TECHNICAL EVALUATION REPORT

Pump and Valve Inservice Testing Program
Palisades Nuclear Plant
Consumers Power

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ABSTRACT

This report presents the results of Brookhaven National Laboratory's evaluation of the Palisades Nuclear Plant Pump and Valve Inservice Testing Program relief requests.

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1.0 INTRODUCTION

Contained herein is a technical evaluation of the ASME Section XI pump and valve inservice testing (IST) program relief requests submitted by Consumers Power for its Palisades Nuclear Plant. Palisades is a Combustion Engineering Pressurized Water Reactor (PWR) that began commercial operation in 1973.

Consumers Power submitted revision 14 of "Inservice Testing of Plant Valves" and revision 15 of the "Inservice Testing of Selected Safety-Related Pumps" procedures by a letter dated June 28, 1991. This program addresses the second interval which began in 1983, and complies with the 1983 edition of the ASME Section XI Code with the Summer 1983 Addenda. This program supersedes the valve testing program submitted March 13, 1991, and the pump testing program submitted February 28, 1990. Any IST program revisions other than those noted above are not addressed in this Technical Evaluation Report (TER).

The Code of Federal Regulations 10CFR50.55a(g) requires that inservice testing of ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where specific relief has been requested by the licensee and granted by the commission pursuant to 10CFR50.55a(a)(3)(i), (a)(3)(ii), or (g)(6)(i).

Consumers Power has requested relief from certain ASME Section XI testing requirements in their IST program. A number of the relief requests have been approved by Generic Letter 89-04 and are so noted in the TER summary table. The requests that have not been approved by the Generic Letter have been evaluated herein to determine if the criteria in 10CFR50.55a for granting relief have been met. This review was performed utilizing the Standard Review Plan, Section 3.9.6; Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," and the minutes of the Public Meeting on Generic Letter 89-04, dated October 25, 1989. The IST Program requirements apply only to component testing (i.e., pumps and valves) and are not intended to provide a basis to change the licensee's current Technical Specifications for system test requirements.

Section 2 of this report presents the two Palisades Nuclear Plant relief requests not previously approved by Generic Letter 89-04 and Brookhaven National Laboratory's (BNL) evaluations and conclusions regarding these requests for the pump testing program. Similar information is presented in Section 3 for the valve testing program relief requests. A review of the twenty-eight valve cold shutdown justifications was performed and details of this review are contained in Section 4.

Other inconsistencies and omissions in the licensee's IST program noted during the course of the cold shutdown justification reviews and relief request evaluations are presented in Section 5. Additionally, any actions required of the licensee in the relief request evaluations are presented in Section 5. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

2.0 PUMP IST PROGRAM RELIEF REQUESTS

In accordance with 10CFR50.55a, Consumers Power has submitted relief requests for specific pumps at the Palisades Nuclear Plant that are subject to inservice testing under the requirements of ASME Section XI. These relief requests have been reviewed to verify their technical basis and determine their acceptability. Each relief request is summarized below, along with the technical evaluation by the BNL reviewer.

2.1 LPSI and Containment Spray Pumps, Pump Relief Requests 2 and 3

2.1.1 *Relief Request:* The licensee has requested relief from measuring and recording the low pressure safety injection system (LPSI) Pumps, P67A and B, and Containment Spray Pumps, P54A, B, and C, bearing temperature in accordance with ASME Section XI, paragraph IWP-3100.

2.1.2 *Proposed Alternate Testing:* The licensee has proposed analyzing oil samples from the crank case and bearing signature on a periodic basis, in addition to the Code required lubricant level monitoring.

2.1.3 *Licensee's Basis for Relief:* The licensee states: "Test flow rates for the LPSI (and Containment Spray) pumps are in the range of 188-192 gpm (and 255-265 gpm, respectively). This equals approximately 6.3 percent of the LPSI design flow (and 20 percent of the Containment Spray design flow). Per letter from Ingersoll-Rand to Consumers Power Company dated 6/22/87, the following conclusions are made:

1. "The original recommended minimum flow of 163 gpm (for the LPSI pumps and 167 gpm for the Containment Spray pumps) was based entirely on thermal criteria. This criteria established a flow value that would permit operation at low flows without heating the pumped fluid to a flash point. This criteria obviously resulted in mechanical problems (i.e., vibration related damage).

2. "To be assured of no mechanical problems, we would recommend increasing the minimum flow to 1140 gpm for any testing and extended periods of operation.

Observed vibration amplitudes are in the range of 1.5 to 4.0 mils (for the LPSI pumps and 0.5 to 2.0 mils for the Containment Spray pumps) per Palisades historical records.

Vibration is attributed to internal recirculation caused by low flow rates. These values fall in the excessive range (for the LPSI pumps and the tolerable to excessive range for the Containment Spray pumps) according to standard industry vibration charts. Since these units are only run at very low flow during inservice testing, damaging results can be avoided by minimizing the run time. Deletion of bearing temperature measurement requirement will reduce the run time by one hour for tests where this is a requirement. This relief request requires NRC approval before it can be implemented."

2.1.4 *Evaluation:* The industry recognizes that an increase in bearing temperature may be used as an indicator of bearing failure. However, in most cases the temperature does not increase measurably until failure is imminent. By this time, other indications of bearing failure would also be present, such as increased vibration or audible noise. Therefore, the data obtained from measuring bearing temperature once a year would be of little use, unless it happened to occur just prior to or during a catastrophic bearing failure. This is recognized in ASME/ANSI OMa-1988, Part 6, Inservice Testing of Pumps in Light Water Reactor Plants, which eliminates the requirement for measuring bearing temperature. Measurement of pump vibration also provides a means of monitoring bearing wear. By recording and trending this information, a more effective method of detecting bearing degradation is provided. In addition, the licensee's proposal of performing vibration signature and crank case oil sample analysis on a periodic basis will further assist in detecting pump degradation.

The licensee has requested relief from the Code requirements for annual pump bearing temperature measurement based on the potential pump damage which may be experienced while running the pump at low flow rates for extended times. The Code requires the pumps to be run until the bearing temperature stabilizes (i.e., when three successive readings taken at 10 minute intervals do not vary by more than 3%). Based on the determination that the licensee's proposal provides a reasonable alternative to the Code requirements, and since the hardship of compliance, including possible pump damage caused by testing, would not be offset by a compensating increase in safety, it is recommended that relief be granted from measuring bearing temperature in accordance with 10CFR50.55a(a)(-3)(ii), provided the licensee reviews the periodic oil sample and signature analysis program to ensure that the frequency is adequate to detect degradation in a timely manner.

2.2 Generic Pump Relief Request 4

2.2.1 *Relief Request:* The licensee has requested relief from measuring various pumps' bearing vibration amplitude in accordance with ASME Section XI, paragraphs IWP-3100 and 4500.

2.2.2 *Alternate Testing:* The licensee proposes to measure vibration velocities in lieu of amplitudes. The vibration velocity acceptable, alert, and required action ranges will be calculated based on ASME Section XI, Table IWP-3100-2 by "converting the displacement values...In other words, if the displacement reference value was multiplied by two in order

to calculate the "alert" limit, then the velocity reference value would be multiplied by two to obtain the same limit.

2.2.3 *Licensee's Basis for Relief:* The licensee states: "Vibration can be measured as Acceleration, Velocity or Displacement. Because it is related directly to the kinetic energy dissipated in a machine through vibration, velocity comes closest to being a direct measurement of the potential for mechanical damage to the machine, regardless of the frequency of the vibration. Velocity is a good measurement mode, regardless of the speed of the machine. Displacement or acceleration measurements are of less value unless frequency of the vibration is also known.

Consider a machine experiencing large displacements at very low frequency. The potential of equipment damage under these conditions would be very low. But, increase the speed of the machine, and the potential for damage could be considerable. Without the accompanying frequency information, the displacement measurement only tells part of the story. The same applies to acceleration data. Knowledge of the frequency of the vibration is needed if accurate assessment of the potential for damage is to be determined. This Relief Request meets the intent of GL89*04 and does not require advance approval by the NRC."

2.2.4 *Evaluation:* In this relief request, the licensee has requested relief from the Section XI requirements for various pumps. The licensee has not identified which pumps this request is applicable to, in either the request itself or in the Pump Test Table, Table 3 of Procedure EM-09-04. This evaluation assumes that relief is requested for all pumps in the IST Program. The relief request's basis states that it meets the intent of Generic Letter 89-04. The Generic Letter does not address the subject of this request. Therefore it is unclear what this statement is referring to. NRC Regulatory Guide 1.147 references ASME Code Case N-465. This Code Case approves the use of ASME/ANSI OMa-1988, Part 6, provided that it is used in its entirety. However, this relief request does not reference the OM Standard.

It is widely recognized in the industry that for pumps with a high rotating shaft speed, vibration velocity can better assess pump condition than displacement. A comprehensive pump testing program, such as that contained in ASME/ANSI OMa-1988, Operation and Maintenance of Nuclear Power Plants, Part 6, using vibration velocity readings taken over a wide frequency range can provide a great deal of information about pump mechanical condition that could not be obtained by using vibration displacement readings. However, for pumps with speeds less than 600 rpm, displacement is a better indicator of bearing condition. The displacement may be very large while the velocity is quite low, and thus equipment damage may be occurring. The OM Standard, nevertheless, allows the use of either displacement or velocity.

The licensee has proposed calculating the alert and reference velocity values based on the same relationship applied to displacement reference values. The example given

states that if the displacement alert limit is twice the reference value, the velocity alert limit will be twice the reference value. This relationship applies to displacement reference values between 0.5 and 2.0 mils. However, for reference amplitudes between 2 and 5 mils, the alert range is between (V_r +2 mils) and (V_r +4 mils). Therefore it is unclear exactly which relationships will be applied. Additionally, the licensee has not provided any information on which direction(s) and plane(s) the velocity measurement will be taken.

The licensee has provided insufficient information to evaluate this relief request. The NRC Staff encourages the use of vibration velocity, however, the licensee should provide specific velocity ranges for the acceptable, alert and required action ranges, information on the vibration measurement requirements, and clarify the pumps for which this relief applies. If the licensee adopts Code Case N-465, relief is not required. As discussed in ASME Code Case N-427, any Code Cases utilized should be identified in the IST Program.

3.0 VALVE IST PROGRAM RELIEF REQUESTS

In accordance with 10CFR50.55a, Consumers Power has submitted relief requests for specific valves at the Palisades Nuclear Plant which are subject to inservice testing under the requirements of ASME Section XI. These relief requests have been reviewed to verify their technical basis and determine their acceptability. Each relief request is summarized below, along with the technical evaluation by BNL.

3.1 Engineering Safeguards System

3.1.1 Hot Leg HPSI Check Valves, Valve Relief Request 1

3.1.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the High Pressure Safety Injection (HPSI) to Reactor Coolant System (RCS) Hot Leg Check Valve, CK-ES3410, open quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.1.1.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valve each cold shutdown and full-stroke exercising the valve each refueling outage.

3.1.1.3 *Licensee's Basis for Relief:* The licensee states: "Full-stroke testing during hot plant conditions is not performed for the following reasons:

1. A full flow test path is not available during plant conditions greater than cold shutdown (reactor vessel head removed or equal) due to nozzle thermal shock considerations.

2. Full flow testing cannot be performed during cold shutdowns (reactor vessel head installed) due to Technical Specification HPSI pump operability limitations."

3.1.1.4 *Evaluation:* This check valve performs a safety function in the open direction to allow flow from the HPSI or charging pumps into the RCS hot leg and in the closed direction to prevent leakage from the RCS into the HPSI system. This valve should not be tested by injecting water into the RCS during operation or hot shutdowns because the relatively colder charging water from the volume control tank could cause thermal shock to the RCS hot leg. The HPSI pump discharge pressure (1750 psig) is not sufficient to overcome the RCS pressure. During cold shutdowns, when the RCS cold leg temperature is less than 260°F and the vessel head is installed, both SI pumps are rendered inoperable to prevent low temperature overpressurization. The licensee has proposed a partial-stroke exercise during cold shutdowns, using the charging pumps and discharging to the Primary Coolant Drain tank. The licensee has not discussed partial-stroke exercising the valve quarterly in this relief request using the Primary System Drain tank. However, manually isolating the RCS using the 2" valve, PC1094A, and discharging the fluid to the Primary System Drain Tank is not practical during operation because a containment entry would be required, only one valve would isolate the RCS from the Primary System Drain Tank, the valve could be only partially stroked and the RCS system would be isolated preventing hot leg injection. Full-stroke testing using the SI pumps is possible only in the refueling operational mode, when the vessel head is removed. Requiring the licensee to shutdown and remove the vessel head quarterly for the purpose of valve testing would be excessively burdensome. The licensee's proposal which includes quarterly partial-stroke exercises provides reasonable assurance of the valve's operational readiness.

Therefore, based on the impracticality of full-stroke exercising the valve quarterly, relief is recommended in accordance with 10CFR50.55a(g)(6)(i).

3.1.2 Safety Injection Tank Check Valves, Valve Relief Request 2

3.1.2.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the SI tank check valves; CK-3102, ES3117, ES3132, and ES3147; open quarterly in accordance with ASME Section XI, paragraph IWV-3521.

3.1.2.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves at hot shutdowns and full-stroke exercising the valves during refueling outages or disassembling and inspecting a minimum of one valve.

3.1.2.3 *Licensee's Basis for Relief:* The licensee states: "The above check valves cannot be full or partial stroke exercised during normal power operations since exercising the valves open requires discharging highly borated water from the Safety Injection Tanks (SIT) to the Primary Coolant System (PCS). This test path is not possible since the PCS is normally

at a pressure of approximately 2500 psig and the normal pressure of the SIT is approximately 200 psig."

3.1.2.4 *Evaluation:* These check valves perform a safety function in both the open and closed directions. Closed they prevent leakage from the high pressure RCS from overpressurizing the lower pressure SI tank. During emergency core cooling system injection, these valves open allowing flow from the SI tanks into the RCS.

These valves cannot be full-stroke exercised during normal power operation because the only full-flow path is into the RCS and the SI tanks' operating pressure is substantially less than the normal RCS operating pressure. At reduced RCS pressures, partial-stroke exercising is possible, however undesirable due to possible thermal and power transients induced by injecting relatively cold borated water. The licensee has not however provided a justification for not full-stroke exercising the valves at cold shutdowns as allowed by ASME Section XI, paragraph IWV-3522.

Additionally, FSAR paragraph 6.1.3.1.2 describes a test method for partial-stroke exercising the valves using a test line to the primary system drain tank. The current revision of the FSAR (Revision 12) discusses testing the SIT check valves at hot shutdowns. Previous revisions of the FSAR discussed testing using this method during operation. In the relief request the licensee only discusses partial-stroke testing at hot shutdowns. The licensee should provide a justification for not partial-stroke exercising the valves quarterly using this test line.

The licensee proposes in the Alternative Testing paragraph of the relief request, full-stroke exercising the valves or disassembling and inspecting a minimum of one valve each refueling outage. Full-flow testing of the valves is required unless such testing is impractical. The licensee should perform full-flow testing at refueling outages or submit justification why this testing is impractical. Based on the lack of sufficient justification, relief cannot be recommended. The licensee should resubmit this relief request.

3.1.3 HPSI Pressure Isolation Check Valves, Valve Relief Request 4

3.1.3.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the HPSI header pressure isolation check valves; CK-ES3104, 3119, 3134, and 3149; open quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.1.3.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves at cold shutdowns and full-stroke exercising the valves "during refueling outages (reactor vessel head removed or equivalent)."

3.1.3.3 *Licensee's Basis for Relief:* The licensee states: "These check valves cannot be full-stroke exercised during normal power operation since the test path required to stroke open the check valves requires injecting highly borated water into the Primary Coolant System

(PCS) which would result in a reactivity change power reduction and possibly a pressure/temperature transient. This test flowpath is not available during normal operations since the PCS is at a greater pressure than the HPSI/RHPSI pump discharge. In addition, the potential for an intersystem LOCA would be created if any check valve should fail, due to PCS operating pressure being greater than HPSI system design pressure. Testing at any plant condition greater than cold shutdown (reactor vessel head removed or equal) will result in thermal shock to the injection nozzles.

Full-stroke testing is not possible during cold shutdown periods due to Technical Specification 3.3 pump operability limitations below 260°F (Low Temperature Overpressurization - 10CFR50 Appendix G)."

3.1.3.4 *Evaluation:* These check valves perform a safety function in both the open and closed directions. Closed they act as Event V Primary Coolant System Pressure Isolation Valves (Technical Specification 4.3), preventing leakage from the high pressure RCS from overpressurizing the lower pressure SI system. During emergency core cooling system injection, these valves open allowing flow from the HPSI pumps into the RCS. This relief request only addresses the test requirement in the open direction. Cold Shutdown Justification 27 addresses the test requirement in the closed direction.

These valves cannot be full-stroke exercised during normal power operation because the only full-flow path is into the RCS and the HPSI pump's operating pressure is less than the normal RCS operating pressure. At reduced RCS pressures, partial-stroke exercising is possible, however undesirable due to possible thermal and power transients induced by injecting relatively cold borated water. Additionally full-stroke exercising the valves during cold shutdowns is impractical due to the low temperature overpressurization concerns. Both HPSI pumps are required to be inoperable when the reactor head is installed and the RCS cold leg temperature is less than 260°F in accordance with the Technical Specification 3.3.2g. Partial-stroke exercising the valves quarterly appears to be possible using the test line to the primary system drain tank, as discussed in the FSAR, paragraph 6.1.3.1.2. The licensee however, only proposes partial-stroke exercising the HPSI check valves at cold shutdowns and full-stroke exercising in the refueling operational mode. The licensee should provide a justification for not testing the valves quarterly using this test line.

If the Code requirements were imposed, the licensee would be required to shutdown and remove the vessel head quarterly or install full-flow test loops. Requiring the licensee to immediately partial-stroke exercise the valves quarterly would be burdensome since it could require testing by methods not yet evaluated or developed. The licensees proposal provides reasonable assurance of the valves operational readiness for an interim period.

Therefore, based on the impracticality of full-stroke exercising the valves quarterly or during cold shutdowns, and considering the burden on the licensee if the Code requirements were imposed and that the proposed alternate testing provides reasonable assurance of operational readiness, it is recommended that interim relief from full-stroke

exercising the valve quarterly be granted in accordance with 10CFR50.55a(g)(6)(i) for a period of one year or until the next refueling outage, whichever is later, to allow the licensee time to evaluate partial-stroke testing the valves quarterly.

3.1.4 Redundant HPSI Check Valves, Valve Relief Request 5

3.1.4.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the Redundant HPSI (RHPSI) header check valves; CK-ES3250, 3251, 3252, and 3253; open quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.1.4.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves at cold shutdowns and full-stroke exercising the valves "during refueling outages (reactor vessel head removed or equivalent)."

3.1.4.3 *Licensee's Basis for Relief:* The licensee states: "These check valves cannot be full-stroke exercised during normal power operation since the test path required to stroke open the check valves requires injecting highly borated water into the Primary Coolant System (PCS), which would result in a reactivity change power reduction and possibly a pressure/temperature transient. This test flow path is not available during normal operations since the PCS is at a greater pressure than the HPSI/RHPSI pump discharge. In addition, the potential for an intersystem LOCA would be created if any check valve should fail, due to PCS operating pressure being greater than HPSI system design pressure. Testing at any plant condition greater than cold shutdown (reactor vessel head removed or equal) will result in thermal shock to the injection nozzles.

Full-stroke testing is not possible during cold shutdown periods due to Technical Specification 3.3 pump operability limitations below 260°F (Low Temperature Overpressurization - 10CFR50 Appendix G)."

3.1.4.4 *Evaluation:* These check valves perform a safety function in both the open and closed directions. Closed they prevent leakage from the high pressure RCS from overpressurizing the lower pressure SI system. During emergency core cooling system injection, these valves open allowing flow from the RHPSI pumps into the RCS. This relief request is referenced in the IST Program, Valve Test Table (Attachment 5) for both the open and closed test direction. However the relief request only discusses the test requirement in the open direction. The licensee should revise the request to address testing the valve closed, if required. Additionally, the licensee should re-evaluate the category of these valves as they appear to function as pressure isolation valves, similar to HPSI valves CK-ES3104, 3119, 3134, and 3149, which are classified as A/C in accordance with IWV-2200 (Reference Valve Relief Request VRR-4).

These valves cannot be full-stroke exercised during normal power operation because the only full-flow path is into the RCS and the RHPSI pump's operating pressure is less than the normal RCS operating pressure. At reduced RCS pressures, partial-stroke

exercising is possible, however undesirable due to possible thermal and power transients induced by injecting relatively cold borated water. Additionally, full-stroke exercising the valves during cold shutdowns is impractical due to the low temperature overpressurization concerns. Both HPSI pumps are required to be inoperable when the reactor head is installed and the RCS cold leg temperature is less than 260°F in accordance with the Technical Specification 3.3.2g. Partial-stroke exercising the valves quarterly appears to be possible using the test line to the primary system drain tank, as discussed in the FSAR, paragraph 6.1.3.1.2. The licensee however, only proposes partial-stroke exercising the RHPSI check valves at cold shutdowns and full-stroke exercising in the refueling operational mode. The licensee should provide a justification for not testing the valves quarterly using this test line.

If the Code requirements were imposed, the licensee would be required to shutdown and remove the vessel head quarterly or install full-flow test loops. Requiring the licensee to immediately partial-stroke exercise the valves quarterly would be burdensome since it could require testing by methods not yet evaluated or developed. The licensee's proposal provides reasonable assurance of the valves operational readiness for an interim period.

Based on the impracticality of full-stroke exercising the valves quarterly or during cold shutdowns, and considering the burden on the licensee if the Code requirements were imposed and that the proposed alternate testing provides reasonable assurance of operational readiness, it is recommended that interim relief from full-stroke exercising the valve quarterly be granted in accordance with 10CFR50.55a(g)(6)(i) for a period of one year or until the next refueling outage, whichever is later, to allow the licensee time to evaluate and implement partial-stroke testing the valves quarterly.

3.1.5 SIRW Tank Check Valves, Valve Relief Request 7

3.1.5.1 *Relief Request:* The licensee has proposed relief from full-stroke exercising the Safety Injection and Refueling Water (SIRW) tank suction check valves, CK-ES3239 and 3240, open quarterly in accordance with ASME Section XI, open paragraphs IWV-3521 and 3522.

3.1.5.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves quarterly and disassembling/inspecting the valves "nominally once per ten years when there is a full core off-load and when fuel pool cooling loads are acceptable."

3.1.5.3 *Licensee's Basis for Relief:* The licensee states: "Full flow exercising these valves with flow is not possible during any plant condition, other than during a full core off-load and when fuel pool cooling loads are low, for the following reasons:

1. Flow paths do not exist which will pass the flow required to achieve a full-stroke test.

2. Valves cannot be disassembled, at times other than a full core offload when fuel pool cooling loads are low, because they cannot be isolated from the SIRW tank."

3.1.5.4 *Evaluation:* These 18-inch check valves perform a safety function in the open and closed positions. Open, the valves supply water from the SIRW tank to the 14 inch containment spray, 14 inch LPSI, and 6 inch HPSI pumps suction. They close and are required to be leak tested to ensure water from the containment sump and shutdown cooling does not back flow into the vented SIRW tank. This issue is discussed in NRC Information Notice 91-56. (Note: Valve MO3198, which isolates the containment sump and SIRW tank from reactor coolant during shutdown cooling, is a Category B valve and is not leak tested. Therefore, these check valves are assumed to perform the RCS isolation function.)

This relief request is referenced in the IST Program Valve Test Table (Attachment 5) for the open and closed test direction, as well as for leak testing. However, the relief request only discusses the test requirement in the open direction and does not provide a basis for not back flow testing the valves quarterly or during cold shutdowns, or leak testing the valves at least once every 2 years. This evaluation only addresses the full-stroke open test requirement. The licensee should revise the relief request or attachments as appropriate.

Additionally, ASME Section XI and Generic Letter 89-04, Position 3, allows verification of a valve in the closed direction to be done by visual observation, by an electrical signal initiated by a position-indicating device, by observation of appropriate pressure indication in the system, by leak testing, or by other positive means. It is the opinion of the NRC Staff that disassembly may be used for verifying valve closure when no other means of verification is possible. Disassembly provides limited information on the valve's capability to seat promptly on cessation or reversal of flow. The licensee should investigate the use of leak testing quarterly or during cold shutdowns to determine valve closure.

In regards to full-stroke exercising the valves; testing with the maximum required accident flow through the valves (6000 gpm per the Relief Request) is not practical during operation, cold shutdowns, or refueling outages because there are no full-flow test loops in the containment spray, LPSI or HPSI systems. Full-stroke testing would require spraying the containment in addition to the LPSI pumps discharging design flow rates into the RCS. This would be impractical. The licensee's proposed partial-stroke testing quarterly at 1000 gpm and disassembling and inspecting both valves when there is a full core offload and when fuel pool cooling loads are acceptable.

There is no means of isolating the check valves from the SIRW tank. In order to disassemble the valves, the tank must first be drained. The Technical Specifications require the SIRW tank to be operable during power operation. During all refueling outages, the

SIRW tank is partially drained to the refueling cavity. The licensee has not provided an explanation for not draining the SIRW tank and disassembling and inspecting one valve at each refueling outage. The NRC Staff in Generic Letter 89-04, Attachment 1, Position 2 states that disassembly and inspection is an acceptable alternative to full-flow testing provided that one valve in each group is inspected each refueling outage. In the cases of extreme hardship, extension of the disassembly/inspection intervals to longer than once every 6 years is acceptable provided the licensee (1) Disassembles and inspects each valve and documents in detail the condition of each valve and its capability to be full-stroked, (2) Reviews industry experience regarding the same type of valves used in similar service, and (3) Reviews the installation of each valve for problematic locations. Relief from full-stroke exercising the valves is granted in accordance with Generic Letter 89-04, provided the licensee meets all the criteria in Position 2 including those required to justify extending the disassembly and inspection interval.

3.1.6 HPSI Pumps' Discharge Check Valves, Valve Relief Request 8

3.1.6.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the HPSI pumps' discharge check valves; CK-3177, -3186,and -ES3411; in the open and closed direction quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.1.6.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves open quarterly and full-stroke exercising the valves open during refueling outages, and disassembling/inspecting the valves to verify closure capability.

3.1.6.3 *Licensee's Basis for Relief:* The licensee states: "To full-stroke exercise these valves requires injecting SIRW tank water into the Primary Coolant System (PCS). This test path is not available during normal operations since the PCS is at a greater pressure than the HPSI/RHPSI pump discharge. Also the injection of the highly borated SIRW tank water into the Primary Coolant System (PCS) would result in a reactivity change power reduction and possibly a pressure/temperature transient. Testing at any plant condition greater than Cold Shutdown (Reactor Vessel head removed or equivalent) will result in thermal shock to the injection nozzles."

Full-stroke testing is not possible during cold shutdown periods due to Technical Specifications 3.3 pump operability limitations below 260°F (Low Temperature Over-pressurization - 10CFR50 Appendix G).

To full-stroke exercise this valve to the close position requires quantitatively verifying flow in the reverse direction when the valve is seated. This test is not possible during any mode of operation since no direct or indirect method of quantitative reverse flow verification exists."

3.1.6.4 *Evaluation:* These check valves perform a safety function in both the open and closed directions. They open to allow the HPSI pumps to discharge into the RCS and close

to prevent back flow through the pumps. This relief request addresses the test requirements in the open and closed direction.

These valves cannot be full-stroke exercised during normal power operation because the only full-flow path is into the RCS and the HPSI pumps' operating pressure is less than the normal RCS operating pressure. Additionally, full-stroke exercising the valves during cold shutdowns is impractical due to the low temperature overpressurization concerns. Both HPSI pumps are required to be inoperable when the reactor head is installed and the RCS cold leg temperature is less than 260°F in accordance with the Technical Specification 3.3.2g. The licensee proposes to partial-stroke exercise the valves quarterly.

If the Code requirements were imposed, the licensee would be required to shutdown and remove the vessel head quarterly or install full-flow test loops, which would be burdensome. The licensee's proposal provides reasonable assurance of the valves operational readiness.

Therefore, based on the impracticality of full-stroke exercising the valves quarterly or during cold shutdowns, and considering the burden on the licensee if the Code requirements were imposed and that the proposed alternate testing provides reasonable assurance of operational readiness, it is recommended that relief from full-stroke exercising the valve be granted in accordance with 10CFR50.55a(g)(6)(i).

In regard to exercising the valves closed, the licensee states that "quantitatively verifying flow in the reverse direction" is required. ASME Section XI and Generic Letter 89-04, Attachment 1, Position 3, allows verification of a Category C valve is in the closed direction to be done by visual observation, by an electrical signal initiated by a position-indicating device, by observation of appropriate pressure indication in the system, by leak testing, or by other positive means. It is the opinion of the NRC Staff that disassembly can be used for verifying valve closure when no other means of verification is possible. Disassembly provides limited information on the valve's capability to seat promptly on cessation or reversal of flow. The licensee should investigate the use of non-intrusive testing techniques or system parameters to determine valve closure. These techniques should be implemented if they are demonstrated to be effective to assess closure capability. Therefore, it is recommended that interim relief for closure testing be granted in accordance with 10CFR50.55a(g)(6)(i) for a period of one year or until the next refueling outage, whichever is later, to allow the licensee time to evaluate alternate testing methods. In the interim, disassembly and inspection provides reasonable assurance of the valves' capability to close.

3.1.7 Hot Leg HPSI Check Valves, Valve Relief Request 16

3.1.7.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the High Pressure (HPSI) and Redundant High Pressure Safety Injection (RHPSI) to RCS Hot Leg

Check Valves, CK-ES3408 and 3409, open quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.1.7.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves quarterly and full-stroke exercising the valves during refueling outages with the reactor vessel head removed.

3.1.7.3 *Licensee's Basis for Relief:* The licensee states: "To full-stroke exercise these valves requires injecting SIRW tank water into the Primary Coolant System (PCS). This test path cannot be used during normal power operations since the PCS is at a greater pressure than the HPSI pump discharge. Also the injection of the highly borated SIRW tank water into the Primary Coolant System (PCS) would result in a reactivity change power reduction and possibly a pressure/temperature transient. Testing at any plant condition greater than Cold Shutdown (reactor vessel head removed or equivalent) would result in thermal shock to the injection nozzles.

Full-stroke testing is not possible during cold shutdown periods due to Technical Specifications 3.3 pump operability limitations below 260°F (Low Temperature Over-pressurization - 10CFR50 Appendix G)."

3.1.7.4 *Evaluation:* These check valves perform a safety function in the open direction to allow flow from the HPSI and RHPSI trains and charging pumps into the RCS hot leg, and in the closed direction to prevent leakage of the RCS into the HPSI and RHPSI system. These valves cannot be full-stroke exercised during power operation because the only full-flow path is into the RCS. The discharge pressure of the HPSI pumps cannot overcome the normal RCS operating pressure. Injection at reduced RCS pressures is impractical because of the possible thermal/power transients introduced by the relatively cold borated water form the SIRW Tank. Additionally, full-stroke testing at cold shutdowns when the reactor vessel head is installed is impractical because a low-temperature over-pressure condition could occur. Plant Technical Specifications impose high-pressure pump operability limits for this plant condition. Partial-stroke exercising the valves quarterly is possible using the primary system drain tank. Requiring these valves to be full-stroke exercised quarterly would require the plant to be shutdown and the head removed or extensive system modifications to be performed, such as installing full-flow test loops. These constraints/modifications would be costly and burdensome to the licensee.

Based on the impracticality of full-stroke exercising these valves quarterly or during cold shutdowns, the burden on the licensee if these Code requirements were imposed and considering that proposed alternate testing provides reasonable assurance of operational readiness, it is recommended that relief be granted in accordance with 10CFR50.55a(g)(6)(i).

3.2 Service Water System

3.2.1 Service Water to EDGs Isolation Valves, Valve Relief Request 10

3.2.1.1 *Relief Request:* The licensee has requested relief from quarterly stroke time testing of the air operated valves (CV-0884 and 0885), which supply service water to the EDGs in accordance with ASME Section XI, paragraph IWV-3413.

3.2.1.2 *Proposed Alternate Testing:* The licensee has proposed testing these valves three times per quarter in conjunction with EDG tests. Jacket water pressure and temperature will be monitored to demonstrate valve degradation in lieu of stroke time measurement.

3.2.1.3 *Licensee's Basis for Relief:* "Technical Specifications require the EDGs to be functionally tested on a monthly basis. This entails starting, loading and continued operation to verify operability of the EDG and its support systems. These valves are normally closed and fail open on a diesel start, they do not have position switches to locally or remotely exercise the valves. Degraded valve operability would be detected through the performance of the EDG Test, therefore relief is requested from the timing requirements of IWV-3413. Performance of (valve test procedures) MO-7A-1 and MO-7A-2, in lieu of quarterly stroke time testing, is an acceptable alternative for the following reasons:

1. MO-7A-1 and MO-7A-2 are performed three times per quarter, as opposed to a quarterly procedure which would only be performed once,

2. MO-7A-1 and MO-7A-2 monitor jacket water pressure and temperature to determine acceptable subsystem performance, and

3. MO-7A-1 and MO-7A-2 apply acceptable, alert, and required action ranges to jacket water pressure and temperature. This action is a suitable alternative to stroke time measurements for monitoring valve degradation.

Recorded values in the acceptable range per MO-7A-1 and MO-7A-2 constitutes an acceptable test for the subject valves."

3.2.1.4 *Evaluation:* The purpose of these normally closed, 6-inch air-operated valves is to open upon demand to supply service water to the EDGs to provide the cooling necessary to support continued EDG operation.

For power operated valves, ASME Section XI, paragraphs IWV-3412 and 3413 require that the valves be tested quarterly, that a limiting value for full-stroke operation be defined for the valves, and that the full-stroke time be measured. ASME Section XI, paragraph IWV-3417 also requires that the results be compared to those obtained from the previous test to detect degradation.

The licensee, in lieu of performing stroke time measurements quarterly, has proposed monitoring the EDG jacket water pressure and temperature, and to compare these values with predetermined action ranges to detect valve degradation during regularly scheduled EDG tests (3 times per quarter). While monitoring these parameters may provide some indication of valve position, it does not provide an indication of valve degradation. Variations in jacket water pressure and temperature may be due to other causes in addition to valve degradation. Monitoring valve actuation time, however, provides an accurate and reliable indication of valve degradation. A review of P&ID M-208-1A indicates that there are two flow elements (FE-0890 and 0891) located upstream from the valves which could be used to indicate flow rate. The licensee could evaluate valve "stroke time" based on the time to achieve design flowrates. The instruments' accuracy and calibration should meet the requirements of Section XI.

These cooling water supply valves are not equipped with control switches or position indication. They stroke only in response to signals from the diesel generator control circuitry. System modification would be necessary to directly measure valve stroke times. System or valve modifications would be expensive and burdensome to the licensee, but may be prudent to allow the detection of valve degradation. Some method of stroke timing or otherwise evaluating the condition of these valves is necessary for determining their operational readiness. The licensee should actively pursue an alternate method for stroke time testing these valves. Methods employing magnetic, acoustics, ultrasonics, or other technologies should be investigated for their suitability.

Based on the determination that immediate compliance with the Code requirements is impractical and considering the licensee's proposal, it is recommended that provisional relief for an interim period of one year, or until the next refueling outage, whichever is later, be granted in accordance with 10CFR50.55a(g)(6)(i). The licensee's proposal of measuring jacket water temperature and pressure during surveillance testing provides reasonable assurance of the valves operational readiness for the interim period provided the licensee also utilizes the time to achieve design flowrates. However, this will not adequately evaluate valve condition and does not present a reasonable long term alternative to the Code requirements. During this period, the licensee should develop a method of measuring the stroke times, or some other means of adequately assessing the condition of these valves.

3.2.2 Service Water Containment Air Cooler Check Valves, Valve Relief Request 19

3.2.2.1 *Relief Request:* The licensee has requested relief from quarterly, full-stroke exercising the containment air cooler check valves CK-SW407,408,409, and 410, open, as required by ASME Section XI, paragraphs IWV-3521 and 3522.

3.2.2.2 *Proposed Alternate Testing:* The licensee has proposed a valve disassembly and inspection program in lieu of full-flow testing.

3.2.2.3 *Licensee's Basis for Relief:* "To verify full-stroke exercise capability requires quantitatively verifying each of the above valves passes design accident flow rate. This test is not possible to perform since no direct or indirect method of quantitative flow verification exists."

3.2.2.4 *Evaluation:* These four valves are 8-inch, self-actuating check valves which are normally open providing a flow path for the service water discharge from the air coolers. ASME Section XI, paragraphs IWV-3521 and 3522, require that these check valves be tested quarterly to ensure the disc moves promptly away from the seat upon initiation of flow. As per Generic Letter 89-04, Position 2, the most common method to full-stroke exercise a check valve open is to pass the maximum required accident flow through the valves. The licensee has stated in the relief request that a full-flow test is not possible since no direct or indirect method of quantitative flow verification exists. However, P&ID Drawing M-208-1B indicates that five flow elements are located on the upstream side of the check valves (FE0833, 1770, 1771, 1772, and 1773) and one on the return header (FE0884). These would allow the direct measurement, or calculation, of the flow rate through each of the check valves. Position 1 of Generic Letter 89-04 permits the licensee to use alternates to full-flow testing, including disassembly, only when a full flow-test is impractical. This does not appear to be the case here. The licensee should investigate using the flow elements to provide a quantitative flow measurement through the four check valves in lieu of the proposed disassembly.

Immediate imposition of the Code requirements could be a hardship to the licensee as it may result in the licensee performing tests with procedures and methods not yet fully developed, which may result in the valves being unnecessarily declared inoperable. An interim period is necessary to provide the licensee time to evaluate alternate test methods to demonstrate the full stroke capability of these valves. The proposed alternate test plan consisting of valve disassembly and inspection provides reasonable assurance of the valves operational readiness for the interim period, provided all the criteria contained in Generic Letter 89-04, Position 2 are met.

It is recommended that relief for an interim period of one year, or until the next refueling outage, whichever is later, be granted in accordance with 10CFR50.55a(a)(3)(ii). In the interim, the licensee should evaluate full-flow testing.

3.2.3 Service Water Pump Discharge Check Valves, Valve Relief Request 27

3.2.3.1 *Relief Request:* The licensee has requested relief from ASME Section XI, paragraphs IWV-3521 and 3522, which require quarterly testing to verify the service water pump discharge check valves CK-SW401,402,and 403 full-stroke open and closure capability.

3.2.3.2 *Proposed Alternate Testing:* In lieu of the above requirements, the licensee has proposed to partial stroke these valves quarterly, and to disassemble and inspect them

during refueling outages. At each disassembly, the valve will be manually exercised to verify full stroke capability.

3.2.3.3 *Licensee's Basis for Relief:* "Full flow exercising these check valves to the open position requires knowledge of the individual pump flow rates. Individual pump units do not have installed flow indicators and piping configuration will not allow an installation of indicators which meet Code requirements.

To full stroke exercise this valve to the close position requires quantitatively verifying flow in the reverse direction when the valve is seated. This test is not possible during any mode of operation since no direct or indirect method of quantitative reverse flow verification exists."

3.2.3.4 *Evaluation:* These three valves are 16-inch, Class 3 check valves located on the discharge side of the three service water pumps. Depending upon the operational status of the pumps, these valves are either normally open or closed, and provide a safety function in both positions. When open, a flowpath for the service water is provided, and closed, backflow to the pumps is prevented.

As defined by ASME Section XI, paragraphs IWV-3521 and 3522, these valves are required to be verified operational in the full open and closed position quarterly. Guidance on meeting these requirements is provided in Generic Letter 89-04, Positions 1, 2, and 3. As stated in the response to Question 24 contained in the Minutes Of The Public Meetings on Generic Letter 89-04, valves which perform safety functions in both the open and closed positions are required to be exercised to the full open position, and then verified to close.

In order to verify the valves ability to stroke to the full open position, the maximum required accident flow rate must be passed through the valve. As stated in the Basis above, there are no means to quantitatively verify flow rates through each check valve. Verification that the valve is in the closed position can be performed by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate system pressure indications, or by other positive means. The NRC staff's position is that a disassembly and inspection program may be instituted as a means of demonstrating the full open and closure capability of the valve provided there are no other means of verification possible. Although such a program is acceptable for verifying valve closure, only limited information on the valves ability to seat promptly upon flow reversal or cessation is gained. Based upon a review of P&ID M-213, there appears to be means, other than disassembly, of reverse flow testing (e.g. by leak testing, or by observation of pressure indication). It is recommended that the licensee investigate the use of other testing techniques, and to implement those which are demonstrated effective. The infrequent disassembly and inspection of valves is appropriate to assess overall check valve condition, while reverse flow testing provides an assessment of continued operational readiness. Therefore, it is recommended that relief from reverse flow testing be denied.

Based upon the impracticality of performing a full-stroke exercise with flow, the burden of imposing the Code requirements, which would require a major system modification to install flow instrumentation, and that the licensee's proposed disassembly and inspection program provides reasonable assurance of operational readiness, it is recommended that provisional relief from full-stroke exercising the valve open be granted in accordance with Generic Letter 89-04, provided all the provisions specified in Position 2 are satisfied.

3.3 Component Cooling Water System

3.3.1 Component Cooling Isolation Valves, Valve Relief Request 12

3.3.1.1 *Relief Request:* The licensee has requested relief from the stroke time measuring and test frequency requirements, in accordance with ASME Section XI, paragraphs IWV-3411 and 3413 for the component cooling isolation valves, CV-0944 and 0977B, to and from the rad waste evaporators.

3.3.1.2 *Proposed Alternate Testing:* The licensee has proposed testing these valves during every cold shutdown, but not more frequently than once each quarter, with no stroke time measurements.

3.3.1.3 *Licensee's Basis for Relief:* "CV-0944 and CV-0977B are normally open valves which close on SIS. There are no position switches to locally or remotely stroke the CVs. The SIS test is manpower intensive and would be difficult to coordinate accurate stroke timing. Relief is requested from the timing requirement of IWV-3414 for CV-0944 and CV-0977B."

"Testing per QO-1("Safety Injection System") verifies that the subject valves will travel to the close position. This is considered adequate for the following reasons:

1. The valves are testing in the mode in which they would be called upon to mitigate an accident.

2. Should one or both of these valves fail to close during an accident, an increase in flow demand of approximately 200 gpm (per FSAR Table 9.5) would be experienced. This flow increase represents approximately 3 percent of one pump's flow capacity. Should this type of failure occur, there would remain approximately 1600 gpm of excess capacity from the Component Cooling pumps."

3.3.1.4 *Evaluation:* These component cooling isolation valves are 10-inch, air operated, butterfly valves, which are normally open providing CCW flow to the rad waste evaporators. Upon ESF actuation, these valves close to isolate all non-essential system loads, including the rad waste evaporators. Relief has been requested from the Code requirements for quarterly stroke time testing of these valves. As an alternative, the licensee has proposed

to demonstrate the closure capability of these valves, without any stroke time measurements, each cold shutdown (but not more than once per quarter).

As described in Generic Letter 89-04, Position 5, the intent of the Code requirements with respect to measuring valve stroking time for air-operated valves is to verify operation and detect degradation. The licensee is required to specify the full stroke time for each valve and to take corrective action as specified in IWV-3417(b) when these values are exceeded. The purpose of designating a limiting stroke time is to perform corrective action on a degraded valve before the valve reaches the point where there is a high probability of failure. Position 5 of Generic Letter 89-04 also provides guidance to the licensee for establishing these limiting values.

The licensee has failed to provide sufficient justification to support granting relief from measuring stroke times. As indicated on P&ID M-209 Sh. 3, both valves are equipped with position indicators which may be utilized for stroke time testing. Additionally, justification has not been provided in the relief request to demonstrate why the licensee can't perform the required tests quarterly as per Code. However, as discussed in the basis for Technical Specification 4.6, testing cannot be performed during reactor operation because a safety injection signal will cause containment isolation. Therefore, testing the valves at cold shutdowns is an acceptable alternative in accordance with IWV-3412(a).

Based on the lack of sufficient justification, it is recommended that relief from measuring stroke times be denied. The licensee should measure stroke times during cold shutdowns, and perform corrective actions in accordance with the Code.

3.3.2 Component Cooling Water Check Valves, Valve Relief Request 13

3.3.2.1 *Relief Request:* The licensee has requested relief from full stroke exercising check valves CK-CC401 and CK-CC402 open quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.3.2.2 *Proposed Alternate Testing:* In lieu of quarterly full stroke testing, these valves are partial stroke exercised every three months. The check valves are also disassembled and inspected, including a manual full stroke exercise.

3.3.2.3 *Licensee's Basis for Relief:* "To full-stroke exercise these valves requires quantitatively verifying each valve passes design accident flow. This test is not possible during any mode of operation since no direct or indirect method of quantitative flow verification exists. An acceptable test occurs when these valves meet the flow requirements of Inservice Test Procedures QO-10 "Containment Spray and LPSI Check Valve Test," QO-19 "HPSI Pumps," and QO-20 "LPSI Pumps".

3.3.2.4 *Evaluation:* These 3-inch check valves, as described by the licensee in the Valve Test Table (Attachment 5), are normally open allowing flow from the HPSI, Containment Spray,

and LPSI pump cooling to the service water backup return, and close to prevent backflow. The safety position for these valves, as specified in Attachment 5, is both open and closed. As discussed in Generic Letter 89-04, Position 3, and The Supplement To Minutes Of The Public Meeting On Generic Letter 89-04, check valves which perform a safety function in both the closed and open positions are required by Code to be exercised to the open position, and then be verified closed. These valves are classified as Category C and, as such, the requirements of ASME Section XI, paragraph IWV-3521 and 3522 are applicable. Therefore, the valves are required to be exercised to their position of function quarterly.

The licensee has requested relief from full-stroke exercising these valves open, since it would require quantitatively verifying each valve passes the design accident flow. As stated in this relief request, this test is not possible during any operational mode since no direct or indirect method of quantitative flow verification exists. However, P&ID M-209-2 shows flow indicators on the upstream side of each of the seven ESF pumps. The licensee should investigate using these instruments to provide a quantitative indication of flow through the check valves.

As defined in Position 2 of Generic Letter 89-04, check valve disassembly and inspection may be used as a positive means of determining that the valve's disc will full stroke exercise open or of verifying closure capability, as required by paragraph IWV-3522. During this process, the valve's internals should be visually inspected for worn or corroded parts, and the valve disc manually exercised. The NRC, recognizing the effort required to disassemble and inspect check valves, provided specific guidance to the licensee permitting the grouping of similar valves, and allowing one valve from the group to be tested each outage on a rotating basis with a six-year limit between inspections for any one valve in the group.

Verification that these valves are in the closed position is also required. As described in Generic Letter 89-04, Position 3, this verification may be done by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indication in the system, by leak testing, or other appropriate means. The licensee has referenced this relief request in Attachment 5 for testing the valve in the closed position. The relief request's Basis, Test Requirements, and Alternate Testing sections do not address this test requirement or provide justification. Also, it appears possible to perform a leak test valve closure. The licensee should perform closure verification in accordance with the Code. Otherwise, a new or revised relief request addressing this test requirement is required. Appendix 5 should also be revised accordingly.

Additionally, as described above, Attachment 5 of the IST Program submittal classifies these valves as being normally open. However, P&ID drawing M-209-2 shows two normally closed, air-operated valves (CV-0950 and 0951) downstream of the check valves. Upon actuation of the pumps, the exit flow is directed to either component cooling circulating pump suction or service water system by opening one of these air-operated valves. Both of these air-operated valves are normally closed. This would indicate that

there is no flow past these check valves, meaning that they are normally closed, and only open upon initiation of pump cooling flow. The check valves close to prevent backflow to the pumps from the common discharge header. The licensee should review the documentation submitted, and revise Attachment 5 as needed.

The Baseline Data supplied by the licensee in the text of this relief request provides information in the event of valve failure and an upstream pipe break, including the excess capacity that would be available to the Component Cooling pumps. Based upon this information, the licensee concludes that "these valves shall be classified as Category B, and part stroke tested at least once per quarter." This classification is incorrect since the valves are check valves. It is also unclear what the significance of the information provided by the licensee in the Baseline Data section is to this Relief Request.

In lieu of full-stroke exercising these valves quarterly, the licensee has proposed a valve disassembly and inspection plan to verify valve operability. Disassembly and inspection in accordance with Generic Letter 89-04, Position 2 is an acceptable alternative to full stroke exercising when there is no other means to verify full-stroke operation. The licensee has not provided justification for not full-stroke exercising the valve with flow or verifying closure capability.

Based upon the above evaluation, it is recommended that relief be denied. The licensee should reevaluate this relief request, correct the discrepancies noted, and resubmit the request if it is still required.

3.4 Primary Coolant System

3.4.1 Power Operated Relief Valves, Valve Relief Request 15

3.4.1.1 *Relief Request:* The licensee has requested relief from the quarterly stroke testing requirements of ASME Section XI, paragraphs IWV-1100, 3413, and 3417 for the pressurizer PORV's PRV-1042B and 1043B.

3.4.1.2 *Proposed Alternate Testing:* The licensee proposes to use the solenoid actuator to stroke the PORV's from the full-closed to a full-open position, without specifying a limiting stroke time. This test will be performed each cold shutdown, but not more than once per quarter. Stroke times will be measured and trended for predictive purposes only. Each PORV and actuating circuit will be tested each refueling, and a limiting stroke time of 2 seconds shall be applied to this test.

3.4.1.3 *Licensee's Basis for Relief:* "Performance of testing which includes the entire PORV actuating circuitry poses an undo hardship for the following reasons:

1. This testing requires pressurization with Nitrogen between the block valves and the PORV. Radiation exposure is estimated at 300 mR per test of the

PORV and actuating circuits. Therefore, relief from the requirement of IWV-1100 is requested.

When stroked at zero differential pressure with the solenoid actuator, there are three primary forces which act on the PORV. The Coil Force tends to open the valves, while the Spring Force tends to close the PORV. Friction force opposes motion in either direction. Therefore, to have a healthy valve, the solenoid force must be greater than the friction force plus the spring force. This relationship is demonstrated when the valve successfully strokes from the closed to open position. Because each of these forces is small in comparison to system pressure forces, the ability to stroke (without specification of a limiting value of stroke time) represents acceptable valve degradation and operation.

Thus relief from the requirements of IWV-3413 and IWV-3417 is requested."

3.4.1.4 *Evaluation:* The PORV's (PRV-1042B and 1043B) are 4-inch, Category B, fast-acting, solenoid operated valves. These valves are normally closed, and fulfill a safety function in both the open and closed positions. They are designed to provide overpressure relieving capability during normal full power operation. However, they are normally isolated from the PCS, and consequently, are not available for automatic pressure relief during power operation. The PORVs would be used if a feed and bleed operation was required in an emergency shutdown situation (FSAR 4.3.9.3). The valves also provide overpressure protection for the PCS during periods of low temperature, water solid system operation.

In accordance with paragraph IWV-3410, these valves are required to be exercised to the position required to fulfill their safety function, quarterly. The licensee has requested relief from quarterly testing the entire PORV actuating circuitry since it would require pressurization with nitrogen between the block valves and the PORV, which would result in a personnel exposure of approximately 300 mR per test. It is unclear if this justification applies to quarterly testing or to cold shutdowns and refueling outages as well.

Additional justification was provided in Cold Shutdown Testing Basis 22, which stated that opening these valves during power operation creates the possibility of a LOCA with a single failure of the associated PORV block valve. Also, the valves are not required to be operable while the plant is operating per the Technical Specifications. In lieu of quarterly testing, the licensee has proposed stroking the SOV using the solenoid actuator at each cold shutdown (but not necessarily more than once per quarter).

The ability to move from the full closed to full open position constitutes an acceptable test. Stroke times will be measured and trended, however, "no stroke time limit shall be applied" (CSJ 22). Additionally, the valves will be tested at refueling outages and a limiting stroke time of 2 seconds will be applied.

The licensee has stated that because the valve's spring and coil forces are small relative to the system pressure, "the ability to stroke (without specification of a limiting value of stroke times) represents acceptable valve degradation and operation." It appears, based upon the Baseline Data provided in the relief request, that the valve's stroke time is not greatly influenced by system pressure. The valve has stroked in 1.4 seconds when manually stroked with the solenoid actuator (as proposed for the cold shutdown tests) and in 1.3 and 1.93 seconds at 200 psia nitrogen and 330 psia saturated water. There is insufficient justification for not specifying a maximum limiting stroke time and upon exceeding this limit, declaring the valve inoperable and taking corrective action as required by Section XI during cold shutdown testing. Therefore, it is recommended that relief be denied. The licensee should perform stroke time measurements in accordance with the Code. The valves may be tested at cold shutdowns as allowed by Section XI, paragraph IWV-3412.

Additionally, these valves are designed to fail closed in accordance with the FSAR, Section 7.4.2.1.2. The licensee has not specified a fail-safe test in Attachment 5, as required by Section XI, paragraph IWV-3415.

3.5 Auxiliary Feedwater System

3.5.1 Auxiliary Feedwater Check Valves, Valve Relief Request 18

3.5.1.1 *Relief Request:* The licensee has requested relief from the quarterly closure verification for the auxiliary feedwater check valves, CK-FW703, 704, 728, and 729, as required by ASME Section XI, paragraphs IWV-3521 and 3522.

3.5.1.2 *Proposed Alternate Testing:* The licensee has proposed a valve disassembly and inspection program to verify closure capability.

3.5.1.3 *Licensee's Basis for Relief:* To verify closing of the above check valves requires reverse flow testing (with the other auxiliary feedwater pump) and quantifying the leakage past the valves. This test is impractical to perform and places constraints on normal plant operations due to the large volume of auxiliary feedwater that would be required to be drained between the check valve and upstream isolation valve prior to testing. Additionally, by isolating the upstream motor operated valve, the plant is placed in an LCO per Technical Specification 3.5.1.

3.5.1.4 *Evaluation:* These four 4-inch check valves are normally closed and perform a safety function in both the open and closed positions. The valves open upon initiation of auxiliary feedwater flow and close during normal feedwater flow to prevent flow from being diverted away from the steam generators. The licensee states in Attachment 5 that the valves will be full-flow tested quarterly. This relief request only addresses back flow testing. The licensee should revise this relief request to address testing in the open direction.

The licensee states that leak testing is impractical to perform due to the large volume of water that would be required to be drained and that the testing would place the plant in a LCO. Entering a Technical Specification limiting condition of operation (LCO) is, by itself, not sufficient reason not to perform the Code required tests. If the length of time required to perform the testing is less than the allowable outage time of the Technical Specification action statement, the testing should be performed. If the testing removes a train or system from service and places the plant in a condition such that the design basis function cannot be met, the testing may be postponed to cold shutdowns. Testing the valves during cold shutdowns or refueling outages does not appear to be impractical. This testing may result in a hardship or unusual difficulty, however, the licensee has not provided sufficient justification of the hardship or burden (e.g., manhours required to drain the piping or radiation exposure). However, immediate imposition of the code requirements would result in a hardship to the licensee because the licensee would be required to perform tests with procedures and methods not fully developed, which could result in the values being unnecessarily declared inoperable. An interim period is necessary for the licensee to investigate alternate testing methods and develop procedures.

In accordance with ASME Section XI, closure verification may be accomplished by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate system pressure indication, by leak testing, or by other positive means. Quantification is therefore not required, as stated by the licensee in the relief request Basis. If reverse flow testing is not possible, and other positive means such as acoustic monitoring or radiography are not available, valve disassembly, and inspection may be used to verify valve closure upon cessation or reversal of flow. If the disassembly is extensive, a post reassembly test would be required by IWV-3200. The licensee should investigate the use of non-intrusive testing techniques (e.g. using a pressure instrument installed on the vent or drain lines) and should implement them if they can provide information on closure capability, valve degradation, and incipient failure. Infrequent valve disassembly and inspection provides information on the overall valve condition, while reverse flow testing and non-intrusive testing provides an assessment of continued operational readiness. For an interim period, disassembly and inspection would provide an acceptable alternative.

Based on the determination that the licensee's proposed disassembly and inspection provides reasonable assurance of operational readiness in the interim, and considering the hardship of immediately imposing the Code requirements which would require testing the valves with procedures that have not yet been prepared, it is recommended that interim relief be granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a(a)(3)(ii). In the interim, the licensee should evaluate testing the valves at cold shutdowns and with non-intrusive methods. The licensee should also provide additional justification of the burden of complying with the Code in the relief request.

3.5.2 Auxiliary Feedwater Flow Control Valves, Valve Relief Request 25

3.5.2.1 *Relief Request:* The licensee has requested relief from both measuring stroke times quarterly in accordance with ASME Section XI, paragraphs IWV-3411, 3412, and 3413 and verifying valve position indicators in accordance with IWV-3300 for the Auxiliary Feedwater Flow Control Valves, CV- 0727, 0736A, 0737A, and 0749.

3.5.2.2 *Proposed Alternate Testing:* In lieu of the above specified requirements, the licensee proposes to demonstrate the valves regulating capability quarterly in accordance with Palisades Technical Specification Surveillance Procedure QO-21, "Auxiliary Feedwater System Valves, Inservice Test Procedure."

3.5.2.3 *Licensee's Basis for Relief:* "The subject valves are required to regulate feedwater flow to the steam generators. They are not required to go to the full open or closed position for Plant safety. Because of this, stroke time testing is not an appropriate indicator of valve performance."

3.5.2.4 *Evaluation:* These four flow control valves regulate the auxiliary feedwater flow to the steam generators. They are 4-inch, normally closed air operated valves, which serve a safety function in both the open and closed positions. The licensee has requested relief from the valve full-stroke exercise test including stroke timing, and the remote position indicator verification test of the valve, as required by ASME Section XI, paragraphs IWV-3300 and 3410. In lieu of performing these tests, the licensee has proposed performing a Tech Spec Surveillance procedure which ensures that each of the valves, and associated flow control circuitry, are capable of supplying a flow of 165 gpm, plus tolerance, to each steam generator.

The safety related auxiliary feedwater system is designed to provide feedwater to the steam generators during start-up operations and to remove primary system sensible and decay heat during initial stages of shutdown operations. The AFW system also supplies water to the secondary side of the steam generators when normal feedwater sources are unavailable. These four, pneumatically controlled flow control valves are used to maintain steam generator level. The operation of these valves is essential for the system to meet its design objectives.

As discussed in Generic Letter 89-04, Position 5, the intent of the ASME Code with respect to measuring full-stroke times of power-operated valves is to verify operability and to detect valve degradation. For air-operated valves, measurement of the full stroke times accomplishes this. ASME Section XI, paragraph IWV-3413 requires the licensee to define a limiting full stroke time for all power-operated valves. The purpose of this requirement is to establish a value for taking corrective action on a degraded valve before the valve reaches the point where there is a high probability of failure. The licensee's proposal, however, does not provide detection of valve degradation. Some method should be developed to detect and monitor the valves condition.

It appears that instrumentation and procedures are in place which could be used to meet the ASME requirements. Section 9.7.5 of the FSAR states that these valves are exercised periodically during plant operation to ensure proper functioning. Operability is verified by simulating an AFW pump start signal and observing valve actuation to its correct position or by monitoring AFW flow.

The immediate implementation of the Code requirements would be a hardship to the licensee as it could result in the licensee using test procedures which have not been fully developed, which may result in these valves being declared inoperable and the system placed out of service. An interim period is necessary to allow the licensee time to develop the procedures and tests necessary to comply with the Code requirements. It is recommended that an interim period of one year, or until the next refueling outage, whichever is later, be granted in accordance with 10CFR50.55a(a)(3)(ii). The proposed alternate testing of quarterly verifying sufficient flow to the steam generators will provide adequate assurance of the operability of these valves for this interim period. During the interim period, the licensee should develop a method of monitoring the valves for degradation.

3.6 Chemical and Volume Control System

3.6.1 Charging Line Check Valve, Valve Relief Request 20

3.6.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the charging line check valve (CK-CVC2116) open quarterly as required by ASME Section XI, paragraphs IWV-3521 and 3522.

3.6.1.2 *Proposed Alternate Testing:* The licensee has proposed a disassembly and inspection plan in lieu of full flow testing the valve. The inspection will be performed during refueling outages.

3.6.1.3 *Licensee's Basis for Relief:* "To full-flow test CK-CVC2116 requires isolating the other charging line (loop 1A) and quantifying the flow past the valve.

To accomplish this test path requires isolating the manual valve (MV-2198) on the other charging line. This test is impractical to perform since a containment entry would be required into a high radiation area to isolate the valve.

This valve is full-stroke exercised during reactor refueling outages."

3.6.1.4 *Evaluation:* Check valve CK-CVC2116 is a 2-inch, self-actuating, normally open check valve located in loop 2A charging line. It provides a safety function in the open position by providing a flow path from the charging pump header to the Primary Coolant System, and in the closed position by preventing backflow to the charging pumps. Pursuant to ASME Section XI, paragraphs IWV-3521 and 3522, this valve is required to be exercised to both positions quarterly. If this is not possible, then partial stroking quarterly, and full

stroke testing during cold shutdowns is required. The licensee has stated that in order to pass full flow, isolating the manual valve (MV-2198) located on the other charging loop is required. To accomplish this will result in personnel exposure since a containment entry is necessary. In lieu of this, the licensee has proposed a disassembly and inspection plan which would be performed during refueling outages. The valve will be manually full stroked during the disassembly.

Generic Letter 89-04, Position 1, states that a check valve's ability to full stroke to the open position may be verified by passing and quantifying the maximum required accident flow through the valve. If a full flow test is impractical, alternate methods are permissible, including a disassembly and inspection, as described in Position 2.

Although full-stroke testing the valve open during operation is impractical due to the required containment entry and personnel exposure, the licensee has not provided justification for not full-stroke exercising the valve with flow during cold shutdowns or refueling outages, or partial-stroke exercising the valve quarterly.

Additionally, the licensee has referenced this relief request in Attachment 5 for testing the valve in the closed direction. The relief request Basis, Test Requirement, and Alternative Testing sections, however, do not address this test requirement. Verification that a Category C valve is in the closed position may be done by visual observation, an electrical signal initiated by a position indicating device, by observation of appropriate system pressure indications, by leak testing, or by other positive means. As described in the Revision to the Minutes of the Generic Letter 89-04, disassembly may also be used to demonstrate valve closure if no other practical means are available. Based on a review of P&ID M-202-1B, however, there currently appears to be no positive means to demonstrate valve closure (i.e., there are no test connections or instrumentation installed). The licensee should revise this relief request to address closure verification and resubmit it.

Based upon the acceptability of the licensees proposed disassembly and inspection plan in lieu of full flow testing, it is recommended that interim relief be granted for one year, or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a(g)(6)(i), provided the provisions of the disassembly and inspection plan as specified in Generic Letter 89-04, including partial flow testing, and valve disassembly and full stroke exercising each refueling are satisfied. In the interim period, the licensee should evaluate full-flow testing at cold shutdowns or refueling outages. The licensee is also encouraged to investigate and develop non-intrusive inspection methods capable of detecting valve disc position.

3.6.2 Pressurizer Auxiliary Spray Check Valve, Valve Relief Request 21

3.6.2.1 *Relief Request:* The licensee has requested relief from the quarterly full-stroke exercising requirements for the CVCS check valve CK-CVC2118, as required by ASME Section XI, paragraphs IWV-3521 and 3522.

3.6.2.2 *Proposed Alternate Testing:* In lieu of the ASME requirements, the licensee has proposed a valve disassembly and inspection program, which will be done at refueling outages, to demonstrate the valves ability to meet its safety function in the open and closed positions.

3.6.2.3 *Licensee's Basis for Relief:* "To verify full-stroke operability requires isolating the charging flow to loop 1A and 1B and quantifying the flow past the valve.

This test is impractical to perform since isolating the charging flow to the Primary Coolant System is not possible per Technical Specifications 3.2.2, and no other direct method of full flow verification exists. The valve is full stroke exercised during reactor refueling outages."

3.6.2.4 *Evaluation:* Valve CK-CVC2118 is a 2-inch, normally closed pressurizer auxiliary spray check valve, which provides safety functions in both the open and closed positions. When open, it provides a flow path from the charging line to the pressurizer, and when closed, prevents backflow to the charging line. As specified by ASME Section XI, paragraphs IWV-3521 and 3522, valves which provide a safety function in both the open and closed positions, are required to be tested quarterly. If such tests are not practical, the valves should be partial stroke tested quarterly, and full stroked during cold shutdowns. Generic Letter 89-04, Position 1, states that a check valve's full-stroke to the open position should be verified by passing the full accident flow. The licensee has requested relief from exercising the valve to the full open position since it is not possible to isolate the charging flow to the Primary System by plant Technical Specifications, and no other direct method of full-flow verification exists. Plant Technical Specification 3.2.2 specifically addresses the status of the CVCS prior to attaining criticality. It does not specifically address cold shutdowns or refueling outages. The licensee should investigate whether flow testing of this valve is possible during these plant conditions. If such a test is not practical, alternate methods, such as disassembly and inspection as specified by Generic Letter 89-04, Position 2, are permissible. The licensee has proposed a disassembly and inspection, including a manual full-stroke exercise, during refueling outages. The licensee should ensure that if possible, partial valve stroking quarterly or during cold shutdowns, or after reassembly, is also performed.

Attachment 5 also references this relief request for testing the valve in the closed direction. The relief request Basis, Test Requirement, and Alternative Testing sections only address full-flow testing. If relief is also required for testing the valve in the closed position, the request should be revised and resubmitted. Additionally, the NRC staff's position is that valve disassembly and inspection may be used for demonstrating the valves closure ability, provided there is no other possible means of verification. The licensee should also investigate the possibility of other non-intrusive methods of verifying valve disc position, and implement them if demonstrated to be effective to assess closure capability, degradation, and incipient failure.

Based upon the impracticality of performing a full-flow exercise quarterly, and the acceptability of the licensees proposed disassembly and inspection plan in lieu of full flow testing, it is recommended that relief be granted in accordance with Generic Letter 89-04, provided the provisions of the disassembly and inspection plan as specified in Position 2 of the Generic Letter, are met, including performing partial flow testing, and valve disassembly and full stroke exercising each refueling.

3.7 Condensate Demineralizer System

3.7.1 Condensate Storage Tank Check Valve, Valve Relief Request 24

3.7.1.1 *Relief Request:* The licensee has requested relief from the requirements of ASME Section XI, paragraphs IWV-3521 and 3522, which require quarterly exercising check valve CK-CD407 to the closed position quarterly.

3.7.1.2 *Proposed Alternate Testing:* In lieu of the above requirements, the licensee proposes to disassemble and inspect the valve internals during refueling outages. At each disassembly, the valves will be manually exercised to verify full stroke capability. Also, the disassembled valve is inspected to ensure the internals are structurally sound (no loose or corroded parts).

3.7.1.3 *Licensee's Basis for Relief:* "To full stroke exercise this valve to the close position requires quantitatively verifying flow in the reverse direction when the valve is seated. This test is not possible during any mode of operation since no direct or indirect method of quantitative reverse flow verification exists."

3.7.1.4 *Evaluation:* Check Valve CK-CD407 is a 3-inch, normally open, Class 3 valve. This check valve prevents the inadvertent draining of the condensate storage tank T-2 in the event of a failure of the upstream, non-safety class piping. As described in Attachment 5 to the relief request submittal, this valve performs a safety function in the closed position.

As required by ASME Section XI, paragraphs IWV-3521 and 3522, check valves which serve a safety function in the closed position are to be tested in a manner which demonstrates that the valve disc travels promptly to the seat upon flow reversal or cessation, quarterly. Confirmation that the disc is seated shall be by visual observation, by electrical signal initiated by a position indicating device, by observation of appropriate system pressure indications, by leak testing, or by other positive means, such as acoustic monitoring or radiography. It is the NRC staff's position that when no other means of verification are possible, valve disassembly is permitted. However, disassembly will provide only limited information on the valves ability to seat promptly upon flow reversal. If extensive disassembly is required, a post-reassembly test as per IWV-3200 is required. It is recommended that the licensee investigate the use of non- intrusive testing techniques and leak testing and implement them if they are demonstrated to be effective. It appears, based upon a review of P&ID's M-220 and 215, that a leak test may be performed utilizing the

drain valve downstream of CV1505. Infrequent valve disassembly and inspection are appropriate to assess the overall check valve condition, while reverse flow testing and non-intrusive testing provide an assessment of continued operational readiness.

If the Code requirements were immediately imposed, the licensee would be required to perform testing with procedures that have not yet been developed or evaluated which would be a hardship to the licensee. The NRC staff has determined that disassembly and inspection is an acceptable means of verification in Generic Letter 89-04 and will provide reasonable assurance of operational readiness in the interim period necessary for the licensee to develop procedures and test methods. It is therefore recommended that interim relief be granted in accordance with 10CFR50.55a(a)(3) (ii), provided the program meets all the provisions defined by Generic Letter 89-04, Position 2, for one year, or until the next refueling outage, whichever is later. In the interim, the licensee should investigate leak testing or other positive means for verifying valve closure.

3.8 Generic Relief Requests

3.8.1 All Valves, Valve Relief Request 22

3.8.1.1 *Relief Request:* The licensee has requested relief from ASME Section XI, paragraphs IWV-3417(b) and 3523, which specify that if, as a result of testing, corrective action is required, a valve be declared inoperable if the condition cannot be corrected within a 24-hour period. In the event of testing during cold shutdown, the condition shall be corrected prior to start-up.

3.8.1.2 *Proposed Alternate Testing:* The licensee proposes that in lieu of the above requirements, the ability to declare a component or system inoperable, and conduct plant start-up, be governed by the Palisades Nuclear Plant Technical Specifications.

3.8.1.3 *Licensee's Basis for Relief:* "The Palisades Nuclear Plant Technical Specification limiting conditions for operations, and ASME Section XI, provide the controls by which valves and systems are declared inoperative. Palisades Technical Specifications also control entry into various operational conditions, which is generally more restrictive than the ASME Code, Section XI. Failure to meet Section XI testing criteria should not, therefore, preclude plant start-up with that particular component inoperative, nor should the declaration of component or system inoperability be extended to 24 hours. Plant safety is assured by adherence to Palisades Nuclear Plant Technical Specifications."

3.8.1.4 *Evaluation:* The NRC staff has recognized the potential conflict which may exist between the time allowed for corrective action by the ASME Code, Section XI and specific plant Technical Specifications. Generic Letter 89-04, Position 8 states that as soon as a valve exceeds the limiting value for full stroke time, the component must be declared inoperable, and the TS Action time must be started. This subject was further discussed in

the responses to Questions 42-44 contained in the Minutes Of The Public Meetings On Generic Letter 89-04. Because declaring the valves inoperable as soon as the valve exceeds the limiting value for stroke time, or fails to exhibit the required change of check valve disc position, exceeds the Code requirements, relief is not required.

Plant Technical Specifications establish system operability requirements for plant startup and operation, but do not necessarily address all of the valves which perform safety functions. For those valves in flow paths which are specifically addressed by plant Technical Specifications, the licensee should have the option of delaying repairs provided startup is permitted by the Technical Specifications. However, general relief, as requested by the licensee, cannot be granted for valves in flowpaths not specifically addressed by Technical Specifications. If relief is requested for these valves, the licensee should submit specific relief requests which provide the basis to justify the request in terms of the safety function. The licensee should also include a plan which addresses the repair and retesting for the valves.

Valves which are tested either during cold shutdowns or refueling outages are tested at that frequency because of specific concerns which make quarterly testing during power operation impractical, as demonstrated through the submittal of relief requests or cold shutdown justifications. Should the plant restart with cold shutdown frequency valves out of service, the valves must be repaired and retested per the requirements of ASME Section XI, paragraphs IWV-3417(b) and 3523 prior to entering any operating mode which requires the valve to be in service. Since testing during power operation is impractical for these valves, it may be necessary to shutdown the plant in order to retest these valves.

Based upon the burden of requiring the licensee to delay plant startup in order to repair a valve in a flow path addressed by plant Technical Specifications which is not required to be operable for plant start up and operation by the Technical Specifications, it is recommended that this relief request be granted approval in accordance with 10CFR50.5-5a(g)(6)(i). However, the requested relief is not approved for those valves which are in flowpaths not specifically addressed by Technical Specifications. Specific relief must be requested for these valves. If the repair of any valve is deferred in order to allow plant start up, a retest of that valve demonstrating acceptable operation shall be made before the valve is returned to service. This testing should be performed prior to entering any operating mode which requires the valve to be in service, even if the plant must be shutdown in order to perform the testing.

3.8.2 All Category A and B Valves, Valve Relief Request 23

3.8.2.1 *Relief Request:* The licensee has requested relief from the valve test frequency requirements for valve exercising and leak rate tests as specified by ASME Section XI, paragraphs IWV-3411 and 3422 for all Category A and B valves.

3.8.2.2 *Proposed Alternate Testing:* In lieu of the above requirements, the licensee proposes to allow an extension of the specified surveillance intervals in accordance with the Technical Specifications. Each surveillance requirement shall be performed within the specified time interval with:

a. A maximum allowable extension not to exceed 25% of the surveillance interval, and

b. A total maximum allowable combined interval time for any three consecutive surveillance intervals not to exceed 3.25 times the specified surveillance interval.

3.8.2.3 *Licensee's Basis for Relief:* "Specification 4.0.2 establishes the conditions under which the specified time interval for Surveillance Requirements may be extended. Item a. permits an allowable extension of the normal surveillance interval to facilitate surveillance scheduling and consideration of plant operating conditions that may not be suitable for conducting the surveillance; e.g., transient conditions or other ongoing surveillance or maintenance activities. Item b. limits the use of the provisions of Item a. to ensure that it is not used repeatedly to extend the surveillance interval beyond that specified. The limits of Specification 4.0.2 are based on engineering judgement and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with Surveillance Requirements. These provisions are sufficient to ensure that the reliability ensured through surveillance activities is not significantly degraded beyond that obtained from the specified surveillance interval."

3.8.2.4 *Evaluation:* In accordance with the requirements of ASME Section XI, paragraphs IWV-3411 and 3422, all Category A and B valves are required to be exercised to their safety position quarterly, and Category A valves leak tested every 2 years. The Code allows valves to be exercised during cold shutdowns in certain instances. The ASME Code, Section XI does not however provide for any extensions of the surveillance intervals. The licensee proposes to implement the provisions of Technical Specification 4.0.2, which permits the extension of surveillance intervals.

Plant Technical Specification 4.0.5, which requires Class 1, 2, and 3 pumps and valves to be tested in accordance with ASME Section XI, explicitly states that the provisions of Specification 4.0.2 are applicable to the required frequencies for performing inservice testing activities. Additionally, failure to perform a surveillance requirement within the allowed surveillance interval, defined by Specification 4.0.2, shall constitute non-compliance with the operability requirements for a Limiting Condition of Operation (Specification 4.0.3).

Extending these intervals as allowed by the Technical Specifications will not compromise the integrity of the systems or components and provides an acceptable level of quality and safety. Given that the plant is in a transient condition, or other components or systems are undergoing surveillance or maintenance activities, an extension may prevent a

required shutdown due to a limiting condition of operation and decrease plant risk. It is recommended that relief be granted, as requested, in accordance with 10CFR50.55a(a)(3)(i).

4.0 COLD SHUTDOWN JUSTIFICATIONS

As part of the inservice test program update, Consumers Power has proposed that specific valves in the Palisades Nuclear Plant can only be tested during cold shutdown instead of quarterly, as required by ASME Section XI. The basis for these alternative test frequencies include impracticality due to equipment and operational limitations, potential equipment damage, reduction in safety, or disruption of reactor operation. A total of twenty-eight separate justifications were submitted. Each justification was reviewed to verify its technical basis. Concerns with a number of the justifications is provided below. The remainder of the cold shutdown justifications were found to be acceptable.

4.1 Cold Shutdown Testing Basis Numbers 4 and 5 discuss the impracticality of disrupting charging/letdown flows. Valve CV2001 (P&ID M-202-1B) however is tested quarterly. The licensee should review the valve's test procedure and the Cold Shutdown Testing Basis. In addition to the potential of thermally shocking the regenerative heat exchanger, there is also the potential for pressurizer level transients due to the disrupted flow.

4.2 The licensee defines the function of the valves addressed in Cold Shutdown Testing Basis Number 6 to include closing to maintain the Boric Acid Tank levels. Attachment 5 of the IST Program only specifies an open safety position. If the valves have a safety function in both the open and closed position, they are required to be stroke-exercised in both directions.

4.3 In the Basis for Cold Shutdown Testing Basis Number 7, the licensee states that full-flow testing can only be performed during cold shutdowns with the LPSI pumps, and that partial-stroke exercising is not practical during normal plant operation because of potential damage as documented in Relief Request 17. Attachment 5 of the IST Program states that the valves will be partial-stroke and full-stroke exercised at cold shutdowns. The Alternative Testing Section however states that the valves will be partial-stroke exercised quarterly and full-stroke exercised during refueling outages. Additionally, the reference to Relief Request 17 appears to be in error. The licensee should revise and resubmit this Cold Shutdown Testing Basis. If the valves can only be tested at refueling outage, a relief request is required.

4.4 The licensee discusses in Cold Shutdown Testing Basis Number 11 why the LPSI Pump discharge valves cannot be full- or partial-stroke exercised during operation by injecting into the PCS. The licensee should also discuss why the 1" shutdown cooling crossover or 6" containment spray recirculation to SIRW lines cannot be used to partial-stroke the valves quarterly.

4.5 Entering a Technical Specification limiting condition of operation (LCO) is, by itself, not sufficient reason not to perform the Code required tests. If the length of time required to perform the testing is less than the allowable outage time (AOT) of the Technical Specification action statement, the testing should be performed. If the testing removes a train or system from service and places the plant in a condition such that the design basis function cannot be met, the testing may be postponed to cold shutdowns. Cold Shutdown Testing Basis Numbers 12, 12A, 13, 14, 20, and 21 should be reviewed based on the above discussion.

4.6 Cold Shutdown Testing Basis Number 12 states that "a successful flush of check valves CK-3404, CK-3405, CK-3406 and CK-3407 constitutes an acceptable full-stroke test." As documented in Generic Letter 89-04, Position 1, the NRC Staff considers the verification that a check valve can pass the maximum required accident condition flow as an acceptable full-stroke test. The licensee should verify that the valve can be tested in accordance with the Generic Letter. Otherwise, a relief request should be submitted.

4.7 Cold Shutdown Testing Basis Number 22 is not required. Relief Request 15 addresses testing the PORVs at cold shutdowns without evaluating the stroke times against a limiting value.

5.0 IST PROGRAM ACTION ITEMS

ASME Section XI inconsistencies, omissions, and required licensee actions identified during the review of the licensee's inservice testing program are summarized below. The licensee should resolve these items in accordance with the evaluations presented in this report.

5.1 Inservice Testing of Plant Valves, Procedure EM-09-02, Section 5.2.4 states that Category A valves will be tested as follows: "1. Category A valves which are part of containment isolation shall be tested in accordance with Federal Regulation 10CFR50, Appendix J, per Relief Request 11. 2. Event V pressure isolation valves shall be leak tested in accordance with the requirements of Technical Specifications Table 4.3.1 and IWV-3420. 3. Leakage tests shall be conducted at least once every two years and shall be performed in accordance with IWV-3423, IWV-3425. 4. Valves which function in the course of other Plant Operations or other testing of the same interval in a manner which demonstrates functionally adequate leak tightness need not be additionally tested. However, documentation for each valve showing the requirements of IWV are met shall be contained in Attachment 1."

The IST Valve Table, Attachment 5, only identifies one type of leakage test, "AT," which is described as the 10CFR50, Appendix J leakage test for containment isolation valves. Generic Letter 89-04, Position 4, states that all pressure isolation valves listed in the plant Technical Specifications should be listed in the IST Program

as Category A or A/C and that the Technical Specification requirements should be referenced. All the PIVs are listed in the IST Program; however, only the "AT" test is referenced.

Additionally, Position 10 of Generic Letter 89-04 states that the licensee must comply with ASME Section XI, paragraphs IWV-3426 and 3427(a) in addition to Appendix J for containment isolation valve testing. It is not clear from reading the IST Program, Section 5.2.4 and Relief Request 11, if Section XI, paragraphs IWV-3426 and 3427(a) will be applied. Subparagraph 3 of Section 5.2.4 states that leakage tests will be performed in accordance with Section XI, paragraphs IWV-3423 and 3425. Paragraphs IWV-3425 (Test Medium), IWV-3426 (Analysis of Leakage Rates) and IWV-3427 (Corrective Actions) are specifically omitted.

5.2 The valve IST procedure EM-09-02, Section 5.3.1 discusses reference and limiting valve stroke times. It states that the reference stroke time shall be the expected stroke time based on past historical operating data and that the limiting stroke time shall be 1.75 times the reference value for valves with reference stroke times less than or equal to 10 seconds and 1.50 times the reference value for valves with reference stroke times greater than 10 seconds. Position 5 of Generic Letter 89-04 establishes guidelines regarding limiting stroke times. The limiting value should be based on the reference or average stroke time when the valve is known to be in good condition and is operating properly. Additionally, the Technical Specification or safety analysis limit should be used as the limiting value, when this value is less than the value calculated based on a reference value.

5.3 ASME Section XI, paragraph IWV-3512 requires safety and relief valves to be tested in accordance with ASME PTC 25.3. The valve IST procedure, EM-09-02, Section 5.2.2.b, states that ASME PTC 25.3 shall not be used for administrative purposes and that the Palisades administrative procedures shall govern items such as personnel and equipment qualifications, procedure formats, and test conducts. The licensee should prepare a relief request if the Code requirements cannot be met.

5.4 Note 2 of Table 3 in the pump IST procedure EM-09-04 states that the service water pumps inlet pressure will be calculated from the level of water in the sump pit. ASME Section XI, paragraph IWP-3100 requires inlet and differential pressures to be measured. In the absence of installed pressure instrumentation, calculating inlet pressures based on levels is acceptable, provided the calculation is properly proceduralized and that it is within the accuracy that would result from instruments meeting the Code accuracy requirements. A relief request, however, should be prepared if the Code requirements cannot be met.

5.5 Relief has been granted from measuring the LPSI and Containment Spray pumps bearing temperature (Pump Relief Requests 2 and 3) provided the licensee reviews the periodic oil sample and signature analysis program to ensure that the frequency

is adequate to detect degradation in a timely manner (TER Section 2.1). Additionally, the relief request concerning the containment spray pumps is identified on pages 4 and 5 of EM-09-04, Attachment 5, as Relief Request 2. It appears based on Table 3 of Attachment 3, that the Relief Request number is 3.

5.6 The NRC Staff encourages the use of pump vibration velocity measurements, such as the program contained in ASME Operation and Maintenance Standard, Part 6. However, in Pump Relief Request 4, the licensee has provided insufficient information to evaluate the request. The licensee is encouraged to revise and resubmit the request or adopt Code Case N-465 (TER Section 2.2).

5.7 In Valve Relief Request 2, the licensee has proposed either full-stroke exercising the safety injection tank check valves or disassembling and inspecting the valves at refueling outages. The licensee should perform full-flow tests unless this testing is impractical. If the full-flow tests are impractical, the licensee should prepare a justification. Also, the licensee should full-stroke test the valves at cold shutdowns and partial-stroke test the valves quarterly, or provide justification (TER Section 3.1.2). The relief request incorrectly identifies valve CK-ES3102 as CK-3102.

5.8 The IST Program - Valve Test Table (Attachment 5) identifies only an open safety position for the containment spray header check valves (CK-ES3216 and 3226). Valve Relief Request 3 discusses a function in the closed direction to "prevent backflow from Containment Spray Header" for these valves. Relief has only been approved for full-stroke exercising the valve open quarterly. The licensee should review the safety function of these valves and revise the relief request and/or IST Program Table as appropriate.

5.9 Interim relief has been recommended for Valve Relief Request 4. In the interim, the licensee should evaluate partial-stroke testing the HPSI pressure isolation valves quarterly (TER Section 3.1.3).

5.10 Attachment 5 of the relief request submittal indicates that relief is being sought from the Code requirements for demonstrating the acceptability of the Redundant HPSI check valves in both the open and closed directions. The actual text of Valve Relief Request 5 only describes testing in the open direction and relief has been recommended in the open direction only. The licensee should review the text of the Relief Request, and revise and resubmit as necessary, if relief is being sought from the requirements in both the open and closed positions. The licensee should also evaluate partial-stroke exercising the valves quarterly and the Code category (TER Section 3.1.4).

5.11 The Baseline Data section of Valve Relief Request 6 states that the initial disassembly and inspection is "tentatively scheduled for the 93 Refout (CK-ES3181) and 94 Refout (CK-E53166)" and that "this schedule is based on the priority achieved

by applying EPRI NP-5479, 'Application Guideline for Check Valves in Nuclear Plants'." Relief is granted provided all the criteria in Generic Letter 89-04, Attachment 1, Position 2 are met including disassembly and inspecting one valve in each group each refueling outage. The licensee should provide an implementation schedule since it appears the disassembly and inspection program is not currently in effect.

5.12 In Valve Relief Request 6, the licensee proposes disassembly and inspection as an alternate to full-stroke exercising. In Attachment 5, this relief request is referenced for both the open and closed test direction. The Relief Request Test Requirement, Basis for Relief, and Alternative Testing Sections, do not, however, discuss the closed test direction. Therefore, relief is only granted from full-stroke exercising the valve open is in accordance with Generic Letter 89-04, Position 2. ASME Section XI and Generic Letter 89-04, Attachment 1, Position 3, allows verification of a valve in the closed direction to be done by visual observation, by an electrical signal initiated by a position-indicating device, by observation of appropriate pressure indication in the system, by leak testing, or by other positive means. It is the opinion of the NRC Staff that disassembly can be used for verifying valve closure when no other means of verification is possible. Disassembly provides limited information on the valve's capability to seat promptly on cessation or reversal of flow. The licensee should investigate the use of leak testing quarterly or during cold shutdowns to determine valve closure, as this appears to be feasible. Therefore, relief from verifying the valve is in the closed position quarterly cannot be recommended.

5.13 Attachment 5 of the relief request submittal indicates that relief is being sought from the Code requirements for demonstrating the acceptability of the SIRW tank check valves in both the open and closed directions, and for leak testing. The actual text of Valve Relief Request 7 only describes testing in the open direction. The licensee should review the text of the Relief Request, and revise and resubmit as necessary, if relief is being sought from the requirements in both the open and closed positions, and for leak testing. This TER only addresses the request for relief from full-stroke exercising the valve open.

Additionally, the licensee has proposed disassembling and inspecting the valves when there is a full-core off-load and when fuel pool cooling loads are low. The licensee has not provided sufficient justification in the relief request for not disassembling and inspecting one valve every refueling outage in accordance with Generic Letter 89-04, Position 2. Therefore, relief is granted in accordance with the Generic Letter provided the licensee meets all the criteria in Position 2 of the relief request including those required to justify extending the disassembly and inspection interval. (TER Section 3.1.5).

5.14 Interim relief has been granted for the HPSI pumps' discharge check valves (Valve Relief Request 8). In the interim, the licensee should evaluate alternate methods to verify the valves' capability to close (TER Section 3.1.6).

5.15 Valve Relief Request 9 states that the containment spray pumps' discharge check valves; CK-3208, 3230, and ES3220; are partial-stroke exercised quarterly (in the Alternate Testing and Qualification Program sections). The Valve Test Table (Attachment 5) however, specifies the partial-stroke and closure test at a cold shutdown frequency. The relief request is approved assuming that a partial-stroke test and verification of the valve in the closed position is performed quarterly. If the testing is performed at cold shutdowns, a cold shutdown justification should be prepared and the relief request revised.

Additionally, in the IST Valve Table, Valve CK-ES3230 is disassembled/inspected on a refueling outage frequency. The other two valves are inspected using a sampling plan. Relief is granted provided that one valve in each valve group is inspected each refueling outage and each valve is inspected at least once every six years. The three subject valves are identified differently in the relief request, P&ID M-204 sheets 1 and 1A, and the Valve Test Table (e.g., the relief request and P&ID identify CK-3208, while the Table identifies CK-ES3208).

5.16 The Relief Request Index identifies Valve Relief Request 10 as pertaining to emergency diesel generator check valves. As defined by Attachment 5, Valve Test Table, Service Water P&ID 208-1A, and Relief Request No. 10, valves CV-0884 and 0885 are air operated butterfly valves, not check valves. Additionally, interim relief has been recommended with provisions for these valves. In the interim, the licensee should utilize the time to achieve design flowrates as an indicator of valve operational readiness in addition to the methods proposed and evaluate other means of measuring stroke times (TER Section 3.2.1).

5.17 Valve Relief Request 11 requests relief from the increased testing frequencies for six-inch and larger valves specified by ASME Section XI, paragraph IWV-3427(b). A review of Attachment 5 for P&ID's M-211-2 and 222-2 indicate that this relief request is referenced for valves smaller that six inches. The licensee should ensure the relief request is applied to the appropriate valves.

5.18 Based on the lack of sufficient justification, it is recommended that relief be denied for the component cooling isolation valves stroke time requirements. The licensee should test these valves in accordance with the Code, or revise and resubmit the relief request. Additionally, the Basis For Relief section of Valve Relief Request 12 requests relief from the stroke timing requirements specified by ASME Section XI, paragraph IWV-3414. This is an incorrect reference. Paragraph IWV-3414 pertains to the frequency of testing for valves which are in regular use, paragraph IWV-3413

defines the stroke time testing requirements for power operated valves (TER Section 3.3.1).

5.19 The individual listings for the valves identified on Valve Relief Requests 10 and 12, provided in Attachment 5 "Inservice Test Program, Valve Test Table" implies that relief is being requested from the provisions of IWV-3415 concerning Fail Safe Valves. This is not identified in the text of the Relief Requests and has not been evaluated in this TER (TER Sections 3.2.1 and 3.3.1).

5.20 The licensee has not provided justification for not full-stroke exercising the component cooling water check valves, CK-CC401 and 402, with flow or verifying closure capability. The licensee should test these valves in accordance with the Code or revise and resubmit the relief request. Additionally, the Baseline Data section of Valve Relief Request 13 incorrectly classifies the check valves as Category B, which does not agree with the other sections of this relief request, or the Attachments. The first sentence of this section is also incomplete as submitted (TER Section 3.3.2).

5.21 Attachment 5, page 78 of 122, defines the normal position for the check valves (CK-CC401 and 402) as open. Based upon a review of P&ID M-209-2, these valves appear to be normally closed, and open upon initiation of the cooling flow to the pumps.

5.22 It is recommended that relief be denied for the pressurizer PORVs. The licensee has not provided sufficient justification in Valve Relief Request 15 for not specifying maximum limiting stroke times and performing corrective action upon exceeding these limits. The licensee should perform tests in accordance with the Code. Additionally, the licensee has not specified a fail-safe test in Attachment 5. Based on the FSAR, it appears that the valves have a fail-safe function (TER Section 3.4.1).

5.23 Valve Relief Request 17 defines the specific aspects of the valve disassembly and inspection program which is applicable to various Category C valves. The licensee has not identified the specific check valves this relief request applies to. This relief request is assumed to be used together with valve specific relief requests 2, 3, 6, 7, 8, 9, 13, 18, 19, 20, 21, 24, 26, and 27 which propose disassembly and inspection as an alternative test. Reference to this Relief Request should be made either in the text of the specific relief requests which propose a disassembly/inspection program or in Attachment 5. The criteria for a valve disassembly and inspection program is provided in Generic Letter 89-04, Position 2. This includes limits on the number of valves which may be included in one group and the inspection frequency for each valve in the group. This relief request does not provide specific information, or limits, for either the group size, inspection frequency, grouping by valve orientation, or the requirement that all the valves in a group be inspected if binding or valve internal failure is found. Position 2 also provides specific guidelines for the

frequency of inspection for each valve in a group to ensure that no more than six years will pass between inspections for any particular valve in the group. The intent of the Generic Letter is to inspect one valve in the group during each refueling outage, not every six years as inferred from the licensees definition of SAM in Attachment 5. Relief is only recommended provided the disassembly/inspection program meets all the criteria in Position 2.

5.24 Valve Relief Request 18 describes a disassembly and inspection program for auxiliary feedwater check valves CK-FW703, 704, 728, and 729. The licensee proposes to group these four check valves and to perform a sampling plan disassembly and inspection technique on these valves to verify valve operability at least once every 6 years. Generic Letter 89-04, Position 2, and Relief Request 17 provide specific requirements for grouping valves, including that each valve in a group must be the same size. Attachment 5 describes check valves CK-FW703 and 704 as 6-inch valves, and check valves CK-FW728 and 729 as 4-inch check valves. Since these valves are different sizes, they cannot be in the same group. The licensee should revise this relief request to identify the correct grouping(s) of valves. It is recommended that interim relief be granted provided the licensee complies with all of the requirements for valve disassembly and inspection as defined by Generic Letter 89-04, Position 2. In the interim, the licensee should evaluate testing the valves at cold shutdowns and with non-intrusive methods. The licensee should also provide additional justification of the burden of complying with the Code in the relief request (TER Section 3.5.1).

5.25 It is recommended that interim relief be granted for the containment air cooler service water check valves. In the interim the licensee should evaluate full-flow testing of these check valves as flow instrumentation is currently installed. Additionally, Valve Relief Request 19 refers to four service water check valves which open to provide a flow path for the service water discharge from the air coolers. Attachment 5 of the relief request submittal defines the safety position of these normally open check valves as open. The licensee should review this to ensure that these valves do not also perform a safety function in the closed position as well to prevent backflow to the coolers. If they do, then ASME Section XI, Paragraph IWV-3522 requires that they be tested to ensure operability in both positions (TER Section 3.2.2).

5.26 Valve Relief Request 20 and the IST Valve Test Table specifies check valve CK-CVC2116 as Class 2. The licensee should review the ASME Classification as it appears the valve should be Class 1. Attachment 5 of the relief request submittal indicates that relief is being sought from the Code requirements for demonstrating the acceptability of the valve in both the open and closed directions. The actual text of the Relief Request only describes testing in the open direction. The licensee should review the text of the Relief Request,and revise as necessary, to ensure it clearly states that relief is being sought from the requirements in both the open and closed positions. Additionally, interim relief with provisions is recommended,

provided that the licensee's disassembly and inspection program meets all the criteria in Generic Letter 89-04, Position 2. In the interim, the licensee should evaluate full-flow testing at cold shutdowns or refueling outages and investigate the use of non-intrusive test methods (TER Section 3.6.1).

5.27 Valve Relief Request 21 and Attachment 5 specify check valve CK-CVC2118 as Class 2. The licensee should review this classification since valve CVC2117, located upstream from CVC2118, is classified as Code Class 1. Attachment 5 of the relief request submittal indicates that relief is being sought from the Code requirements for demonstrating the acceptability of the valve in both the open and closed directions. The actual text of the Relief Request only describes the relief request in the open direction. The licensee should review the text of the Relief Request, and revise as necessary, if relief is being sought from the requirements in both the open and closed positions. Additionally, relief is granted provided all the criteria of Generic Letter 89-04, Position 2 is met and the licensee confirms that full-flow testing is impractical during cold shutdowns or refueling outages. Otherwise, the licensee should meet the Code requirements (TER Section 3.6.2).

5.28 It is recommended that generic relief from the requirements of ASME Section XI, paragraph IWV-3417(b) and 3523 be denied for valves in flowpaths addressed by the Technical Specifications (Valve Relief Request 22). The licensee may request specific relief (TER Section 3.8.1).

5.29 Interim relief has been recommended for the condensate demineralizer check valve provided that the licensee meets all the criteria contained in Generic Letter 89-04, Position 2 (Valve Relief Request 24). In the interim, the licensee should evaluate the use of leak testing or other positive means in lieu of valve disassembly and inspection (TER Section 3.7.1).

5.30 The Auxiliary Feedwater flow control valves are classified as Class 3 in Valve Relief Request No. 25. Attachment 5 to the Relief Request Submittal defines these valves as Class 2. The licensee should review the valve classification and revise the appropriate documentation. Also, the relief request is not referenced in Attachment 5 for any of the four valves discussed. The relief request's "Test Requirement" section includes valve position indicator verification in addition to the exercise and stroke-time requirements of IWV-3400. The Basis, however, does not address position indicator verification. Therefore, relief from the requirements of IWV-3300 has not been granted. Interim relief has been recommended. In the interim, the licensee should develop a method to detect and monitor the valves' condition (TER Section 3.5.2).

5.31 Relief has been recommended for full-stroke exercising the service water pumps' discharge check valves, provided that all the criteria in Generic Letter 89-04 are met. It is recommended that relief from reverse flow testing be denied. The licensee

should perform this testing in accordance with the Code requirements. Additionally, the Baseline Data and Acceptance Criteria provided in Valve Relief Request 27 refers to the check valves described in Valve Relief Request 26. This relief request should be revised, as appropriate (TER Section 3.2.3).

6.0 REFERENCES

1. ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1983 Edition including Summer 1983 Addenda.

2. "Revised Inservice Testing of Plant Valves Program and Selected Safety Related Pumps," G.B. Slade (Consumers Power) to USNRC, June 28, 1991.

3. "Confirmation of Conformance with Generic Letter 89-04 (TAC No. 74783)," K.W. Berry (Consumers Power) to USNRC, October 2, 1989.

4. Palisades FSAR, Revision 12 and Technical Specifications.

5. ASME/ANSI OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants."

6. ASME/ANSI OMa-1988, Part 10, "Inservice Testing of Valves in Light-Water Reactor Power Plants."

7. 10CFR50.55a

8. Standard Review Plan, NUREG-0800, Section 3.9.6, Inservice Testing of Pumps and Valves, Rev. 2, July 1981.

9. NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," April 3, 1989.

10. Minutes of the Public Meetings on Generic Letter 89-04, October 25, 1989 and the Supplement to the Minutes, September 26, 1991.

11. NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 8, November 1990.

12. NRC Information Notice 91-56, "Potential Radioactive Leakage to Tank Vented to Atmosphere," September 19, 1991.

Palisades Nuclear Plant - SE Table 1 - Summary of Relief Requests

Relief Request No. (IST Program Section)	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
PRR-1	---	IWP-3100, measurement of bearing temperature	P-55A,B,C, charging pumps.	Monitor lubricant level, pressure, oil samples.	Preapproved by Generic Letter 89-04.
PRR-2	2.1	IWP-3100, measurement of bearing temperature	P-67A,B, LPSI pumps.	Monitor lubricant level, perform bearing signature analysis, analyze crank case oil particulates.	Provisional relief granted in accordance with 10CFR50.55a (a)(3) (ii). See TER Section 5.5.
PRR-3	2.1	IWP-3100, measurement of bearing temperature	P-54A,B,C, containment spray pumps.	Monitor lubricant level, perform bearing signature analysis, analyze crank case oil particulates.	Provisional relief granted in accordance with 10CFR50.55a (a)(3) (ii). See TER Section 5.5.
PRR-4	2.2	IWP-4500, measurement of vibration displacement amplitudes	All pumps.	Measure vibration velocities.	Open item. See TER Section 5.6.
VRR-1	3.1.1	IWV-3521 and -3522, test frequency	CK-3410, hot leg HPSI injection check valves.	Partial-stroke exercise at cold shutdowns, full-stroke exercise valve open each refueling outage.	Relief granted in accordance with 10CFR50.551 (g)(6)(i).
VRR-2	3.1.2	IWV-3521 and -3522, test frequency	CK-3102, ES3117, -ES3132, -ES3147, SI tank check valves.	Partial-stroke exercise at hot shutdowns, full-stroke exercise valves open or disassemble/inspect one valve each refueling outage	Open item. See TER Section 5.7 and 5.23.
VRR-3	---	IWV-3521 and -3522, test frequency	CK-ES3216, -ES3226, containment spray header check valves.	Partial-stroke exercise valves open quarterly, disassemble and inspect valves.	Approved by Generic Letter 89-04, position 2. See TER Sections 5.8 and 5.23.
VRR-4	3.1.3	IWV-3521 and -3522, test frequency	CK-ES3104, -ES3119, -ES 3134, -ES3149, HPSI header pressure isolation valves.	Partial-stroke exercise valves open at cold shutdowns, full-stroke exercise at refueling outages.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (g)(6)(i). See TER Section 5.9.

Palisades Nuclear Plant - SE Table 1 - Summary of Relief Requests (Cont'd)

Relief Request No. (IST Program Section)	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VRR-5	3.1.4	IWV-3521 and -3522, test frequency	CK-ES3250, -ES3251, -ES 3252, -ES3253, redundant HPSI header check valves.	Partial-stroke exercise valves open at cold shutdowns, full-stroke exercise at refueling outages.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (g)(6)(i). See TER Section 5.10.
VRR-6	—	IWV-3521 and -3522, test frequency	CK-3166, -3181, containment sump discharge check valves.	Partial-stroke exercise at cold shutdowns and disassemble and inspect valves to verify full-stroke open capability.	Approved by Generic Letter 89-04, position 2. See TER Sections 5.11, 5.12 and 5.23.
VRR-7	3.1.5	IWV-3521 and -3522, test frequency	CK-ES3239, -ES3240, SIRW tank suction check valves.	Partial-stroke exercise quarterly and disassemble and inspect valves nominally once every 10 years to verify full-stroke open capability.	Provisional relief granted for full-stroke exercising the valves open in accordance with Generic Letter 89-04. See TER Sections 5.13 and 5.23.
VRR-8	3.1.6	IWV-3521 and -3522, test frequency	CK-3177, -3186, -ES3411, HPSI pumps discharge check valves.	Partial-stroke exercise quarterly, full-stroke exercise open at refueling outages. Verify closure capability by disassembly and inspection.	Relief granted for full-stroke exercising in accordance with 10CFR50.55a(g)(6)(i). Interim relief granted for one year or until the next refueling outage, whichever is later for closure verification, in accordance with 10CFR50.55a(g)(6)(i). See TER Section 5.14 and 5.23.
VRR-9	—	IWV-3521 and -3522, test frequency	CK-3208, -3230, ES3220, containment spray pumps discharge check valves.	Partial-stroke exercise valves quarterly and disassemble and inspect to verify full-stroke open and closure capability.	Approved by Generic Letter 89-04, position 2. See TER Sections 5.15 and 5.23.

Palisades Nuclear Plant - SE Table 1 - Summary of Relief Requests (Cont'd)

Relief Request No. (IST Program Section)	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VRR-10	3.2.1	IWV-3413, stroke time measurement.	CV-0884, -0885, service water to EDGs isolation valves.	Perform monthly EDG operability test.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (g)(6)(i). See TER Sections 5.16 and 5.19.
VRR-11	—	IWV-3427(b), corrective action.	All CIVs.	Perform Appendix J leak tests.	Approved by Generic Letter 89-04, position 10. See TER Section 5.17.
VRR-12	3.3.1	IWV-3413, stroke time measurement.	CV-0944, -0977B, component cooling rad waste evaporator isolation valves.	Perform valve testing, without stroke time measurement, during cold shutdowns.	Relief denied. See TER Sections 5.18 and 5.19.
VRR-13	3.3.2	IWV-3521, -3522, test frequency.	CK-CC401, -CC402, component cooling water check valves.	Partial-stroke exercise quarterly and disassemble and inspect valves to verify full-stroke open and closure capability.	Relief denied. See TER Sections 5.20 and 5.23.
VRR-14	—	IWV-3417(a), corrective action.	All fast-acting valves.	Assign a 2-second maximum limiting stroke time.	Approved by Generic Letter 89-04, position 6.
VRR-15	3.4.1	IWV-3413, -3417, stroke time measurement frequency.	PRV-1042B, -1043B, PORVs.	Stroke quarterly without specifying a limiting stroke time, stroke at refueling outages with a 2-second limiting stroke time.	Relief denied. See TER Section 5.22.
VRR-16	3.1.7	IWV-3521, -3522, test frequency.	CK-ES3408, -ES3409.	Partial-stroke exercise quarterly, full-stroke exercise at refueling outages.	Relief granted in accordance with 10CFR50.55a (g)(6)(i).
VRR-17	—	IWV-3521, -3522, test frequency.	All applicable check valves.	Perform disassembly and inspection.	Relief not required. See TER Section 5.23.

Palisades Nuclear Plant - SE Table 1 - Summary of Relief Requests (Cont'd)

Relief Request No. (IST Program Section)	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VRR-18	3.5.1	IWV-3521, -3522, test frequency and method.	CK-FW703, -FW704, -FW 728, -FW729, auxiliary feed-water injection check valves.	Verify valve closure by valve disassembly and inspection.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (a)(3)(ii). See TER Sections 5.23 and 5.24.
VRR-19	3.2.2	IWV-3521, -3522, test frequency.	CK-SW407, -SW408, -SW 409, -SW410, service water containment air cooler outlet check valves.	Partial-stroke valve open quarterly, perform valve disassemble and inspection to verify full-stroke open capa-bility.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (a)(3)(ii). See TER Sections 5.23 and 5.25.
VRR-20	3.6.1	IWV-3521, -3522, test frequency.	CK-CVC2116, charging line to PCS check valve.	Verify full-stroke open capa-bility by valve disassembly and inspection.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (g)(6)(i). See TER Sections 5.23 and 5.26.
VRR-21	3.6.2	IWV-3521, -3522, test frequency.	CK-CVC2118, pressurizer auxiliary spray check valve.	Verify full-stroke open capa-bility by valve disassembly and inspection.	Provisional relief granted in accordance with Generic Letter 89-04 Position 2. See TER Sections 5.23 and 5.27.
VRR-22	3.8.1	IWV-3417(b), -3523, corrective action.	All valves.	Declare system or component inoperable and conduct plant startup in accordance with the Technical Specification.	Relief granted in accordance with 10CFR50.55a (g)(6)(i) for valves in flowpaths specifically addressed in the Technical Spec-ifications. Relief denied for valves not in flowpaths specifi-cally addressed in the Technical Specifications. See TER Section 5.28.

Palisades Nuclear Plant - SE Table 1 - Summary of Relief Requests (Cont'd)

Relief Request No. (IST Program Section)	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VRR-23	3.8.2	IWV-3411, -3422, test frequency.	All category A and B valves.	Allow extensions of test intervals in accordance with Technical Specification 4.0.2.	Relief granted in accordance with 10CFR50.55a (a)(3)(i).
VRR-24	3.7.1	IWV-3521, -3522, test frequency and method.	CK-CD407, condensate storage tank check valve.	Verify valve closure capability by disassembly and inspection.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (a)(3)(ii). See TER Sections 5.23 and 5.29.
VRR-25	3.5.2	IWV-3400, stroke time measurement. IWV-3300, valve position verification.	CV-0727, -736A, -737A, -749, auxiliary feedwater flow control valves.	Verify flow regulating capability quarterly.	Interim relief granted for one year or until the next refueling outage, whichever is later, in accordance with 10CFR50.55a (a)(3)(ii). See TER Section 5.30.
VRR-26	---	IWV-3521, -3522, test frequency and method.	CK-CVC2112, -CVC2114, charging flow to PCS check valves.	Verify valve closure capability by disassembly and inspection. Perform partial stroke exercise quarterly.	Approved by Generic Letter 89-04, position 2. See TER Section 5.23.
VRR-27	3.2.3	IWV-3521, -3522, test frequency and method.	CK-SW401, -SW402, -SW 403, service water pumps discharge check valves.	Verify full-stroke open and closure capability by disassembly and inspection.	Provisional relief from full-stroke testing valve open approved by Generic Letter 89-04, position 2. Relief from reverse flow testing is denied. See TER Sections 5.23 and 5.31.