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Manager of
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October 10, 2003

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

Subject: **Docket Nos. 50-361 and 50-362**
Revised Relief Requests
ASME Code Update for the Third Ten-Year Interval,
Inservice Testing Program
San Onofre Nuclear Generating Station Units 2 and 3

Reference: Letter from A. E. Scherer (SCE) to the Document Control Desk (NRC) dated June 18, 2003; Subject Docket Nos. 50-361 and 50-362, ASME Code Update for the Third Ten-Year Interval, Inservice Testing Program, San Onofre Nuclear Generating Station Units 2 and 3

Dear Sir or Madam:

This letter provides revised relief requests in support of the Southern California Edison (SCE) Inservice Testing (IST) Program for the third ten-year interval for San Onofre Nuclear Generating Station (SONGS) Units 2 and 3. Additionally, this letter is to inform the NRC that the SONGS Units 2 and 3 inservice testing (IST) program second ten-year interval is being extended by an additional four months to end on April 30, 2004, consistent with Section XI, Article IWA-2430 (c) of the 1989 Edition of the ASME Code, and no addenda. The third ten-year interval will begin on May 1, 2004 and will end on August 17, 2013.

By the referenced letter SCE submitted the ten-year American Society of Mechanical Engineers (ASME) Operations and Maintenance (OM) Code update which informed the NRC that the ASME OM Code for the third ten-year interval IST program shall be the 1998 Edition through the 2000 Addenda. This referenced ASME OM Code update submittal also included 6 relief requests (IST-3-R-1, IST-3-P-1, IST-3-P-2, IST-3-P-3, IST-3-P-4, and IST-3-V-1).

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Enclosures 1 through 5 contain revisions to IST-3-R-1, IST-3-P-1, IST-3-P-2, IST-3-P-3, and IST-3-V-1. These enclosed revisions respond to questions from the NRC staff and address the new ASME OM Code requirement to perform comprehensive pump testing. SCE withdraws relief request IST-3-P-4. Additionally, SCE agrees to a biennial frequency for comprehensive pump testing unless prior NRC approval is obtained through a future relief request.

If you have any questions or would like additional information concerning this subject, please call Mr. Jack Rainsberry (949) 368-7420.

Sincerely,

Enclosures

cc: B. S. Mallett, Regional Administrator, NRC Region IV
B. M. Pham, NRC Project Manager, San Onofre Units 2, and 3
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3

ENCLOSURE 1

Relief Request

IST-3-R-1, Revision 1

Risk Informed Inservice Testing

2nd 10-Year Relief Request Number IST-001

Approved by NRC in 2nd 10-Year Interval

10 CFR 50.55a Request Number IST-3-R-1 Rev. 1

Information to Support NRC Re-Approval of a 10CFR 50.55a Request for Use During a New 10-Year Interval Inservice Testing Program

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1.0 Previous 10 CFR 50.55a Request Approved by NRC

Relief Request Number: IST-001

ASME Code Components Affected:

Various (Refer to Table 2.3-1 of the Station Risk-Informed Inservice Testing Program), References 1 and 2.

References:

1. Letter from A. E. Scherer (SCE) to the Document Control Desk (NRC) dated December 30, 1998; Subject: Docket Nos. 50-361 and 50-362, Request to implement a Risk-informed Testing Program During the Remainder of the Second Ten-Year Interval, San Onofre Nuclear Generating Station, Units 2 and 3.

2. Letter from A.E. Scherer (SCE) to the Document Control Desk (NRC) dated November 30, 1999; Subject Docket Nos. 50-361 and 50-362, Risk-informed Inservice Testing (TAC Nos. MA 4509 and MA 4510) San Onofre Nuclear Generating Station, Units 2 and 3.

3. Letter from Stephen Dembek (NRC) to Harold B. Ray (SCE) dated March 27, 2000; Subject: San Onofre Nuclear Generating Station (SONGS), Units 2 and 3 – Risk-Informed Inservice Testing Program for Pumps and Valves (TAC NOS. MA 4509 and MA 4510).

2.0 Applicable Code and Addenda

Code-1998 Code for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000.

3.0 Changes to the Applicable ASME Code Section

OM-1 of OM Code-1987, OMa-1988, OMb-1999 has been incorporated as a mandatory Appendix 1 of the OM Code 1998, OMa-1999, OMb-2000. Relief valves are excluded from the Risk Informed Inservice Testing (RI-IST) program because Southern California Edison (SCE) plans to continue to test these components at the prescribed intervals of OM Code 1998, OMa-1999, OMb-2000.

OM-6 of OM Code-1987, OMa-1988, OMb-1999 has been renumbered as ISTB of the OM Code 1998, OMa-1999, OMb-2000. ISTB defines pump categories as Group A and Group B pumps and their test frequencies are addressed in ISTB-3400. Both Group A and B pumps are subject to biennial comprehensive pump tests as tabulated in Table ISTB-3400-1. Instrument accuracies associated with respective pump tests are addressed in ISTB-3500 and summarized in Table ISTB-3500-1. Inservice Testing of centrifugal pumps, except vertical line shaft centrifugal pumps, shall be in accordance with ISTB-5100; vertical shaft centrifugal pumps shall be tested in accordance with ISTB-5200; and positive displacement pumps shall be tested in accordance with ISTB-5300. ISTB-5123, ISTB-5223, and ISTB-5323 address comprehensive testing which is not addressed in OM-6 of OM Code-1987, OMa-1988, OMb-1999. Frequency of Inservice Testing is tabulated in Table ISTB-3400-1.

OM-10 of OM Code-1987, OMa-1988, OMb-1999 has been renumbered as ISTC of the OM Code 1998, OMa-1999, OMb-2000. Per ISTC-1200, skid-mounted valves are excluded from Subsection ISTC, provided they are tested as part of the major component. ISTC-5000, Specific Testing Requirements, and associated Subsections have been added. ISTC-3540 Manual Valves states that manual valves shall be full stroke exercised at least once every 5 years except where adverse conditions may require the valve to be tested more frequently. ISTC-3522 Category C Check Valves requires check valve exercise tests to include open and close tests that are performed at an interval when it is practicable to perform both tests. Open and close tests are not required to be performed at the same time if they are performed within the same interval.

In the 2nd 10-year interval, SCE in Relief Request IST-001, presented an alternative testing strategy that will apply to successive 10-year intervals as discussed in 10 CFR 50.55a(f)(4)(ii). This relief was granted by the NRC on March 27, 2000 – Reference 3. The Code changes cited above do not affect the Risk Informed Inservice Test Program because Inservice Testing of High Safety Significant Components (HSSC) will be conducted at Code specified frequencies using approved Code methods. L-H components [Low Safety Significant Components (LSSC) with low Fussell-Vesely and high Risk Achievement Worth] and LSSC will be tested at extended test frequencies determined in accordance with the RI-IST program description.

4.0 Component Aging Factors

Component aging factors do not have an effect on Risk Informed Inservice Testing because the intent of Inservice Testing is to detect component degradation regardless of the component age. Subsections - ISTA, ISTB, ISTC and Appendix 1 of the OM Code do not address component aging.

5.0 Changes In Technology for Testing the Affected ASME Code Components(s)

The qualitative and quantitative data collected by instruments used in the Risk Informed Inservice Testing program is not affected by any change in technology.

6.0 Proposed alternative and Basis for Use

Alternate Testing: Implement a Risk Informed Inservice Testing Program per the guidance detailed in Regulatory Guide 1.175, "An Approach for Plant-Specific, Risk Informed Decision making: Inservice Testing."

Group A pump, Group B pump, and Valve testing shall be performed in accordance with the requirements stated in ASME OM Code-1998 for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000, except that the test intervals are determined per the methodology outlined in Enclosure 2 of Relief Request IST-001 (References 1 and 2).

Note: Comprehensive pump testing will be performed at the OM Code, ISTB Specified frequency (Biennially).

Basis for Relief: The proposed alternative testing strategy provides an acceptable level of quality and safety because key safety principles of defense-in-depth and safety margins are maintained. The impact of the proposed changes to the testing strategy has been evaluated and meets the criteria specified in the acceptance guidelines of Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." The complete description and supporting bases reside in the San Onofre Nuclear Generating Station Risk Informed Inservice Testing Program, submitted to the NRC on December 30, 1998 and supplemented by letter dated November 30, 1999 (References 1 and 2) and approved by the NRC on March 27, 2000 (Reference 3).

7.0 Confirmation for Renewed Applicability

Based on the information provided in the previous 10 CFR 50.55a request (References 1 and 2), information contained with the NRC approval documents (Reference 3) and the information provided above, the circumstances and basis continue to be applicable to this proposed relief request IST-3-R-1, Rev.1.

8.0 Duration of Re-Approved 10 CFR 50.55a Request

This request is for the duration of the 3rd 10-year program interval that shall commence on May 1, 2004 and terminate on August 17, 2013.

ENCLOSURE 2

Relief Request

IST-3-P-1, Revision 1

Full Scale Range Requirements of OM Code ISTB-3510 (a), (b)(1)

2nd 10-Year Pump Relief Request Number 12

Approved by NRC in 2nd 10-Year Interval

10 CFR 50.55a Request Number IST-3-P-1 Rev. 1

Information to Support NRC Re-Approval of a 10CFR 50.55a Request for Use During a New 10-Year Interval Inservice Testing Program

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1.0 Previous 10 CFR 50.55a Request Approved by NRC

Relief Request Number: Pump Relief Request Number 12

ASME Code Components Affected:

Saltwater Cooling Pumps (SWC):	P112, P113, P114 and P307
Reactor Charging Pumps:	P190, P191 and P192

References:

1. Letter, W. C. Marsh to USNRC, ASME Code Update for the Second Ten-Year Interval, Inservice Testing Program, August 17, 1993.

2. NRC Letter, dated August 31, 1994, Second 10-Year Interval for Inservice Testing of Pumps and Valves (Unit 2 - TAC No. M87283 and Unit 3 - TAC No. M87284).

2.0 Applicable Code and Addenda

ASME OM Code-1998 Code for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000.

3.0 Applicable Code Requirement

ISTB-3510 (b)(1) – the full-scale range of each analog instrument shall not be greater than three times the reference value, as it applies to ISTB-5221, ISTB-5321 and ISTB-5323.

4.0 Changes to the Applicable ASME Code

OM-6 of OM Code-1987, OMa-1988, OMb-1999 has been renumbered as ISTB of the OM Code 1998, OMa-1999, OMb-2000. OM-6, Section 4.6 Instrumentation defined the requirements of instrumentation used in Inservice Testing of pumps. ISTB-3500 Data Collection of the OM Code 1998, OMa-1999, OMb-2000 define the requirements of instrumentation used in the Inservice Testing of pumps.

In the 2nd 10-year interval, Southern California Edison, in Pump Relief Request Number 12, requested relief from the full scale range requirements for pressure and flow rates (Section 4.6.1.1 of OM-6) for SWC pump discharge pressure and Charging pump suction pressure and flow. This relief was granted on August 31, 1994 (Reference 2). The instrument full-scale range requirement of Code editions cited above did not change. Therefore, the changes to the applicable ASME OM Code have no effect on this request.

5.0 Component Aging Factors

Subsection ISTB of the OM Code does not address component aging. Instrument full-scale range and accuracy is independent of component aging factors as they are calibrated according to established standards regardless of component age.

6.0 Changes in Technology for testing the Affected ASME Code Components(s)

The required instrument full-scale range and accuracy requirement of the OM Code is not affected by any change in technology.

7.0 Proposed Alternative and Basis for Use

Alternate Testing: Use installed pressure and flow instrumentation as listed in Table 1 for Group A pump test for:

1. SWC Pumps (Group A)
2. Charging Pumps (Group A)

Note: Temporary pressure gauges that meet the range and accuracy requirements of the Code shall be used for Comprehensive Pump Testing.

Use installed flow instrumentation as listed in Table 1 for Comprehensive pump test for:

1. Charging Pumps (Comprehensive)

Basis for Relief: Relief is requested from the full scale range requirements of ISTB-3510 (b)(1) for SWC pump discharge pressure when implementing Group A Test Procedure for Vertical Line Shaft Centrifugal Pumps – ISTB-5221; Charging pump suction pressure and flow when implementing Group A Test Procedure for Positive Displacement Pumps – ISTB-5321, and Charging pump flow when implementing Comprehensive Test Procedure – ISTB-5323.

The instruments listed in Table 1 do not meet the ISTB-3510 (b)(1) requirement (i.e., the full-scale range of each instrument shall not be greater than three times the reference value). However, the manufacturer's stated accuracy for each pressure instrument listed in Table 1 exceeds the Group A accuracy requirements. Similarly, although the charging pump flow instrument, FI-0212's range is approximately 3.5 times the reference value, the gauge's accuracy of 1% exceeds the ISTB required accuracy of 2% for Group A and Comprehensive pump tests.

Even though the existing installed station instruments do not meet the code range requirement, their accuracy is better than the code requirements. Thus, the combination of range and accuracy of the installed instrument yields a reading that is better than the reading achieved from instruments that meet the minimum Code requirement.

Table 1

Pump	Parameter	Instrument	Instrument Range (Range/Ref Value)	Reference Value[1]	Maximum Inaccuracy Permitted by Code[2]	As Installed Accuracy at full Scale (error at full scale)
Saltwater Cooling System Pumps						
P112	Disch. Press.	PI-6230	0 – 160 (5.0)	32.4 psig	1.94 psig	0.5% (0.8 psig)
P113	Disch. Press.	PI-6231	0 – 160 (5.2)	31 psig	1.86 psig	0.5% (0.8 psig)
P114	Disch. Press.	PI-6233	0 – 160 (5.9)	27 psig	1.62 psig	0.5% (0.8 psig)
P307	Disch. Press.	PI-6232	0 – 160 (5.5)	29 psig	1.74 psig	0.5% (0.8 psig)
Reactor Charging Pumps						
P190	Suction Press.	PI-9284	0 – 160 (3.5)	46.0 psig	2.76 psig	0.625% (1.0 psig)
P191	Suction Press.	PI-9285	0 – 160 (3.6)	44.0 psig	2.64 psig	0.625% (1.0 psig)
P192	Suction Press.	PI-9286	0 – 160 (3.2)	50.0 psig	3 psig	0.625% (1.0 psig)
P190, P191 and P192	Flow	FI-0212	0 – 150 (3.3)	44.9 gpm	2.69 gpm	1.00% (1.50 gpm)
			0 – 150 (3.4)	44 gpm	2.64 gpm	1.00% (1.50 gpm)
			0 – 150 (3.3)	45 gpm	2.7 gpm	1.00% (1.50 gpm)

[1] Reference values are based on historical data for like pumps. Future values may be lower, but overall Code accuracy requirements would be met or exceeded under all conditions under which an IST would be performed.

[2] The information in this column represents the gauge error permitted by the code (3 times reference value X code required accuracy of 2% for Group A and B testing and for flow only during Comprehensive Pump Testing).

8.0 Confirmation of Renewed Applicability

Based on the information provided in the previous 10 CFR 50.55a request (Reference 1), information contained with the NRC approval documents (Reference 2) and the information provided above, the circumstances and basis continue to be applicable to this proposed relief request IST-3-P-1, Rev. 1.

9.0 Duration of Re-Approved 10 CFR 50.55a Request

This request is for the duration of the 3rd 10-year program interval that shall commence on May 1, 2004 and terminate on August 17, 2013.

ENCLOSURE 3

Relief Request

IST-3-P-2, Revision 1

Full Scale Range Requirements of OM Code ISTB-3510 (a), (b)(1)

2nd 10-Year Pump Relief Request Number 13

Approved by NRC in 2nd 10-Year Interval

Information to Support NRC Re-Approval of a 10CFR 50.55a Request for Use During a New 10-Year Interval Inservice Testing Program

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1.0 Previous 10 CFR 50.55a Request Approved by NRC

Relief Request Number: Pump Relief Request Number 13

ASME Code Components Affected:

ECW Pumps:	P160 and P162
CCW Seismic Make-up Pumps:	P1018 and P1019
DGFO Transfer Pumps:	P093, P094, P095, P096
CSS Pumps:	P012 and P013
LPSI Pumps:	P015 and P016

References:

1. Letter, W. C. Marsh to USNRC, Inservice Testing Program, Pump Relief Requests Nos. 13 and 14, November 22, 1994.

2. NRC letter, dated April 19, 1995, Inservice Testing (IST) Relief PRR-13 and PRR-14 to the San Onofre Nuclear Generating Station Units 2 and 3 IST Program Plan (TAC Nos. M91087 and M91088).

2.0 Applicable Code and Addenda

ASME OM Code-1998 Code for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000.

3.0 Applicable Code Requirement

ISTB-3510 (b)(1) – the full-scale range of each analog instrument shall not be greater than three times the reference value, as it applies to ISTB-5121, ISTB-5122, ISTB-5123, and ISTB-5221.

4.0 Changes to the Applicable ASME Code

OM-6 of OM Code-1987, OMa-1988, OMb-1999 has been renumbered as ISTB of the OM Code 1998, OMa-1999, OMb-2000. OM-6, Section 4.6 Instrumentation defined the requirements of instrumentation used in Inservice Testing of pumps. ISTB-3500 Data Collection of the OM Code 1998, OMa-1999, OMb-2000 defines the requirements of instrumentation used in the Inservice Testing of pumps.

In the 2nd 10-year interval, Southern California Edison, in Pump Relief Request Number 13, requested relief from OM-6, Section 4.6.1.2(a) that required the full-scale range of each analog instrument shall not be greater than three times the reference value. This relief was granted on April 19, 1995 (Reference 2). The required instrument full scale range requirement of the Code edition cited above did not change for Group A, B, or Comprehensive Pump Tests. Therefore, the changes to the applicable ASME OM Code have no effect on this request.

5.0 Component Aging Factors

Subsection ISTB of the OM Code does not address component aging. Instrument full-scale range and accuracy is independent of component aging factors as they are calibrated according to established standards regardless of component age.

6.0 Changes in Technology for testing the Affected ASME Code Components(s)

The required instrument full-scale range and accuracy requirement of the OM Code is not affected by any change in technology.

7.0 Proposed Alternative and Basis for Use

(A) Alternate Testing: Use installed instrumentation as listed in Table 1 for Group A and B pump testing for:

1. Emergency Chilled Water Pumps (Group B)
2. Component Cooling Water Seismic Make-up Pumps (Group B)
3. Diesel Generator Fuel Oil Transfer Pumps (Group A)

Note: Temporary pressure gauges that meet the range and accuracy requirements of the Code shall be used for Comprehensive Pump Testing.

Basis for Relief: Relief is requested from the full scale range requirements of ISTB-3510 (b)(1) for the ECW Pumps' suction pressure gauges, the CCW Seismic Make-up Pumps' suction pressure gauges, and the Diesel Generator Fuel Oil (DGFO) Transfer Pumps' discharge pressure gauges. The instruments listed in Table 1 do not meet the ISTB-3510 (b)(1) requirement (i.e., the full-scale range of each instrument shall not be greater than three times the reference value). As seen in Table 1, the ratios of Instrument Range to Reference Value (Range/Ref. Value) vary from 3.3 to 6.2. However, the manufacturer's stated accuracy for each pressure instrument listed in Table 1 exceeds the Group A and Group B accuracy requirements as stated in Table ISTB-3500-1. Thus, the combination of range and accuracy of the installed instrumentation yields a reading that is better than the reading achieved from instruments that meet the minimum Code requirements.

Table 1

Pump	Parameter	Instrument	Reference Value[1]	Instr. Range (Range/Ref Value)	Error Permitted by Code[2]	As Installed Accuracy at Full Scale (error at full scale)
Emergency Chilled Water Pumps						
P160 P162	Suction Pressure	PI-9883B PI-9883A	27 psig	0-160 (5.9)	1.62 psig	0.5% (0.8 psig)
Component Cooling Water Seismic Make-up Pumps (Group B)						
P1018 P1019	Suction Pressure	PI-6566 PI-6565	9.0 psig	0-30 (3.3)	0.54 psig	0.5% (0.15 psig)
Diesel Generator Fuel Oil Transfer Pumps						
P093 P094 P095 P096	Discharge Pressure	PI-5973 PI-5975 PI-5976 PI-5974	9.7 psig	0-60 (6.2)	0.58 psig	0.5% (0.3 psig)

(1) Reference values are based on historical data for like pumps. Future values may be lower, but overall Code accuracy requirements would be met or exceeded under all conditions under which an IST would be performed.

(2) The information in this column represents the gauge error permitted by the Code (3 times reference value X Code required accuracy of 2%, for Group A or B Testing).

(B) Alternate Testing: Use installed instrumentation as listed in Table 2 for Group A, B and Comprehensive pump testing for:

1. Containment Spray System Pumps (CSS) (Group B and Comprehensive)
2. Low Pressure Safety Injection (LPSI) Pumps (Group A and Comprehensive)

Basis for Relief: Relief is requested from the full scale range requirements of ISTB-3510 (b)(1) under certain scenarios for CSS pump suction pressures and LPSI pump suction and discharge pressures. For quarterly Group A and B tests, which are performed on miniflow, these gauges meet the Code required limits. However, during refueling outages, the water from the Refueling Water Storage Tanks (RWSTs), which provides suction head to the pumps, is transferred to the refueling canal. This lowers the water level in the RWSTs and thus the reference suction pressure for the Inservice Tests (ISTs). In these circumstances of reduced suction pressure, the gauges do not always meet the ISTB-3510 (b)(1) requirements (i.e., they read less than one-third of full scale, See Table 2).

The reference discharge pressure readings for the LPSI pumps are greater than one-third of the instrument range during the Group A miniflow tests conducted quarterly. Comprehensive Pump Tests are conducted biennially in accordance with Table ISTB-3400-1. During these Comprehensive Pump Tests, due to the lower RWST level and the change in system line-up, the reference discharge pressure drops below one-third of full scale of the installed instrumentation. As a consequence, the limits of ISTB-3510 (b)(1) are not met during the Comprehensive Pump Tests.

The manufacturer's stated accuracy for each pressure instrument listed in Table 2 exceeds the required accuracy in Table ISTB-3500-1 (+/- 2% for Group A and B Tests and +/- 0.5% for Comprehensive Tests).

Even though the existing installed station instruments do not meet the Code range requirements of ISTB-3510 (b)(1), their overall accuracy exceeds the Code requirements. Thus, the combination of range and accuracy of the installed instrumentation yields a reading that is better than the reading achieved from instruments that meet the minimum Code requirements. The reference values listed in the Tables are based on historical data, and although future values may be lower than the values listed, the overall Code accuracy requirements would be met or exceeded under all conditions under which an IST would be performed.

Table 2

Pump	Parameter	Instrument	Nominal Quarterly Reference[1]	Worst Case Refueling Reference[2]	Instr. Range (Range/Ref. Value)	Error Permitted by Code[3]	As Installed Accuracy at Full Scale (error at full scale)
Containment Spray System Pumps							
P012 P013	Suction Pressure	PI-9087 PI-9085	30 psig	19.7 psig	0-75 (3.8)	0.295 psig	0.25% (0.19 psig)
LPSI Pumps							
P015 P016	Suction Pressure	PI-9081 PI-9083	31 psig	13 psig	0-60 (4.6)	0.195 psig	0.25% (0.15 psig)
P015 P016	Disch Pressure	PI-9082 PI-9084	215 psig	149 psig	0-500 (3.4)	2.235 psig	0.25% (1.25 psig)

(1) Reference values are based on historical data for like pumps. Future values may be lower, but overall Code accuracy requirements would be met or exceeded under all conditions under which an IST would be performed.

(2) For the worst case refueling reference, the gauges read below the Code required range (i.e. less than 1/3 of full scale)

(3) The information in this column represents the gauge error permitted by the Code (3 times reference worst case refueling value X Code required accuracy of 0.5%, during Comprehensive Testing).

8.0 Confirmation of Renewed Applicability

Based on the information provided in the previous 10 CFR 50.55a request (Reference 1), information contained with the NRC approval documents (Reference 2) and the information provided above, the circumstances and basis continue to be applicable to this proposed relief request IST-3-P-2 Rev. 1.

9.0 Duration of Re-Approved 10 CFR 50.55a Request

This request is for the duration of the 3rd 10-year program interval that shall commence on May 1, 2004 and terminate on August 17, 2013.

ENCLOSURE 4

Relief Request

IST-3-P-3, Revision 1

Flow Measure Requirements of OM Code ISTB-5121 (b), (c)

New

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship or Unusual Difficulty without Compensating Increase in Level of Quality and Safety

1.0 ASME Code Component(s) Affected

Components: Auxiliary Feedwater Pumps:

S21305MP140, S31305MP140
S21305MP141, S31305MP141
S21305MP504, S31305MP504

Class: 3

Quantity: Unit 2: 3 pumps
Unit 3: 3 pumps

2.0 Applicable Code Edition and Addenda

ASME OM Code-1998 Code for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000.

3.0 Applicable Code Requirement

ISTB-5121 (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-5121(c): Where system resistance cannot be varied, flow rate and pressure shall be determined and compared to their respective reference values.

4.0 Reason for Request

Relief is requested from the requirement to measure pump flow during the performance of Group A testing of Auxiliary Feedwater (AFW) pumps. Group A testing of these pumps is performed using minimum flow recirculation lines not equipped with instrumentation to provide the measurement of pump flow as required by the Code. The pump minimum flow recirculation line must be used when these pumps are tested on a quarterly interval during power operation because this is the only flow path available that does not challenge the normal operation of the Unit. Minimum flow lines are not designed for pump testing purposes.

Each Unit has 3 AFW pumps. It is estimated to cost more than $90,000 annually to install temporary flow measurement devices to support quarterly Group A testing for the pumps on both Units. Installation of six permanent flow devices for both Units on the Auxiliary Feedwater miniflow lines is estimated to cost more than $400,000. Therefore, the requirement to install temporary or permanent instrumentation to meet the Code requirements imposes an undue burden for the information that would be gained.

5.0 Proposed Alternative and Basis for Use

Proposed Alternative: Group A quarterly testing of the AFW pumps will be performed on mini-flow recirculation measuring the differential pressure across the pump in lieu of measuring flow.

Note: Pump flow rate will be measured during performance of biennial Comprehensive pump test when an instrumented flow path is available.

Basis for Use: The AFW pumps, each have a non-instrumented minimum-flow path that can be utilized for the respective Group A tests. The minimum flow lines used for these pumps provide a fixed resistance flow path from the pump discharge to the Condensate Storage Tank (T-121) and then back to the suction of each pump. During the performance of the quarterly Group A pump testing, pump differential pressure and vibration parameters are measured and trended. This provides a reference value for differential pressure that can be duplicated during subsequent tests in accordance with OM-ISTB-3300 (d).

The performance of Group A pump tests using a fixed resistance flow path is an acceptable alternative to the Code requirements as per NUREG -1482, NRC Staff Position 9, 'Pump Testing Using Minimum-Flow Return Line With Or Without Flow Measuring Devices.' This methodology provides for the acquisition of repeatable differential pressure and vibration measurement, which is an adequate means of monitoring pump degradation.

Therefore, the cost of installing either temporary or permanent flow instrumentation imposes an undue burden without a compensating increase in the level of quality and safety.

6.0 Duration of Approved 10 CFR 50.55a Request

This request is for the duration of the 3rd 10-year program interval that shall commence on May 1, 2004 and terminate on August 17, 2013.

7.0 References

NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, November 1993.

ENCLOSURE 5

Relief Request

IST-3-V-1, Revision 1

Reactor Coolant System WKM Valves

2nd 10-Year Valve Relief Request Number 1

Approved by NRC in 2nd 10-Year Interval

Information to Support NRC Re-Approval of a 10CFR 50.55a Request for Use During a New 10-Year Interval Inservice Testing Program

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety

1.0 Previous 10 CFR 50.55a Request Approved by NRC

Relief Request Number: Valve Relief Request Number 1

ASME Code Components Affected:

Internal spring-loaded poppet valves (check valves) in the upstream (high-pressure) segment of the Shutdown Cooling System (SDC) gate valves listed in Table 1 below[1,2].

Table 1 WKM Gate Valves

Valve ID	Size (inches)	Description	Poppet Valve Removed
2HV9337	16	SDC suction containment isolation valve	No
3HV9337	16	SDC suction containment isolation valve	No
2HV9339	16	SDC suction containment isolation valve	No
3HV9339	16	SDC suction containment isolation valve	No
2HV9377	8	SDC suction containment isolation valve	No
3HV9377	8	SDC suction containment isolation valve	Yes
2HV9378	8	SDC suction containment isolation valve	No
3HV9378	8	SDC suction containment isolation valve	Yes

[1]This request is written in reference to the major equipment identification number because the spring-loaded poppet valves are internal sub-components of the main valve and do not have a specific identification number assigned.

[2]*Plant configuration at time of Relief Request Submittal.*

References:

1. Letter from A. E. Scherer of SCE to U. S. Nuclear Regulatory Commission dated January 28, 2000; Docket Nos. 50-361 and 50-362 Request for Proposed Alternative Testing for Check Valves which are Internally Mounted in Motor Operated Valves, in Accordance with 10 CFR 50.55a(a)(3) San Onofre Nuclear Generating Station, Units 2 and 3 (TAC Nos. M93515 and M93516).

2. Letter from Walter C. Marsh of SCE to U. S. Nuclear Regulatory Commission dated February 13, 1996; Subject: Docket Nos. 50-361 and 50-262.Response to Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves".

3. Maintenance Procedure SO123-I-6.75, Revision 4, "WKM Model D-2 Gate Valve Overhaul."

4. SCE Document No. SO23-507-5-1-207, Rev. 4, "Pressure Test of POW-R-SEAL Gate Valves." This is WKM Engineering Standard, Classification Number 36-0105.

5. SCE Document No. SO23-3-2.6, Revision 19, "Shutdown Cooling System Operation."

6. Letter from J. L. Rainsberry (SCE) to Document Control Desk (NRC) dated July 21, 1999; Subject: Response to Request for Additional Information Regarding Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves."

7. Drawing No. SO23-507-5-1-366, "Pressure Relief Valve 250 ±50 psid"

8. Drawing No. SO23-507-5-1-139 Rev. 6, "10 x 8 x 10 Class 1500, Model D-2 OPG POW-R-SEAL".

9. Letter from Stephen Dembek (NRC) to H.B Ray (SCE), Inservice Testing (IST) Program - Relief Request For Alternative Testing For Certain Check Valves, March 16, 2000.

2.0 Changes to the Applicable ASME Code Section

OM-10 of OM Code-1987, OMa-1988, OMb-1989 has been renumbered as ISTC of the OM Code-1998, OMa-1999, OMb-2000. Sections 4.2, 4.2.2 and 4.3 of OM-10 have been renumbered as ISTC-3510, ISTC-3610 and ISTC-3522 in subsection ISTC of OM Code-1998, OMa-1999 and OMb-2000, respectively.

In the 2nd 10-year interval, SCE in Valve Relief Request Number 1, requested relief for alternative testing for the internal poppet valves listed in Table 1. This relief was granted on March 16, 2000 (Reference 9). The changes in the above referenced OM code sections have no effect on this request.

3.0 Applicable Code and Addenda

ASME OM-Code-1998 Code for Operation and Maintenance of Nuclear Power Plants, ASME OMa Code-1999 and ASME OMb Code-2000.

4.0 Applicable Code Requirement

ISTC-3510 – Exercising Test Frequency, and ISTC-3522 – Category C Check Valves.

5.0 Component Aging Factors

Component aging factors do not have an effect on the poppet valves, as these valves are mechanically simple and extremely reliable. Poppet valve performance history shows there were no failures or degradations noted in the sixteen safety related and non-safety related valves that have been inspected. The most probable failure mode for the poppet valve is open, which satisfies the function of the valve.

6.0 Changes in Technology for Testing the Affected ASME Code Components(s)

The poppet valves are not affected by any change in technology for testing because credit is taken for the satisfactory operation of the MOV and not on the individual poppet valve test.

7.0 Background

7.1 Function

These motor operated gate valves are manufactured by WKM. They are gate and segment style valves with Limitorque motor operators. These motor operated valves (MOVs) form the isolation boundary (Figure 1) for the Reactor Coolant System (RCS) to SDC piping. They are closed with a key switch lock during normal operation and are opened for shutdown cooling operation. The valves have both an RCS pressure isolation and containment isolation function. They are exempt from Appendix J requirements since a portion of the line inside containment remains pressurized when the RCS is pressurized.

Updated Final Safety Analysis Report Table 6.2-35 for penetration 9 exempts 2(3) HV9337 and 2(3) HV9377 from Type C testing. Seat leakage testing is required per Technical Specification 3.4.14 for all four valves. Position indication is Quality Class II, Class 1E qualified, and required to indicate valve position. Certain outside containment line break scenarios require closing these valves. Small break loss of coolant events may require opening them should the shutdown cooling system need to be used. The upstream (high pressure side) segment of each valve contains a vendor supplied spring-loaded poppet (check valve) designed to open at a differential pressure of 250±50 psid to relieve the internal pressure between the gate and segment to minimize the potential for pressure locking. The poppet valves have no rated capacity and do not have an adjustable set point. As such, they are classified as spring-loaded check valves. The motor operated valves are the first and second valves off of the reactor coolant system. There are no upstream isolation valves to facilitate pressure boundary work on the subject valves without de-fueling the reactor.

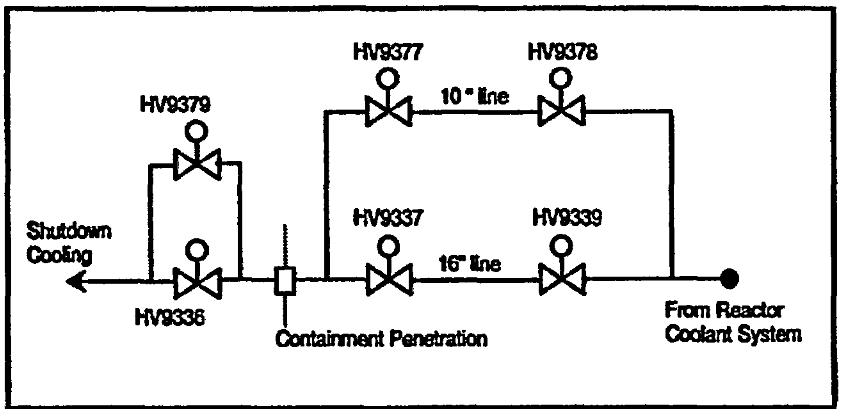


Figure 1 Simplified Valve Diagram

7.2 Discussion

The subject gate valves, manufactured by WKM, were identified in SCE's submittal of February 13, 1996 (Reference 2) as valves with potential functional impact due to pressure locking. This relief request pertains to the WKM valves currently considered as susceptible to pressure locking identified in Table 1.

The potential for pressure locking in these valves occurs because of leakage between the segment and the seat in the upstream valves, HV9339 and HV9378, which pressurizes the bonnet to the reactor coolant system (RCS) pressure of about 2,235 psia. The RCS pressure is reduced to below 400 psig prior to starting the SDC system. If internal bonnet pressure is not relieved, the high-pressure water trapped in the bonnet cavity causes the segment and the gate to press tightly against the seats. HV9377 and HV9337 may be, over time, subjected to the RCS pressure on the segment side similar to the upstream valves. For the SDC valves outside containment, 2(3) HV9336 and 2(3) HV9379, evaluation indicates that they are not susceptible to pressure locking. Therefore, they are no longer considered within the scope of Generic Letter (GL) 95-07 and are not considered in this relief request.

In view of the pressure-locking scenario described above, a valve may fail to open if a relief path from the bonnet cavity does not exist. The function of the internal poppet valves is to provide the relief path to reduce the potential for high bonnet pressure. This function is explained in detail below.

The subject valves are equipped with a spring-loaded poppet installed in the segment, which together with the gate make up the valve disc (see Drawing No. SO23-507-5-1-139 Rev. 6). Marotta Scientific Controls, Inc. of Boonton, N.J, manufactures these poppet relief devices. The function of the poppet valve is to limit the pressure buildup in the bonnet and between the gate and the segment to a specified value. This is achieved by providing a path between the bonnet and the upstream side of the valve. Limiting the pressure differential between the bonnet and the upstream side minimizes the potential for pressure locking. The poppet valves do not protect the code class boundary. They are neither capacity rated, nor set point adjustable; therefore, they are considered check valves.

Drawing No. SO23-507-5-1-139 Rev. 6 shows a cross sectional view of the 8 inch WKM valve, ID No. 2(3) HV9378. This valve drawing is representative of the other Model D-2 OPG POW-R-SEAL WKM valves listed in Table 1. The drawing shows the valve internal components, including the valve's split disc. This disc consists of the segment and the gate. The figure also shows the location of the spring-loaded poppet in the segment (Item 31).

The poppet valve is set to begin to open at a pressure of 250±50 psid (differential pressure) between the bonnet and the upstream side (the upstream side pressure plus 300 psi represents an upper bound on the bonnet differential pressure). The following is a brief description of the poppet valve and its main components:

- The valve is 3/4" long and about 0.362" in diameter. It is threaded to the segment at the location shown in Drawing No. SO23-507-5-1-139 Rev. 6. To eliminate assembly errors, the valve cannot be installed backwards.
- The valve internals include a stainless steel poppet, a retaining ring attached to the poppet, an inconel spring, and a stellite seat assembled as shown in Drawing No. SO23-507-5-1-366. The compression spring is 0.3" in diameter and is less than 0.5" long. It is securely enclosed between a recess in the seat and the retaining ring.
- The materials of the valve internals are highly corrosion resistant. Furthermore, the materials of the poppet and the seat (stainless steel on stellite) were selected such that binding will not occur under operating conditions. Binding could lead to the poppet being stuck in a closed position.
- The compression spring has a small height to diameter ratio. This feature ensures stability of the spring under a compressive load without the possibility of buckling.
- The valve has no guides and no stability components. It has only one moving part, the poppet assembly and the attached retaining ring.

The foregoing discussion emphasizes the valve's simplicity in design and construction. It also shows that the materials of construction were selected to provide resistance against corrosion and to eliminate the potential for binding between the poppet and the seat. The function of the valve is described briefly as follows:

- The spring is compressed during assembly between the seat and the retaining ring. The compression of the spring force is transmitted to the poppet via the retaining ring to seat it against the stellite seat to provide the desired sealing. The arrow indicating the flow direction in Drawing No. SO23-507-5-1-366 is on the bonnet side and the seat is on the upstream side.

- If the bonnet pressure is sufficient to overcome the force in the spring, lift-off will take place. Spring stiffness and the amount of pre-compression applied to the spring during assembly are calculated such that lift off occurs at the valve set point. The path created between the bonnet and the upstream side by this lift off allows some of the water trapped in the bonnet to escape to the upstream side, thus relieving the bonnet overpressure.

The poppet valve is manufactured to a very simple design, with only one moving part, the poppet, which is attached to the retaining ring (see Drawing No. SO23-507-5-1-366). The poppet can only move in the axial direction guided by the retaining ring at one end and the hole in the seat at the other end. The short length of the compression spring eliminates the potential for buckling. Also, the seat end of the spring is enclosed in a recess in the seat to prevent lateral motion. All these features ensure that the poppet is allowed to move only in the axial direction should high pressure exist in the bonnet, with practically no possibility of deviation from this simple motion. Accordingly, there is no possibility of the poppet being stuck in a cocked position. Even if the poppet became misaligned, tight seating would not be possible, which provides a relief path. The simplicity in the poppet valve design ensures a high level of reliability.

8.0 Proposed Alternative and Basis for Use

Alternate Testing: Diagnostic testing of the motor operated gate valves coupled with the normal operation during the course of the plant shutdown evolutions associated with placing the shutdown cooling (SDC) system in service provide adequate indication of the Moratta poppet valve performance. Satisfactory operation of the MOV and continued diagnostic testing satisfy periodic verification that pressure-locking scenarios are not affecting the valves' material condition. In addition, any maintenance activity requiring disassembly of the valve will include permanent removal of the poppet assembly to mitigate reliance on the poppet to minimize pressure-locking concerns (Reference 1).

Basis for Relief: The internal spring-loaded poppet valves are component sub-assemblies of the segment of the valve. Periodic diagnostic testing of the motor operated valves coupled with the normal valve operation during the course of plant shutdown evolutions associated with placing the SDC system in service provide adequate indication of poppet valve performance. While diagnostic testing and operation of the motor operated valve does not provide direct trending information for the poppet valve performance, it does provide objective evidence that pressure locking is not occurring. Successive periodic MOV diagnostic tests clearly indicate no evidence of damage to the gate, segment, or seating surfaces as a result of pressure locking, even though the valve bonnets are exposed to RCS pressure.

The poppet valve is a mechanically simple and extremely reliable component. Review of the poppet valve performance history reveals no failures or degradation noted in the sixteen safety related and non-safety related valves that have been inspected. The most probable failure mode for the poppet valve is open, which satisfies the function of the valve. The poppet valve, which is installed in the upstream segment, has no close function, as the down-stream gate is the rated seating member of the valve.

There are two viable methods of quantitative testing for the Marotta poppet valves.

1. The first method entails a major valve disassembly and removal of the poppet from the valve segment. Once removed, the poppet can then be tested and inspected. Disassembly of the valves in Table 1 can only be accomplished with the reactor defueled and the reactor coolant system (RCS) loops drained. Based on the recent overhaul of 3HV9377 in January 2003 per MO's 0101102001, 01030323000, 02091841000 and 02040318000, which included the complete disassembly of the valve, the replacement of the poppet valve with a fixed orifice plug, reassembly of the valve, followed by MOV diagnostic testing took over 750 man-hours to complete.

Given that there are four (4) valves per unit, SCE would have to defuel the reactor each refueling outage, drain the RCS loops and expend over 3,000 man-hours per refueling outage to disassemble the MOVs in order to test the poppet valves. The outage impact and the man-hours associated with testing the poppet valves at a refueling interval frequency represent a significant hardship without a compensating increase in level of quality or safety.

2. The second method involves removal of one body plug followed by the application of a pressure source to the valve body cavity. The attendant pressure profile generally characterizes poppet valve performance, although the results may be confused by seat leakage.

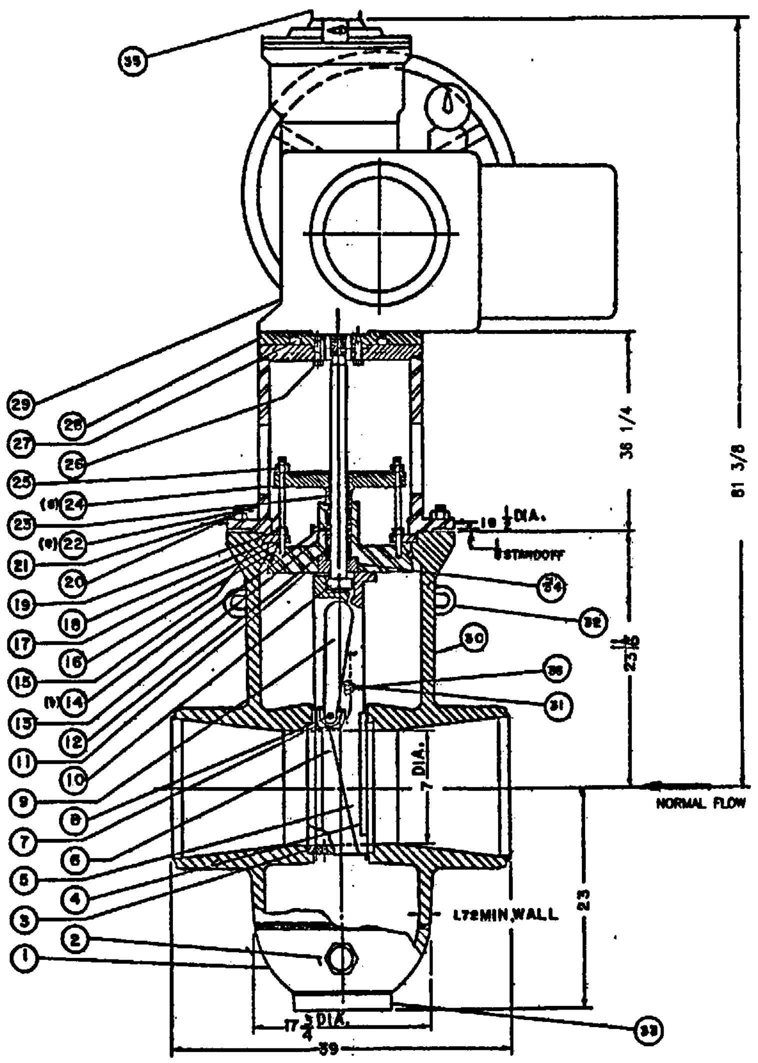
Both poppet test scenarios disable the shutdown cooling system and require breaching the reactor coolant system pressure boundary. Both scenarios require a de-fueled condition with the reactor coolant loops drained. The outage impact and the man-hours cost associated with testing the poppet valves at a refueling interval frequency represent a significant hardship without a compensating increase in level of quality or safety.

9.0 Confirmation of Renewed Applicability

Based on the information provided in the previous 10 CFR 50.55a request (Reference 1), information contained with the NRC approval documents (Reference 9) and the information provided above, the circumstances and basis continue to be applicable to this proposed relief request IST-3-V-1 Rev. 1.

10.0 Duration of Re-Approved 10 CFR 50.55a Request

This request is for the duration of the 3rd 10-year program interval that shall commence on May 1, 2004 and terminate on August 17, 2013.



	NO	DESCRIPTION	MATERIAL	QTY
(h)	1	BODY LOWER SECTION	ASME SA-182 GR. F316	1
(h)	2	BODY PLUG	ASME SA-479-GR 316	1
(g)(a)(d)	3	SEATS	ASTM 1-182-GR F 316L W/OL	2
(a)(g)	4	SEAT SKIRTS	ASTM A-693 GR. 630 W/CHROME PLATE	2
(h)(a)(d)	5	SEGMENT	ASME SA-487-GR CA6NM W/OL	1
(h)(a)(d)	6	GATE	ASME SA-487-GR CA6NM W/OL	1
(g)(d)(a)	7	LEVER LOCK ARM SHOE	ASTM A-693-GR 630 W/OL	2
(g)(a)	8	SHOE PIN	ASTM A-564-GR 630	2
(g)(a)	9	LEVER LOCK ARM ASSEMBLY	FABRICATED 17-4 PH	1
(g)	10	STEM	ASTM A-564-GR 630	1
(h)	11	BONNET FABRICATED	ASME SA-182 GR. F316 ASME SA-240 GR. 316	1
(j)(a)(c)	12	PACKING SET	CHESTERTON	1
(c)(j)	13	LANTERN RING	ASTM A-564 GR. 630	1
(c)(j)	14	1/2" NPT PACKING LEAK OFF PLUG	ASTM A-182 GR. F316	1
(c)(j)	15	FOLLOW PLATE STUD	ASME/ASTM (S) A-453 GR. 660, 7/8"-9NC	2
(j)(a)	16	SEAL RING	ASTM A-182 GR. F316	1
(j)	17	BONNET STUD	ASME/ASTM (S) A-453 GR. 660, 7/8"-9NC	6
(j)	18	LIFTING RING	ASME/ASTM (S) A-564 GR. 630	1
(j)	19	BONNET NUT	ASME/ASTM (S) A-453 GR. 660, 7/8"-9NC	8
(g)	20	YOKE NUT	ASTM A-194 GR. 2H 1-8N	12
(g)	21	YOKE STUD	ASTM A-193-GR B7 1-8N	12
(k)(g)(f)	22	YOKE	FABRICATED CARBON STEEL	1
(j)	23	PACKING GLAND	ASTM A-564 GR. 630	1
(j)(f)	24	FOLLOW PLATE	ASME/ASTM (S) A-564 GR. 630	1
(j)	25	FOLLOW PLATE NUT	ASME/ASTM (S) A-453 GR. 660, 7/8"-9NC	2
(g)	26	MOUNTING PLATE BOLT	ASTM A-193-GR B7 5/8-11NC	8
(g)	27	MOTOR MOUNTING BOLT	ASTM A-193-GR B7 5/8-11NC	8
(g)	28	MOTOR MOUNTING PLATE	ASTM A-283-GR D	1
(g)	29	MOTOR ACTUATOR	SB-1-15-900 MOTOR SHAFT TO PINION GEAR KEY SHALL BE TYPE 4140 STEEL	1
(h)	30	BODY	ASME SA351 GR CF8M	1
(j)	31	THERMO RELIEF VALVE	ASME AS-479 TYPE 316	1
(j)	32	LIFT EYES	ASME SA-240 TYPE 316	2
(j)	33	SUPPORT RING	ASME SA-240 TYPE 316	1
(j)	34	PACKING BUSHING	ASTM B-150 ALLOY NO. 630	1
(j)	35	STEM PROTECTOR	ASTM A-105 OR CAST IRON	1
(j)	36	ADAPTER	ASME SA-479 GR. 316	1

REF: 2HV 9378
3HV 9378

NOTES:

(a) RECOMMEND ONE SPARE SET.
(b) PACKING LEAK-OFF IS TO BE ON DOWN STREAM SIDE OF VALVE AS SHOWN.
(c) REFER TO DRAWING M-40658 FOR PACKING SET DETAILS.
(d) HARD SURFACE MATERIAL TO BE IN ACCORDANCE WITH AWS A5.13-70, CLASSIFICATION R-COCr-A.
(e) VALVE OPERATOR WILL BE REMOVED & REINSTALLED ON VALVE IN THE FIELD IN ORDER TO PUT VALVE THROUGH AVAILABLE SLEEVE.
(f) YOKE & FOLLOW PLATE SHOWN 90° OUT OF PLANE.
(g) NON-PRESSURE RETAINING PART ESSENTIAL TO FUNCTION.
(h) ASME SEC. III PRESSURE RETAINING PART.
(i) FOR ACTUATOR ORIENTATION SEE NOTE (1), PG. 2 OF 3.
(j) NON-PRESSURE RETAINING PART NON-ESSENTIAL TO FUNCTION.
(k) PAINT YOKE WITH VALSPAR 76-W-900.

SOUTHERN CALIFORNIA EDISON

DRAWING NUMBER	DESCRIPTION
RS249693	ACF INDUSTRIES

REFERENCES

NO.	DESCRIPTION	DATE	MADE	CHK'D	RE	IRE	FLS	OTHER
6	REDRAWN IN AUTOCAD INCORPORATE DCN'S 3, 4, & 5	08/27/02	JAH	RMB				

REVISIONS

QC I UNIT 2 & 3

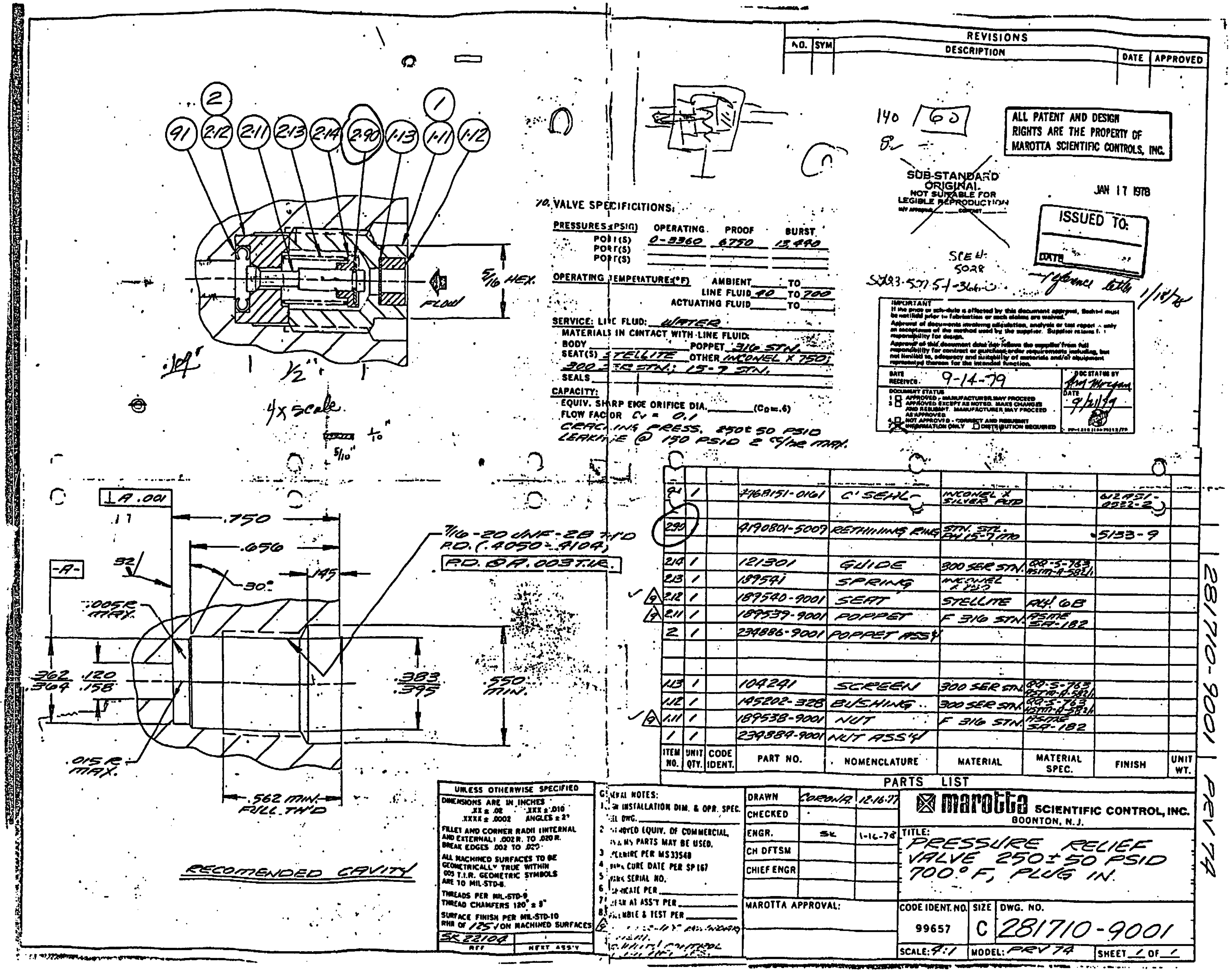
SAN ONOFRE NUCLEAR GENERATING STATION

10 x 8 x 10 CLASS 1500
MODEL D-2 OPG POW-R-SEAL

SCE SOUTHERN CALIFORNIA EDISON

S023-507-5-1-139 REV. 6

Site File Copy


REVISIONS
NO. SYM DESCRIPTION DATE APPROVED
ALL PATENT AND DESIGN RIGHTS ARE THE PROPERTY OF MAROTTA SCIENTIFIC CONTROLS, INC.
SUB-STANDARD ORIGINAL. NOT SUITABLE FOR LEGIBLE REPRODUCTION
JAN 17 1978
ISSUED TO:
VALVE SPECIFICATIONS:
PRESSURES (PSIG) OPERATING PROOF BURST
0-3360 6750 13,440
OPERATING TEMPERATURE (°F) AMBIENT ___ TO ___
LINE FLUID 40 TO 700
ACTUATING FLUID ___ TO ___
SERVICE: LINE FLUID: WATER
MATERIALS IN CONTACT WITH LINE FLUID:
BODY ___ POPPET 316 STN.
SEAT(S) STELLITE OTHER INCONEL X 750; 300 SER STN.; 15-7 STN.
SEALS
CAPACITY:
EQUIV. SHARP EDGE ORIFICE DIA. ___ (Cd=.6)
FLOW FACTOR Cv = 0.1
CRACKING PRESS. 250 ± 50 PSIG
LEAKAGE @ 190 PSIG 2 cc/hr MAX.
5/16 HEX.
FLOW
4x scale
RECOMENDED CAVITY
7/16-20 UNF-2B THD P.D. (.4050-.4104)
P.D. ⊚ A .003 T.I.R.
.750
.656
.562 MIN. FULL THD
.550 MIN.
.383 .395
.362 .364
.120 .158
.005 R MAX.
.015 R MAX.
30°
45°
DATE RECEIVED 9-14-79
ITEM NO. | UNIT QTY. | CODE IDENT. | PART NO. | NOMENCLATURE | MATERIAL | MATERIAL SPEC. | FINISH | UNIT WT.
91 | 1 | | 4468151-0161 | C' SEAL | INCONEL X SILVER PLTD | | |
290 | | | 4190801-5009 | RETAINING RING | STN. STL. PH 15-7 MO | | 5133-9 |
214 | 1 | | 121301 | GUIDE | 300 SER STN. | | |
213 | 1 | | 189541 | SPRING | INCONEL X 750 | | |
212 | 1 | | 189540-9001 | SEAT | STELLITE | ALL 6B | |
211 | 1 | | 189539-9001 | POPPET | F 316 STN. | ASME SA-182 | |
2 | 1 | | 234886-9001 | POPPET ASS'Y | | | |
113 | 1 | | 104241 | SCREEN | 300 SER STN. | QQ-S-763 | |
112 | 1 | | 145202-328 | BUSHING | 300 SER STN. | QQ-S-763 | |
111 | 1 | | 189538-9001 | NUT | F 316 STN. | ASME SA-182 | |
1 | 1 | | 234884-9001 | NUT ASS'Y | | | |
PARTS LIST
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES .XX ± .02 .XXX ± .010 .XXXX ± .0002 ANGLES ± 2°
FILLET AND CORNER RADII INTERNAL AND EXTERNAL .002 R. TO .020 R.
BREAK EDGES .002 TO .020
ALL MACHINED SURFACES TO BE GEOMETRICALLY TRUE WITHIN .005 T.I.R.
THREADS PER MIL-STD-9
THREAD CHAMFERS 120° ± 5°
SURFACE FINISH PER MIL-STD-10 RHR OF 125 ON MACHINED SURFACES
GENERAL NOTES:
DRAWN CORONA 12-16-77
CHECKED
ENGR. SK 1-16-78
CH DFTSM
CHIEF ENGR
MAROTTA APPROVAL:
marotta SCIENTIFIC CONTROL, INC. BOONTON, N.J.
TITLE: PRESSURE RELIEF VALVE 250 ± 50 PSID 700° F, PLUG IN.
CODE IDENT. NO. 99657
SIZE C
DWG. NO. 281710-9001
SCALE: 4:1
MODEL: PRV 74
SHEET 1 OF 1
281710-9001 PRV 74