components are generally tested in accordance with the Code to the extent practical; however, deviations from Code requirements do not require relief.

Abbreviations

ACU Air Conditioning Unit

AF Auxiliary Feedwater system

AFAS Auxiliary Feedwater Actuation Signal

AFW Auxiliary Feedwater

ANII Authorized Nuclear Inservice Inspector

AOV Air-Operated Valve

ASME American Society of Mechanical Engineers

BAMP Boric Acid Makeup Pump

CC Code Case

CEDM Control Element Drive Mechanism

CH Charging system

CIAS Containment Isolation Actuation Signal

CIV Containment Isolation Valve

CP Containment Purge system

CPIAS Containment Purge Isolation Actuation Signal

CS Containment Spray

CSD Cold Shutdown

CSJ Cold Shutdown Justification

CST Condensate Storage Tank

CT Condensate Transfer system

DF Diesel Fuel system

DG Diesel Generator system

DW Demineralized Water system

EC Essential Chilled Water system

EDG	Emergency Diesel Generator
ESF	Engineered Safety Features
EW	Essential Cooling Water system
FP	Fire Protection system
FWIV	Feedwater Isolation Valve
GA	Service Gas system
GL	Generic Letter
GR	Gaseous Radwaste system
H2	Hydrogen
HC	Containment HVAC system
HP	Hydrogen Purge system
HPSI	High Pressure Safety Injection
HVAC	Heating, ventilation, and air conditioning
IA	Instrument Air system
ISI	Inservice Inspection
IST	Inservice Testing
LCO	Limiting Condition for Operation
LOCA	Loss of Coolant Accident
LPSI	Low Pressure Safety Injection
LTOP	Low Temperature Over Pressure
MFIV	Main Feedwater Isolation Valve
MOV	Motor-Operated Valve
MSIV	Main Steam Isolation Valve
NC	Nuclear Cooling Water system
PASS	Post-Accident Sampling System
PC	Fuel Pool Cooling
PEN.	Penetration
PRA/RA	Probablistic Risk Assessment/Risk Assessment
PRR	Pump Relief Request
PVNGS	Palo Verde Nuclear Generating Station
RC	Reactor Coolant system
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RD	Radioactive Drains
RDT	Reactor Drain Tank
RMW	Reactor Makeup Water
ROJ	Refueling Outage Justification
RWT	Refueling Water Tank
SDC	Shutdown Cooling
SG	Steam Generator
SG	Main Steam system
SI	Safety Injection system
SIAS	Safety Injection Actuation Signal
SIT	Safety Injection Tank
SOV	Solenoid-Operated Valve
SP	Essential Spray Pond system
SR	Surveillance Requirement
SS	Sampling system
TDAFW	Turbine-Driven Auxiliary Feedwater Pump
TRM	Technical Requirements Manual
TS	Technical Specification
TSR	TRM Surveillance Requirement
VCT	Volume Control Tank
VRR	Valve Relief Request
WC	Normal Chilled Water system