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TECHNICAL EVALUATION REPORT
PUMP AND VALVE INSERVICE TESTING PROGRAM
PILGRIM NUCLEAR POWER STATION

Docket No. 50-293

R. S. Hartley

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Idaho National Engineering Laboratory
EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

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ABSTRACT

This EG&G Idaho, Inc., report presents the results of our evaluation of relief requests for the Pilgrim Power Station, inservice testing program for safety-related pumps and valves.

PREFACE

This report is supplied as part of the "Review of Pump and Valve Inservice Testing Programs for Operating Reactors (III)" program conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Mechanical Engineering Branch, by EG&G Idaho, Inc., Regulatory and Technical Assistance Unit.

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1. INTRODUCTION

Contained herein is a technical evaluation of relief requests from the pump and valve inservice testing (IST) program submitted by Boston Edison Company for its Pilgrim Nuclear Power Station.

A working meeting was held with Boston Edison Company and Pilgrim Power Station representatives on August 7, 1990. By a letter dated October 25, 1990, Boston Edison Company submitted Revision 1 of the IST program for Pilgrim Power Station for their second ten-year IST interval, which runs from December 7, 1982 to December 7, 1992. This revision supersedes all previous submittals. The licensee's relief requests for safety-related pumps and valves are evaluated for compliance with requirements of the ASME Boiler and Pressure Vessel Code (the Code), Section XI, 1980 Edition through Winter of 1980 Addenda, 10 CFR 50.55a, and applicable NRC positions and guidelines. This technical evaluation report (TER) does not address any IST program revisions after those noted above. Program changes involving additional or revised relief requests should be submitted to NRC separately, but should not be implemented prior to review and approval by NRC. Other IST program revisions should follow the guidance of NRC Generic Letter No. 89-04 (GL 89-04), "Guidance on Developing Acceptable Inservice Testing Programs."

In their submittal, Boston Edison Company has requested relief from the ASME Code testing requirements for specific pumps and valves and these requests are evaluated individually against the requirements of 10 CFR 50.55a. This review used the acceptance criteria of the Standard Review Plan, Section 3.9.6, the Draft Regulatory Guide and Value/Impact Statement titled "Identification of Valves for Inclusion in Inservice Testing Programs," and GL 89-04. The IST program testing requirements apply only to component testing (i.e., pumps and valves) and are not intended to provide the basis to change the licensee's current Technical Specifications for system test requirements.

Section 2 of this report presents the Boston Edison Company bases for requesting relief from the Section XI requirements for the, pump testing program and EG&G's evaluations and conclusions regarding these requests. Section 3 presents similar information for the valve testing program.

Appendix A lists inconsistencies and omissions in the licensee's program noted during the relief request review. The licensee should resolve these items according to the evaluations, conclusions, and guidelines presented in this report.

The review of Boston Edison Company justifications for exercising Category A, B, and C valves during cold shutdowns and refueling outages instead of quarterly during power operations found them to be acceptable except as noted in Appendix A.

2. PUMP TESTING PROGRAM

The following Pilgrim Power Station IST program pump relief requests submitted by Boston Edison Company were evaluated against the requirements of the ASME Code, Section XI, 10 CFR 50.55a, and applicable NRC positions and guidelines. The Boston Edison Company bases for requesting relief and the reviewers' evaluations and recommendations follow grouped according to system.

2.1 General Pump Relief Requests

2.1.1 Time Allowed for Test Data Analysis

2.1.1.1 Relief Request. The licensee has requested relief in RP-8 from performing a complete analysis of test results according to the time allowance requirements of Section XI, Paragraph IWP-3220, for all pumps in the IST program and proposed the following method and schedule for data analysis.

2.1.1.1.1 Licensee's Basis for Requesting Relief. Test acceptance criteria is contained within the test procedures and the determination of equipment operability is made immediately by on-shift personnel. Therefore, on-shift personnel shall declare the pump inoperable and the appropriate Technical Specification action time must be started. The analysis of results for degradation requiring increased testing or engineering evaluation will then occur when the appropriate personnel are available for reviewing the inservice pump test data. The appropriate personnel are not always readily available for this review effort.

Alternate Testing: Test data will be reviewed within four (4) work days (96 hrs) following the test, excluding weekends (Saturday and Sunday) and Holidays.

2.1.1.1.2 Evaluation--The licensee has proposed to exclude weekends and Holidays when calculating the time allowed for analysis of test data. The plant test procedures contain the acceptance criteria for determining component operational readiness and the licensee has stated that appropriate declarations of inoperability shall be made or applicable Technical Specification Limiting Condition for Operation (LCOs) started immediately if required based on the test results. For pump test data in the alert range the data analysis will be performed within 96 hrs excluding weekends and holidays and the increased test frequency will be implemented as necessary. This is according to the provisions of NRC Generic Letter No. 89-04 (GL 89-04), Attachment 1, Position 8. The licensee's proposal should not adversely affect plant safety and provides equivalent protection as required by the Code and an acceptable level of quality and safety.

Based on the determination that the licensee's proposal provides an acceptable level of quality and safety, relief should be granted as requested.

2.1.2 Vibration Measurement Instrument Full-Scale Range

2.1.2.1 Relief Request. The licensee has requested relief in RP-9 from the vibration instrument range requirements of Section XI, Paragraph IWP-4120, for all pumps in the IST program (listed below) and proposed to measure pump vibration with an analog meter with a selectable scale and take the readings within the upper 70% of the vibration meter's full-scale.

Pump Identification	Pump Description
P-141A-B	Diesel Fuel Oil Transfer Pumps
P-202A-F	Reactor Building Closed Cooling Water Pumps
P-203A-D	Residual Heat Removal Pumps
P-205	High Pressure Coolant Injection Pump
P-206	Reactor Core Isolation Cooling Pump
P-207A&B	Standby Liquid Control Pumps
P-208A-E	Salt Service Water Pumps
P-215A-B	Core Spray Pumps

2.1.2.1.1 Licensee's Basis for Requesting Relief. The analog instrumentation (IRD) used to measure vibration amplitude has a range selector with multiples of 3 and 1 (i.e., full-scale ranges of 0.1, 0.3, 1, 3, 10 and 30). The IWP-4120 range requirement translates into requiring all measurements to be in the upper 66% of the meter scale. When measuring reference values that fall between; 0.030 to 0.033, 0.30 to 0.33, and 3.0 to 3.3, this requirement cannot be met. For these specific cases, the upper 70% of full-scale must be used. The code deviation described above occurs infrequently and is so minute, the effects are insignificant when compared to the many variables encountered during vibration data collection. Measuring reference values using the upper 70% of the meter full-scale does not impact vibration measuring consistency for monitoring pump degradation.

Alternate Testing: Pump vibration reference values will be measured within the upper 70% of the vibration meter's full scale.

2.1.2.1.2 Evaluation--Section XI, Paragraph IWP-4120 requires the full-scale range of each instrument to be three times the reference value or less. Vibration instruments often have multiple switchable ranges to allow accurate readings over the wide variety of pump vibration levels that are encountered during testing, which makes compliance with the instrument range requirements difficult for vibration instruments. The licensee has proposed to measure vibration within 70% of the meter's full-scale for the reference vibration values identified above. This will yield the maximum accuracy obtainable with the instrument in these ranges, however, it is less than required by the Code for the small band at the bottom of each range. To require the licensee to purchase instruments with slightly higher accuracies in these small ranges would be costly and a hardship without a compensating increase in the level of safety. Therefore. the licensee's proposal provides a reasonable alternative to the Code requirements.

Based on the determination that the licensee's proposal provides a reasonable alternative to the Code requirements and that the hardship associated with compliance with the Code requirements would not be offset by a compensating increase in the level of safety, relief should be granted from the Code requirements as requested.

2.2 Reactor Building Closed Cooling Water System

2.2.1 Relief Request

The licensee has requested relief in RP-1 from measuring individual pump flow rate quarterly according to the requirements of Section XI, Table IWP-3100-1, for the reactor building closed cooling water (RBCCW) system

pumps, P-202A through P-202F, and proposed to measure pump shutoff head quarterly and to measure the individual pump flow rate and pressure each refueling outage.

2.2.1.1 Licensee's Basis for Requesting Relief. Reactor Building Closed Cooling Water System instrumentation is not configured to measure individual pump flow rate during plant operation. Redesign of the system would be necessary to install flow instrumentation or to utilize portable flow instrumentation. Piping configuration does not permit installation of flow orifices on the pump discharge piping that would be consistent with good instrument practices. Adequate distance downstream of elbows is not available on the individual pump discharge prior to where discharge piping joins a common header.

The RBCCW system is part of the ultimate heat sink for containment cooling functions and reactor vessel shutdown cooling. Test loops do not exist for individual pump flow tests; therefore, disturbance of the system normal configuration during operation and cold shutdown conditions will have a negative impact on the plants ability to safely operate or maintain the plant in the cold shutdown condition.

There is no method available to control the flow rates of individual pumps. Shutoff head will provide a repeatable parameter for measuring pump performance. Individual pump flow rate and pressure will be measured each refueling outage.

Alternate Testing: Measure pump shutoff head quarterly. Measure individual pump flow rate and pressure each refueling outage.

2.2.1.2 Evaluation--These RBCCW pumps provide cooling flow for various important components in the reactor building. It is impractical to individually measure the flow rate of each pump quarterly during power operation since their discharge lines are not instrumented for this measurement and the large cooling load does not allow operation of only one pump. The flow characteristics in these discharge line sections (turbulent flow) do not support installation of instruments to accurately measure each pump's flow rate. Installing these instruments or new test loops to allow quarterly testing according to the Code requirements would require significant system redesign and modifications, which would be costly and burdensome to the licensee. To obtain individual pump flow rate data the other pumps must be stopped or isolated and the flow directed through the common flow element. The system cooling loads supplied by these pumps during power operation are many and large. It would be very difficult and burdensome to require reconfiguring system loads to allow testing these pumps according to the Code requirements quarterly during power operation.

The licensee has proposed to perform pump shutoff head tests quarterly for these pumps and to test them according to the Code requirements during refueling outages. The acceptance criteria for the parameters (vibration and differential pressure) measured during the quarterly shutoff head test must be established according to the Code criteria for alert and required action ranges except where relief has been requested and has been granted. The proposed quarterly test gives some information on pump condition, but, is very limited in its ability to assess pump operational readiness. A meaningful

test should be performed on these pumps as near to the Code specified interval (quarterly) as practicable.

System cooling demands during short duration cold shutdowns might make it impracticable to test each of the six pumps each cold shutdown. However, it should be reasonable to test the three pumps in one of the loops at each cold shutdown. By splitting plant loads between RBCCW loops A and B on the approach to cold shutdown each of the three pumps in loop A or B might be tested on an alternating basis during each cold shutdown. During extended cold shutdowns, when ample time is available, all six of these pumps should be tested. Testing these pumps according to the Code test method requirements should begin as soon as practicable (within 48 hours) during cold shutdown and continue until all pumps are tested or the plant is ready to start up. For extended cold shutdowns when all pumps will be tested the 48 hour limit does not apply.

Based on the determination that compliance with the Code requirements is impracticable, and considering the licensee's proposal, and the burden on the licensee if the Code requirements are imposed, relief should be granted provided the licensee performs the quarterly shutoff head test and tests these pumps each cold shutdown as described above according to the Code test method requirements and all of these pumps each refueling outage. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

2.3 Standby Liquid Control System

2.3.1 Relief Request

The licensee has requested relief in RP-3 from the test duration and measurement of pump flow rate, inlet, and differential pressure according to the requirements of Section XI, Paragraphs IWP-3300, -3500, and -4600, for the standby liquid control (SLC) pumps, P-207A and P-207B, and proposed to run the pumps for three minutes, verify adequate suction pressure, evaluate discharge pressure, and measure test tank level before and after the test to determine the pump flow rate.

2.3.1.1 Licensee's Basis for Requesting Relief. The standby liquid control pumps are required to supply the necessary flow rate at a given system pressure. The inlet pressure (no installed test equipment) will be equivalent to the static head provided by the test tank. Test tank level is established within the inservice test procedures. Also, the measurement of inlet pressure on a positive displacement pump is not a significant test parameter. The system resistance is set to specified discharge pressure reference value. Then the test tank level change is measured to determine pump flow rate.

The SLC pumps are tested by pumping into a test tank. The test tank capacity does not allow operation of the pump for longer than three minutes. Additional controls placed in the present test procedure has produced consistent test results and provides good repeatability.

Alternate Testing: Utilize pump discharge pressure reading in lieu of pump differential pressure reading and verify test tank level to ensure adequate suction pressure. The pump shall be run for a duration of exactly 3

minutes and an accurate measureme- of the test tank level before and after the 3 minute run shall be used to ..ify test parameters.

2.3.1.2 Evaluation--These are positive displacement pumps. Their outlet pressure is dependent on the pressure of the system into which they are pumping and is not affected significantly by either inlet pressure (providing adequate net positive suction head exists) or flow rate. For these pumps, differential pressure and flow rate are not dependent variables as they are for centrifugal type pumps. For this reason, calculating or measuring inlet or differential pressure would not contribute meaningful data to utilize in monitoring pump degradation.

These pumps supply a poison solution to the reactor coolant system, however, this flow path cannot be used during quarterly testing because it would cause reactor power fluctuations and might cause a reactor shutdown. The flow path the licensee uses for quarterly testing has limited capacity and cannot support the required 5 minute pump run time. Also, this flow path is not instrumented to measure flow rate. An accurate flow rate calculation based on the change in test tank level over time would give adequate information to assess these pumps' operational readiness and provides a reasonable alternative to the Code requirements. The licensee's proposal to operate the pumps for three minutes provides a reasonable alternative to the Code test duration requirements. The licensee's proposal to set pump discharge pressure and to evaluate flow rate calculated from the rate of change in test tank level provides sufficient information to adequately monitor the hydraulic condition of these pumps and provides an acceptable level of quality and safety provided the flow rate is accurately determined.

Based on the determination the licensee's proposed alternative is essentially equivalent to the Code requirements, relief should be granted as requested provided the flow rate calculations meet the accuracy requirements of Table IWP-4110-1 for measured values.

2.4 Salt Service Water System

2.4.1 Relief Request

The licensee has requested relief in RP-5 from measuring pump flow rate according to the requirements of Section XI, Table IWP-3100-1, for the salt service water cooling system pumps, P-208A through P-208E, and proposed to measure pump shutoff head quarterly and to measure the individual pump flow rate and pressure each refueling outage.

2.4.1.1 Licensee's Basis for Requesting Relief. Salt Service Water System instrumentation is not configured to measure individual pump flow rate during operation. Redesign of the syst.n would be necessary to install flow instrumentation. Piping configuration does not permit installation of flow orifices on the pump discharge piping prior to where the pump discharge joins a common header. Ultrasonic indicators cannot be reliably utilized with the rubber lined piping used in the salt service water system, also the pump discharge piping is underground. The Salt Service Water System is the ultimate heat sink for containment cooling functions and reactor vessel shutdown cooling. Test loops do not exist for individual pump flow tests; therefore, disturbance of the system normal configuration during operation and

cold shutdown conditions will have a negative impact on the plants ability to safely operate or maintain the plant in the cold shutdown condition.

There is no method available to control the flow rates of individual pumps. Shutoff head will provide a repeatable parameter for measuring pump performance Individual pump flow rate and pressure will be measured each refueling outage.

Alternate Testing: Measure pump shutoff head quarterly. Measure individual pump flow rate and pressure each refueling outage.

2.4.1.2 Evaluation--These pumps provide cooling flow to the RBCCW and turbine building cooling water heat exchangers. It is impractical to individually measure the flow rate of each of these pumps quarterly during power operation since their discharge lines are not instrumented for flow rate measurement. The flow characteristics in these discharge line sections (turbulent flow) do not support installation of instruments to accurately measure each pump's flow rate. Installing these instruments or new test loops to allow quarterly testing according to the Code requirements would require significant system redesign and modifications, which would be costly and burdensome to the licensee. To obtain individual pump flow rate data the other pumps must be stopped or isolated and the flow from one pump directed through the common flow element. The system cooling loads supplied by these pumps during power operation are large. It is impractical to require reconfigure the system to test these pumps according to the Code requirements quarterly during power operation.

The licensee has proposed to perform pump shutoff head tests quarterly for these pumps and to test them according to the Code requirements during refueling outages. The acceptance criteria for the parameters (vibration and differential pressure) measured during the quarterly shutoff head test must be established according to the Code criteria for alert and required action ranges except where relief has been requested and has been granted. The proposed quarterly test gives some information on pump condition, but, is very limited in its ability to assess pump operational readiness. A meaningful test should be performed on these pumps as near to the Code specified interval (quarterly) as practicable.

It is not practical to test these pumps according to the Code requirements during power operation. However, the reduced system cooling demands during cold shutdowns make it reasonable to require testing these five pumps in that plant mode. Testing these pumps according to the Code test method requirements should begin as soon as practicable (within 48 hours) during cold shutdown and continue until all pumps are tested or the plant is ready to start up. For extended cold shutdowns when all pumps will be tested the 48 hour limit does not apply.

Based on the determination that compliance with the Code requirements is impracticable, and considering the licensee's proposal, and the burden on the licensee if the Code requirements are imposed, relief should be granted provided the licensee performs the quarterly shutoff head test and tests these pumps each cold shutdown as described above and tests all these pumps each refueling outage according to the Code test method requirements. For the purpose of this report, refueling outage is the plant condition as defined in

plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

2.5 Diesel Fuel Oil Transfer System

2.5.1 Flow Rate Measurement Method and Accuracy

2.5.1.1 Relief Request. The licensee has requested relief in RP-7 from directly measuring flow rate and meeting the accuracy requirements of Section XI, Paragraph IWP-4600 and Table IWP-4110-1, for the diesel fuel oil transfer pumps, P-141A and P-141B, and proposed to use a portable instrument with an accuracy of approximately ±5%.

2.5.1.1.1 Licensee's Basis for Requesting Relief -One fuel oil transfer pump supplies each day tank. There is no installed flow instrumentation for either pump. The capacity of a fuel transfer pump is approximately 28 gpm with the required design capacity of the diesel engine being 3.3 gpm. flow rate can be measured with a portable survey flow meter. The best obtainable accuracy for survey flow meters is approximately ±5%. System configuration impairs the control of discharge pressure and flow rate repeatability. Each pump can meet its design function with greater than 75% degradation.

Review of pump design has shown that this pump will still function reliably with 25% hydraulic degradation provided that bearing vibration is not successive. Both displacement and velocity vibration is monitored on these pump bearings. Therefore, relief for expanded accuracy requirements and alert/action hydraulic ranges will adequately provide for pump operability assessment.

Alternate Testing: Measurement of flow by survey flow meter with an approximate ±5% accuracy. Corrective action ranges for flow shall be: 15% degradation for the alert range and 25% degradation for the action required range.

2.5.1.1.2 Evaluation--It is impractical to directly measure these pumps' flow rate since the needed instrumentation is not currently installed in the pump test circuit. Requiring instrument installation would necessitate significant system redesign and modification, which would be costly and burdensome to the licensee.

The licensee has requested relief to measure the flow rate through these diesel fuel oil transfer pumps with a survey flow meter with an accuracy of approximately ±5%. The licensee has not shown what actual flow rate accuracy is realized nor what the repeatability of readings is. Therefore, a determination that this proposal represents an acceptable long-term alternative to the Code requirements cannot be made. The licensee is getting some hydraulic information from this proposed test that can be used to evaluate these pumps' performance and to assess their operational readiness, therefore, interim relief should be granted until the start of the licensee's next ten-year inservice testing interval.

During this interim period the licensee should evaluate methods for measuring or determining flow rate through these pumps that meets the Code accuracy requirements for that parameter, ±2%. For instance, if the pump flow

rate can be calculated by determining the volume, in gallons, pumped (from a change in day tank level) and dividing this quantity by the total pump operating time more accurately than with the survey flow meter this method should be considered. Before the end of the interim period the licensee should either comply with the Code accuracy requirements or adequately justify an alternative method that allows adequate assessment of these pumps' operational readiness and provides a reasonable alternative to the Code requirements.

Based on the determination that compliance with the Code requirements is impractical, and considering the burden on the licensee if the Code requirements are immediately imposed, and the licensee's proposal, interim relief should be granted until the start of the licensee's next ten-year inservice testing interval.

2.5.2 Pump Hydraulic Performance Acceptance Criteria

2.5.2.1 Relief Request. The licensee has requested relief in RP-7 from complying with the pump hydraulic performance acceptance criteria according to the requirements of Section XI, Paragraphs IWP-3230(a), and -3230(b), for the diesel fuel oil transfer pumps, P-141A and P-141B, and proposed to use the below listed acceptance criteria.

2.5.2.1.1 Licensee's Basis for Requesting Relief--One fuel oil transfer pump supplies each day tank. There is no installed flow instrumentation for either pump. The capacity of a fuel transfer pump is approximately 28 gpm with the required design capacity of the Diesel Engine being 3.3 gpm. Flow rate can be measured with a portable survey flow meter. The best obtainable accuracy for survey flow meters is approximately ±5%. System configuration impairs the control of discharge pressure and flow rate repeatability. Each pump can meet its design function with greater than 75% degradation.

Review of pump design has shown that this pump will still function reliably with 25% hydraulic degradation provided that bearing vibration is not excessive. Both displacement and velocity vibration is monitored on these pump bearings. Therefore, relief for expanded accuracy requirements and alert/action hydraulic ranges will adequately provide for pump operability assessment.

Alternate Testing: Measurement of flow by survey flow meter with an approximate ±5% accuracy. Corrective action ranges for flow shall be: 15% degradation for the alert range and 25% degradation for the action required range.

2.5.2.1.2 Evaluation--The licensee has requested relief from the Code specified hydraulic performance acceptance criteria for these diesel fuel oil transfer pumps and proposed to consider the pump in the alert range at a 15% decrease in flow rate and in the required action range at a 25% decrease in flow rate. The licensee has stated the pump will function reliably with 25% hydraulic degradation provided bearing degradation is not excessive. The licensee is monitoring both bearing displacement and velocity on these pumps. However, additional information is needed about how the licensee assesses changes in pump hydraulic performance to completely evaluate this submittal and grant long-term relief. The best obtainable accuracy of the instrument

used for flow rate measurement is ±5%, however, it cannot be determined if this accuracy is of the instrument's full-scale or of indicated reading, nor what accuracy has been achieved in this application.

Flow rate instrument accuracy and repeatability must be considered when assigning acceptance criteria to ensure the pump is declared inoperable and corrective action is taken when needed. For this case, an instrument with an accuracy of ±5% of full-scale (up to three times reference value) could be off by ±4.2 gpm (28 gpm * 3 * ±5%). The proposed required action value for flow rate is 21 gpm (25% of 28 gpm). If the reading is inaccurate up to ±4.2 gpm the actual flow rate at which action would be required may be as low as 16.8 gpm. This represents a 40% loss of pump hydraulic capacity, which is well below the 25% considered allowable by the manufacturer. Additionally, the proposal does not have Alert and Required Action high-side ranges for these pumps. This could allow considerable data scatter and instrument drift and is considered non-conservative. Therefore, this proposal is not acceptable for the long-term.

The licensee's proposal will take action on a seriously degraded pump and provides some information to assess to determine pump operational readiness, therefore, interim relief should be granted until the start of the licensee's next ten-year inservice testing interval. During this period the licensee should provide information to justify use of their proposed Alert and Required Action ranges and show their proposed alternative provides a reasonable alternative to the Code requirements for assessing the operational readiness of these pumps or comply with the Code specified hydraulic acceptance criteria.

3. VALVE TESTING PROGRAM

The following Pilgrim Power Station IST program valve relief requests submitted by Boston Edison Company were evaluated against the requirements of the ASME Code, Section XI, 10 CFR 50.55a, and applicable NRC positions and guidelines. The Boston Edison Company bases for requesting relief and the reviewers' evaluations and recommendations follow grouped according to system and valve Category.

3.1 General Valve Relief Requests

3.1.1 Keep-fill Makeup and Pressurization System

3.1.1.1 Relief Request. The licensee has requested relief in RV-20 from the open test frequency requirements of Section XI, Paragraph IWV-3521, for residual heat removal and core spray system keep fill makeup and pressurization valves, 1001-362B, -363A, 1400-212A, and -212B, and proposed to part-stroke exercise them open quarterly and full-stroke exercise them open during each refueling outage, not to exceed 2 years.

3.1.1.1.1 Licensee's Basis for Requesting Relief. These normally closed check valves provide keepfill makeup and pressurization which is required to maintain these systems operable. No method exists to verify forward flow exercise of these valves while they are in service. These valves shall be partially exercised by performance of the keepfill system check (venting procedure) and full exercised in the open direction by filling the system following maintenance or testing during each refueling outage.

In addition, modifications to these systems, planned for RFO #8, that add test connections, will allow reverse closure testing by flow without disassembly.

Alternate Testing: Partial exercise valves quarterly and verify a full forward flow exercise during each refueling outage, not to exceed 2 years.

3.1.1.1.2 Evaluation--These check valves are in the supply flow path for keep fill pressurization and makeup supply to the residual heat removal and core spray systems. They are simple checks, not equipped with local or remote position indication. Installation of position indication or other instruments to show valve position would require system redesign and would be costly and burdensome to the licensee. These valves must open to allow flow into these injection systems to keep them filled and pressurized with water. It is impractical to full-stroke exercise these valves open quarterly or during cold shutdowns since the affected systems are maintained full and very little flow can be established. To establish full flow through these valves requires draining and venting the affected systems, which would be very time consuming and may delay the return to power operation if performed during cold shutdowns. Therefore, this would be costly and burdensome to the licensee to perform. The licensee's proposal to part-stroke exercise these valves open quarterly and to full-stroke exercise them open during refueling outages not to exceed two years gives reasonable assurance of operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code full-stroke open test frequency requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.1.2 Excess Flow Check Valves

3.1.2.1 Relief Request. The licensee has requested relief in RV-22 from the test frequency requirements of Section XI, Paragraphs IWV-3422 and -3522, for the primary containment isolation excess flow check valves and proposed to exercise and leak rate test them each refueling outage.

3.1.2.1.1 Licensee's Basis for Requesting Relief--These excess flow check valves are the primary containment isolation valves for systems considered inservice during plant operation. These normally open instrument isolation check valves require a reverse flow exercise. Leak testing (per ASME Code) performs valve exercising in the closed direction each refueling outage.

The leak rate testing of excess flow check valves requires the reactor coolant pressure boundary (Class 1) to be at a pressure of at least 600 psig. Testing requires valving out instruments which have a high probability of causing a safety system function initiation and/or isolation. Therefore, the plant should be shutdown for testing. During plant shutdowns, the reactor coolant pressure boundary is not pressurized except when performing the once-per-refueling outage ASME Boiler and Pressure Vessel Code, Section XI, system leakage pressure test. The excess flow check valve leak testing is conducted during this system leakage pressure test.

Alternate Testing: Exercise and leak rate valves during each refueling outage.

3.1.2.1.2 Evaluation--These are excess flow check valves on instrument sensing lines which penetrate the primary containment. They are not equipped with local or remote valve position indication. Installation of position indication or other instruments to show valve position would require system redesign and would be costly and burdensome to the licensee. These valves close to restrict flow in case of excessive line leakage for their containment isolation function. Performance of valve closure verification quarterly or during cold shutdowns is impractical since this would isolate various instruments and could result in loss of control signals to vital instrumentation and subsequent unnecessary initiation of automatic safety systems. Given these concerns, testing these valves each quarter or during cold shutdowns would be burdensome to the licensee.

The licensee's proposal to exercise and leak rate test these valves according to Section XI requirements each reactor refueling outage gives adequate assurance of operational readiness and provides a reasonable alternative to the Code requirements. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

Based on the determination that compliance with the Code test frequency requirements is impractical, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements were imposed, relief should be granted as requested.

3.1.3 Check Valve Sample Disassembly and Inspection

3.1.3.1 Relief Request. The licensee has requested relief in RV-27 from the test method and frequency requirements of Section XI, Paragraphs IWV-3522, for the check valves listed in RV-27 and proposed to perform sample disassembly and inspection of these valves per GL 89-04, Position 2.

3.1.3.1.1 Licensee's Basis for Requesting Relief--These check valves are normally closed and must open to perform their function. System design inhibits the verification of full open position during flow testing due to system configuration or limitations. These valves will be placed in a check valve disassembly program, complying with the guidelines of GL 89-04. Other check valves which require a disassembly to verify operability may be incorporated into this program as long as the alternate testing guidelines are followed.

Alternate Testing: A sample disassembly and inspection plan which selects one valve in each group to be disassembled every refueling outage will be utilized. Sample groups may consist of more than 4 valves, however, all valves within each group must be disassembled within a maximum of 4 refueling outages.

The sample disassembly and inspection program involves grouping similar valves and testing one valve in each group during each refueling outage. The sampling technique requires that each valve in the group be the same design (manufacturer, size, model number, and materials of construction) and have the same service conditions including valve orientation. During each disassembly, the licensee will verify that the disassembled valve is capable of full-stroking (through manual exercise) and that the internals of the valve are structurally sound (no loose or corroded parts).

A different valve for each group is required to be disassembled, inspected, and manually full-stroke exercised at each successive refueling outage, until the entire group has been tested. If the disassembled valve is not capable of being full-stroke exercised or there is binding or failure of valve internals, the remaining valves in that group must also be disassembled, inspected, and manually full-stroke exercised during the same outage. Once this is completed, the sequence of disassembly will be repeated unless extension of the interval can be justified.

3.1.3.1.2 Evaluation--For some check valves, licensees cannot practicably establish or verify sufficient flow to full-stroke exercise the valves open. The NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open as discussed in GL 89-04, Position 2. The licensee has proposed to utilize a sample disassembly and inspection plan which complies with GL 89-04, Position 2, and to keep a listing of the valve groupings in the IST program. The valves which are being included in the

disassembly program should be evaluated to determine if a part-stroke exercise with flow can be performed after reassembly.

The licensee states "Other check valves which require disassembly to verify operability may be incorporated into this program as long as the alternate testing guidelines are followed." The GL 89-04 meeting minutes address this issue, "If the provisions of Position 2 are followed, a relief request need not be submitted for NRC review but this deviation from the ASME Code should be documented." It is therefore acceptable for the licensee to add valves to the disassembly groups listed in the IST program that are not specifically mentioned in this request for relief, provided the guidelines in GL 89-04 are followed.

Disassembly, inspection, and manual full-stroke of the valve disk can adequately ascertain a check valve's internal condition. However, disassembly and inspection should be used to manually exercise check valves open only when full forward flow testing is impractical. The NRC staff considers check valve disassembly and inspection to be a maintenance procedure that is not a test and not equivalent to the exercising produced by fluid flow as required by Section XI. This procedure has some risks which may make its routine use as a substitute for testing undesirable when some other testing method is possible. Check valve disassembly is a valuable maintenance tool that can provide a great deal of information about valve internal condition and as such should be performed under the plant maintenance program at a frequency commensurate with the valve type and service.

The licensee should actively pursue the use of alternate testing methods to full-stroke exercise these valves, such as using non-intrusive diagnostic techniques to demonstrate whether they swing fully open during partial flow testing. When valve operational readiness cannot practicably be determined by observation of system parameters, disassembly and inspection may be used as an alternative, however, the licensee should perform post maintenance testing (e.g., forward and reverse flow closure testing) of each valve prior to returning it to service following the disassembly and inspection procedure. If another method is developed to verify the full-stroke capability of these check valves, the affected relief request should be revised or withdrawn.

For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

Based on the determination that compliance with the Code test method requirements is impracticable, and considering the licensee's proposal, and the burden on the licensee if the Code requirements are imposed, relief should be granted provided the licensee's disassembly and inspection program for check valves complies with GL 89-04, Position 2.

3.1.4 Containment Isolation Valves

3.1.4.1 Relief Request. The licensee has requested relief in RV-28 from the corrective action requirements of Section XI, Paragraph IWV-3427(b), for the Category A and A/C containment isolation valves listed in the IST program and proposed to repair or replace these valves as determined by the licensee or when the leakage rate exceeds that as stated in plant Technical Specifications or IWA-3427(a).

3.1.4.1.1 Licensee's Basis for Requesting Relief--Local leakage rate test data trending does not provide reliable evidence for predicting future leak rate test failures. Many of these valves are located inside primary containment or high radiation areas. Misapplication of trended data will result in increased test frequency which places unjustifiable operational constraints upon the plant by requiring extended shutdowns Also, testing on an increased frequency with questionable basis increases radiation exposure for testing personnel inconsistent with PNPS ALARA practices. Presently, testing is conducted during refueling outages (not to exceed 2 years) to minimize exposure. The usefulness of the trend data does not justify the burden of Corrective Action Requirements. Therefore, corrective action per IWV-3427(b) will not be conducted based on unjustifiable operational constraints and ALARA considerations. This position is supported within GL 89-04.

Alternate Testing: Containment isolation valves will be replaced or repaired as determined by the licensee or when the leakage rate exceeds that as stated in PNPS Tech Specs or IWA-3427(a).

3.1.4.1.2 Evaluation--Industry experience has demonstrated that the corrective actions of IWV-3427(b) are not practical for containment isolation valves because valve leakage rates vary widely from test to test due primarily to the valves seating differently. Therefore, variations in valve leakage rates may not be due to valve degradation and the Code criteria could require corrective actions on valves that are in good condition. The NRC staff addresses this issue in GL 89-04, Position 10. Testing these valves according to Position 10 gives adequate assurance of valve operational readiness and provides a reasonable alternative to the Code requirements.

More information is needed to completely evaluate the licensee's proposal and grant relief as requested. It is not clear whether the licensee has proposed to comply with both PNPS Technical Specification leakage rate requirements and IWV-3427(a) or either. The relief request does not specify what the specified leakage rate limits will be.

Based on the determination that the licensee's proposal would provide an adequate level of quality and safety, relief should be granted provided the licensee tests these valves according to GL 89-04, Position 10.

3.1.5 Power-Operated Valves

3.1.5.1 Relief Request. The licensee has requested relief in RV-29 from stroke timing and apolying the acceptance criteria requirements of Section XI, Paragraph IWV-3417(a), for various power-operated valves listed in the IST program and proposed to compare measured stroke times against reference stroke times and the criteria of IWV-3417(a) to determine if corrective action is needed.

3.1.5.1.1 Licensee's Basis for Requesting Relief--Historical stroke time data has shown that establishing an increased test frequency based on the most recent previous stroke time is not the most reliable method for detecting a valve's degraded condition. This method allows for gradual degradation of a valve without requiring corrective action. Determining a reference value based on stroke times when the valve is known to be in good

condition and operating properly, then measuring deviation from this established bench mark will more reliably monitor for valve degradation.

Alternate Testing: Valve stroke times shall be compared against a reference stroke time for IWV 3417(a) Corrective Action Implemertation. Reference stroke times will be determined by a PNPS Station Instruction.

3.1.5.1.2 Evaluation--Basing the trending of stroke times for power-operated valves on the stroke time measured for a valve during its previous test can permit gradual degradation of a valve over an extended period of time without requiring any action until the limiting value of full-stroke time is exceeded. The licensee has proposed to establish reference stroke times for these valves and to evaluate the test results to determine the amount of deviation from this reference value and to apply the acceptance criteria of IWV-3417(a). This is more conservative than the Code requirements and provides an acceptable level of quality and safety because it will not permit a gradual increase in valve stroke time without requiring corrective action.

Based on the determination that the licensee's proposal provides a reasonable alternative to the Code requirements, relief should be granted as requested.

3.1.5.2 Relief Request. The licensee has requested relief in RV-29 from the acceptance criteria requirements of Section XI, Paragraph IWV-3417(a), for power-operated valves with reference stroke times between one and five seconds, listed in the IST program, and proposed to increase the test frequency to monthly when their stroke times deviate by greater than 1.5 x reference time plus one half second.

3.1.5.2.1 Licensee's Basis for Requesting Relief--For POVs (excluding motor operated), recording of fast stroke times (with reference times between 1 and 5 seconds) can result in deviations greater than 50% (e.g., human error, rounding off practices, normal stroke deviation, and actuator source fluctuation) above the reference stroke time without significant valve degradation. These deviations may occur even though stroke times are recorded to within the nearest tenth of a second (which is far more restrictive than IWV). The increased frequency testing requirement for these specific valves as stated below will account for this condition to minimize unnecessary Corrective Action and excessive valve cycling.

Alternate Testing: POVs (excluding motor-operated) whose reference times are between 1 and 5 seconds shall have their test frequency increased to monthly when their stroke times deviate by greater than [1.5 x reference time plus one half second].

3.1.5.2.2 Evaluation--The licensee has requested relief from the stroke time acceptance criteria established in the Code for power-operated valves with stroke times between one and five seconds. The values of stroke time for valves that stroke quickly can be greatly affected by factors unrelated to valve condition and may not be indicative of changes in valve performance. The NRC staff addresses stroke time acceptance criteria for rapid-acting valves in GL 89-04, Position 6. This position considers valves with stroke times less than two seconds to be most susceptible to variations in operator response and other errors associated with stroke timing. For

valves with longer stroke times these limitations are less of a factor and may not justify relaxing the requirements. General relief from the Code specified acceptance criteria for a varied group of valves with stroke times between one and five seconds cannot be granted without more specific information. To obtain relief from the Code stroke time acceptance criteria for valves with stroke times in this range the licensee should describe the specific situations where the Code criteria are considered to be excessively burdensome or impracticable and show that their proposed alternative gives adequate assurance of operational readiness.

Since the licensee has not shown that the Code requirements are excessively burdensome or impractical or that their proposed alternative provides a reasonable alternative to the Code requirements, relief should not be granted as requested.

3.1.6 Leakage Important Valves

3.1.6.1 Relief Request. The licensee has requested relief in RV-30 from leak testing valves according to the requirements of Section XI, Paragraph IWV-3420, for leakage important valves listed in the IST program and proposed to perform pressure decay tests utilizing a pressure boundary specified leakage limit.

3.1.6.1.1 Licensee's Basis for Requesting Relief--Seat leak testing of valves categorized as "A" or "AC" normally involves a determination of specific leakage for each valve. Where a valve becomes an integral part of a pressure boundary, it no longer singularly maintains the specified leakage limit. Each component within the pressure boundary must be considered when trying to satisfy the Acceptance Criteria. No one component or multiple components is allowed to leak in excess of the specified leakage limit. The method commonly used to verify leak tightness of a pressure boundary is a pressure drop (decay) test. The American Society for Non-Destructive Testing (ASNT) provides testing guidance (Reference: ASNT Non-Destructive Testing Handbook, Volume 1, Leak Testing) in which the results are equivalent and sometimes superior to Section XI, IWV-3420. This testing will be conducted at least once every 2 years.

This relief does not apply to containment isolation valves, pressure isolation valves or other valves that have a component-specific leakage limit.

Alternate Testing: Perform pressure drop (decay) tests in lieu of IWV-3420 valve leak rate tests, utilizing a pressure boundary specified leakage limit.

3.1.6.1.2 Evaluation--It is not practicable to individually leak rate test certain valves due to system design or the lack of appropriate test taps. To facilitate individual leakage rate testing of these valves would require significant system redesign and would be very burdensome to the licensee. The licensee has proposed to test valves included within a pressure boundary as a group using a pressure decay test with a specified leakage limit applied to the group. The licensee will use guidance for this testing from the American Society for Non-Destructive Testing (ASNT) Handbook, Volume 1.

For valves that can be tested only in groups it is impractical to analyze individual valve leakage rates or compare them to Owner specified

values, as required by IWV-3426 and -3427(a), since individual valve leakage rates cannot be isolated. The corrective action required in IWV-3427(a) will be applied to the group, when the group fails the acceptance criteria established for the pressure decay test, the suspect valves shall be repaired or replaced. Also trending of leakage rates may not be practicable since the various valves may seat slightly different after each stroke. This would make valve performance projections based on trended leakage values questionable, therefore, it is impractical to meet the requirements of IWV-3427(b) for these valves. "Measuring leakage through a downstream telltale connection" as required in IWV-3424 will be indirectly accomplished by monitoring the pressure decay of the boundary being tested. Therefore, it is impractical to meet the requirements of IWV-3424. It has not been established that the testing required by the ASNT handbook is equivalent to the testing required by IWV-3420 for evaluating individual component leak tight integrity, therefore the licensee should follow the testing outlined in paragraphs IWV-3421 thru -3423 and IWV-3425.

It is not specified in this relief request what valve sizes are in the groupings or what the "specified leakage limit" for each group will be. When testing a group of valves it is often very difficult to distinguish if the measured leak rate is the result of a small amount of leakage through each valve in the group or if it is attributable to only one valve. Corrective action must be taken on a particular valve that has become degraded. The smallest valve in the group is typically assigned the most limiting leakage rate and, therefore, the leakage limit for the group should be based on the acceptable leakage of the smallest valve in the group.

It is possible that a valve grouping would include valves that can practicably be tested individually. Those valves should be individually leak rate tested per the Code requirements. If those valves are also tested with other valves in groups their known leakage can be subtracted out to better isolate and allow an evaluation of the other group valves' leak tight integrity. This should give adequate assurance of valve operational readiness and provide a reasonable alternative to the Code requirements.

Based on the determination that compliance with IWV-3424, -3426, and -3427 is impracticable for the above listed valves that can be tested only in groups and considering the burden on the licensee if the Code requirements were imposed, relief should be granted from the requirements of IWV-3424, -3426 and -3427 provided: (a) valves that can be tested individually are tested in accordance with the Code requirements and (b) maximum group leakage rate limits assigned are based on acceptable leakage through the smallest valve in the group.

3.2 Control Rod Drive Hydraulic System

3.2.1 Category B Valves

3.2.1.1 Relief Request. The licensee has requested relief in RV-17 from the test method requirements of Section XI, Paragraphs IWV-3411, -3413, and -3415, for control rod drive (CRD) insertion and withdrawal power-operated valves, 120, 121, 122, 123 (typical), and proposed to verify operation weekly by notching the control rods.

3.2.1.1.1 Licensee's Basis for Requesting Relief--The insertion and withdrawal of control rods is accomplished via positioning of these valves. The CRD units are integrally constructed components. Notching of control rods causes rapid position changes to these valves. The recording of stroke time (e.g., less than tenth of a second) would only be indication of electrical circuitry delay and human response errors. Prior insertion/withdrawal by notching shall verify valve operability.

Alternate Testing: Verify control rod movement by notching weekly.

3.2.1.1.2 Evaluation--These are fast-acting solenoid valves which align to cause insertion or withdrawal of the control rods. There are four valves for each hydraulic control unit. It is impractical to accurately stroke time each of these valves. Obtaining accurate stroke times for each of these valves might require significant system redesign or installation of special test equipment, which would be costly and burdensome to the licensee. These valves are exercised weekly during notching of the control rods and must operate in a timely fashion to move the rods. Failure or significant degradation of these valves should be evident during this weekly testing, however, accurately stroke timing each valve quarterly is not practicable. The licensee's proposal to verify operation of these valves each week during rod movement should give adequate assurance of valve operational readiness and provide a reasonable alternative to the Code requirements.

Based on the determination that compliance with the Code requirements is impractical, and considering the licensee's proposal and the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.2.1.2 Relief Request. The licensee has requested relief in RV-26 from the test frequency requirements of Section XI, Paragraph IWV-3413, for the CRD seal and scram discharge volume drain valves, 21A, B, 22A, B, 23A, B, 24A, and B, and proposed to measure the closed stroke times and trend this data each refueling outage.

3.2.1.2.1 Licensee's Basis for Requesting Relief--These air operated valves are stroked closed quarterly using a separate testing air vent (bleed) circuit. Stroke times using the test circuit are erratic and can even exceed the Tech Spec Acceptance Criteria. Once per refueling outage, in accordance with Tech Specs, a full reactor scram is initiated which utilizes the normal vent circuit for these valves. The valves are timed in their closed direction using electronic means. Trending these valves in the closed direction is impractical and meaningless because variations in the quarterly test stroke time do not reflect valve degradation. Valve open stroke times are measured and trended quarterly to monitor for valve degradation.

Alternate Testing: Measure close stroke times electronically by inserting a full reactor scram during each refueling outage in accordance with Tech Specs. Perform closed direction stroke time trending following Tech Spec refueling outage testing.

3.2.1.2.2 Evaluation--These are normally open air-operated valves in the lines from the scram discharge headers. They close after a reactor scram to limit the loss of primary coolant past the CRD unit seals. It is impractical to scram the reactor quarterly to stroke time test these valves.

System redesign and modifications might be necessary to allow testing these valves quarterly during power operation according to the Code requirements, which would be costly and burdensome to the licensee. The licensee is stroke time testing these valves in the open direction quarterly and trending the results. This test gives some indication of valve condition and allows a degree of assessment of operational readiness. These valves close in response to a scram signal or a manually initiated loss of control air. Bleeding air from the valve operator to cause these valves to close might not yield accurate closed stroke times for evaluating operational readiness in that direction due to differences in the bleed rate. However, a scram signal is generated each cold shutdown, which should allow accurate stroke timing of these valves at that time.

The licensee has not shown that it is impractical to stroke time test these valves closed quarterly, however, this test may require scramming the reactor, lifting electrical leads, or otherwise disrupting the system electrically, which is not advised. The licensee has not shown that it is impractical to stroke time test these valves closed each cold shutdown when the control rods are scrammed. The licensee's proposal to stroke time test these valves open quarterly and to trend the results and to stroke time test them closed each refueling outage and to trend those results should give adequate assurance of valve operational readiness and provide a reasonable alternative to the Code requirements for an interim period until the start of the licensee's next ten-year inservice testing interval. During the interim period the licensee should provide information to justify not testing these valves quarterly or during cold shutdowns when a scram signal might be used to stroke time the valves. The licensee should show their proposed alternative provides a reasonable alternative to the Code requirements for assessing valve operational readiness or comply with the Code stroke time requirements in the closed direction for these valves.

Based on the determination that compliance with the Code requirements to stroke time test these valves closed quarterly may be impractical, and considering the licensee's proposal and the burden on the licensee if the Code requirements are imposed, interim relief should be granted as requested until the start of the licensee's next ten-year inservice testing interval.

3.2.1.3 Relief Request. The licensee has requested relief in RV-09 from the test method and frequency requirements of Section XI, Paragraphs IWV-3411, -3413, and -3415, for the scram inlet and outlet valves 126 and 127 (typical), and proposed to perform scram functional timing per plant Technical Specifications and to verify individual valve exercise and fail-safe per the schedule described below.

3.2.1.3.1 Licensee's Basis for Requesting Relief--These valves (with the exception of the 115) operate coincidentally to rapidly insert control rods and will be tested by SCRAM timing control rod drives in accordance with Technical Specification Section 4.3. This requires testing of at least 10% of the drives every 120 days. Additionally, 100% of the drives are tested during each shutdown that is greater than 120 days in duration. Timing of the SCRAM function will be substituted for individual stroke timing.

Alternate Testing: Scram functional timing in accordance with Plant Tech Specs will be used to verify individual valve fail-safe and exercise testing for valves 126 and 127.

3.2.1.3.2 Evaluation--These valves cannot be exercised without causing the associated control rod to scram and they must operate properly in order that the associated control rod meets the scram insertion time limits defined in the Technical Specifications. Testing all these valves each quarter is impractical since it would result in excessive wear on the control rod drive mechanisms and expose the reactor core to an excessive number of rapid reactivity transients. Additionally, system modifications would be necessary to allow direct stroke timing of these valves, which would be costly and burdensome to the licensee.

The licensee has stated that these valves will be fail-safe and exercise tested per plant Technical Specification requirements, however, these tests have not been thoroughly described. Testing these valves is addressed in GL 89-04, Position 7, on Testing Individual Control Rod Scram Valves in Boiling Water Reactors (BWRs), which provides a reasonable alternative to the Code requirements. Relief should be granted provided the licensee tests these valves according to this GL Position. If the licensee intends to test these valves differently from the Code requirements and the GL Position a relief request should be submitted that describes the proposed test and shows the proposed test and frequency gives adequate assurance of operational readiness and provides a reasonable alternative to the Code requirements.

Based on the determination that compliance with the Code requirements is impracticable and considering the burden on the licensee if the Code requirements are imposed and the licensee's proposal, relief should be granted provided the licensee complies with GL 89-04, Position 7, for these valves.

3.2.2 Category C Valves

3.2.2.1 Relief Request. The licensee has requested relief in RV-09 from the test method and frequency requirements of Section XI, Paragraph IWV-3521, for valves 114 and 115 (typical) the CRD discharge header check and accumulator supply check valves and proposed to verify fail-safe and exercising of valve 114 (and opening of 115) during scram functional testing and to verify closure of 115 each refueling outage.

3.2.2.1.1 Licensee's Basis for Requesting Relief--These valves (with the exception of the 115) operate coincidentally to rapidly insert control rods and will be tested by SCRAM timing control rod drives in accordance with Technical Specification Section 4.3. This requires testing of at least 10% of the drives every 120 days. Additionally, 100% of the drives are tested during each shutdown that is greater than 120 days in duration. Timing of the SCRAM function will be substituted for individual stroke timing.

The accumulator supply check valves (115) will be verified as forward flow exercised by observing that their respective CRD accumulator fault lights clear following restoration from scram time testing. In addition, this valve is verified closed by securing the CRD pumps and verifying an absence of annunciator indication or significant local pressure degradation from the HCU scram accumulators each refueling outage.

Alternate Testing: Scram functional timing in accordance with Plant Tech Specs will be used to verify individual valve exercise testing for valves 114. The accumulator supply check valves (115) will be verified as forward flow exercised during restoration from scram time testing.

3.2.2.1.2 Evaluation--Valve V114, control rod scram discharge header check is located in the scram discharge line for the associated CRD. This valve must open to allow the control rod to scram. Proper operation is verified during control rod scram testing if the associated control rod meets the scram insertion time limits defined in the Technical Specifications. Testing all these valves each quarter is impractical since it would result in excessive wear of the control rod drive mechanisms and expose the reactor core to an excessive number of rapid reactivity transients. System redesign and modifications would be needed to allow more frequent testing of these valves would be costly and burdensome to the licensee.

Valve V115, accumulator charging header check is located in the accumulator charging water line and must close when the associated control rod is scrammed to prevent diversion of flow away from the scram flow path in the event the accumulator charging header became depressurized. However, since this valve is not equipped with position indication, the only practicable method available to verify closure is the licensee's proposed accumulator pressure decay test, which is performed in accordance with Technical Specifications. Since the charging header must be depressurized for the performance of this test it is impractical to perform this test quarterly during plant operation or when the reactor recirculation pumps are running during cold shutdown. Modifications to allow testing of these valves quarterly during power operation would be costly and burdensome to the licensee.

The licensee's proposed alternate testing for these valves is similar to GL 89-04, Position 7, on Testing Individual Control Rod Scram Valves in Boiling Water Reactors (BWRs), which provides a reasonable alternative to the Code requirements. However, insufficient information is provided to determine that it complies with this GL position.

Based on the determination that compliance with the Code requirements is impracticable and considering the burden on the licensee if the Code requirements are imposed and the licensee's proposal, relief should be granted provided the licensee complies with GL 89-04, Position 7, for testing these valves.

3.3 Nuclear Boiler System

3.3.1 Category A/C Valves

3.3.1.1 Relief Request. The licensee has requested relief in CS-13 from the exercise test frequency requirements of Section XI, Paragraph IWV-3521, for the air accumulator supply valves for the automatic depressurization system (ADS) valves, 372A through D, and proposed to exercise them open and closed during cold shutdowns when containment is deinerted.

3.3.1.1.1 Licensee's Basis for Requesting Relief--These check valves with their associated air accumulators are located in the drywell (primary containment) and are not accessible during normal plant operations. Check valve forward flow exercising will be accomplished by bleeding air through the air accumulators. Therefore, exercising of these check valves will be performed during cold shutdown when the drywell is deinerted.

Alternate Testing: Exercise valves during cold shutdown (when drywell is deinerted) not to exceed a refueling outage.

3.3.1.1.2 Evaluation--These valves close to maintain the store of energy in the ADS air accumulators and open to allow the accumulator to recharge. Testing these valves is impractical with the reactor operating or the containment inerted as this testing requires personnel entry into the containment building. It would be costly and burdensome to the licensee to require de-inerting containment every cold shutdown because of the delay it could cause in plant start-up due to the time and expense associated with de-inerting and re-inerting containment. The licensee's proposal to full-stroke exercise these valves during reactor shutdowns when the containment is de-inerted provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that testing these valves in accordance with the Code test frequency requirements is impractical, that the licensee's proposed test frequency provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted from the Code test frequency requirements as requested.

3.3.2 Category B Valves

3.3.2.1 Relief Request. The licensee has requested relief in CS-05 from the stroke timing and test frequency requirements of Section XI, Paragraphs IWV-3411 and -3412, for the reactor recirculation pump discharge valves, 5A and 5B, and proposed to exercise them during cold shutdowns when the respective reactor recirculation pump is not required. This will be performed at least each refueling outage.

3.3.2.1.1 Licensee's Basis for Requesting Relief--Closure of these valves during normal operation will result in loss of forced circulation to the reactor, a condition prohibited by PNPS License.

Closure of these valves during cold shutdown necessitates securing operation of the reactor recirculation pumps. This is detrimental because even though the moderator temperature is less than 212°F the recirculating system is usually kept in operation during cold shutdown to provide reactor coolant mixing to prevent reactor vessel temperature stratification. The reactor vessel temperature profile takes on an increasing temperature gradient between the bottom vessel head and the shutdown core when mixing (forced circulation) is stopped. Additionally the water in the idle recirculation loops cools down. This stratification can have the following adverse effects: reactor vessel temperatures become greater between the vessel bottom and top resulting in unnecessary thermal cycling, startup of the shutdown recirculation pump can cause a cold water intrusion affecting reactor vessel metal temperatures. Deliberate stopping and starting of the recirculation pumps creates unnecessary cycling wear on major equipment important to plant reliability.

Alternate Testing: Exercise valves during cold shutdown when a respective reactor recirculation pump is not required, but not to exceed a refueling outage.

3.3.2.1.2 Evaluation--These are the reactor recirculation pump discharge valves. Their function is to close upon a loss of coolant accident (LOCA) plant protection signal to direct low pressure coolant injection into the reactor vessel. It is impractical to exercise these valves at any time during power operation. It is also impractical to exercise these valves during cold shutdowns when the affected loop reactor recirculation pump is operating. Stopping the recirculation pumps during each cold shutdown to allow exercising these valves could result in extending the shutdown which would be costly and burdensome to the licensee. The licensee's proposal to exercise these valves during cold shutdowns when the reactor recirculation pumps are off and during refueling outages provides a reasonable alternative to the Code test frequency requirements. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

Based on the determination that compliance with the Code test frequency requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.3.3 Category C Valves

3.3.3.1 Relief Request. The licensee has requested relief in RV-18 from the test method requirements of Section XI, Paragraph IWV-3522(b), for the main steam isolation valve (MSIV) accumulator air supply check valves, 84A, B, C, & D, and 85A, B, C, & D, and proposed to verify their full-stroke open capability by forward flow exercising them during MSIV full-stroke valve cycle testing.

3.3.3.1.1 Licensee's Basis for Requesting Relief--These check valves are required to supply nitrogen/instrument air to recharge air accumulators during each Main Steam Isolation Valve (MSIV) full-stroke cycle. Failure of a check valve to open (forward flow exercise) would impede accumulator recharging and prevent the normal opening function of the MSIV. Therefore, MSIV full-stroke exercise verifies the respective air accumulator check valve forward flow exercise.

Alternate Testing: Verify forward flow exercising by MSIV full-stroke valve cycle testing.

3.3.3.1.2 Evaluation--These check valves are in the supply lines to the MSIV air accumulators. These valves must open to allow accumulator recharging after operation of the associated MSIV. These are simple check valves without external operators or local or remote position indication of obturator position. The licensee has proposed to full-stroke exercise these valves open by observing operation of the MSIV. However, some criteria is needed to ensure these valves open sufficiently to pass the required flow rate for recharging the MSIV accumulator within the required time. The licensee's proposal obtains information that provides an indication of these valves' operational readiness, therefore, interim relief should be granted until the start of the licensee's next ten-year inservice testing interval. During this interim period the licensee should either comply with the Code test method requirements or adequately justify an alternate testing method that adequately

assesses the operational readiness of these valves and provides a reasonable alternative to the Code requirements.

Based on the determination that compliance with the Code requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are immediately imposed, interim relief should be granted until the start of the licensee's next ten-year inservice testing interval.

3.3.3.2 Relief Request. The licensee has requested relief in CS-12 from the open test frequency requirements of Section XI, Paragraph IWV-3521, for the main steam safety/relief discharge line vacuum relief check valves, 96A thru C, 97A thru D, and 98A thru D, and proposed to exercise them open during cold shutdowns when containment is deinerted.

3.3.3.2.1 Licensee's Basis for Requesting Relief--The SRV suppression pool discharge vacuum breakers provide a means for relieving the vacuum developed in the discharge lines caused by condensing steam. The vacuum breakers are located in the drywell (primary containment) and are normally closed. During power operation, the inerted drywell environment is unsuitable for manned entry due to atmosphere and high temperature. The forward flow exercising of these valves can only be verified manually. This method of exercising during power operation would have adverse safety and ALARA concerns. Exercising will be performed during cold shutdown when the drywell is deinerted.

Alternate Testing: Exercise valves during cold shutdown (when drywell is deinerted) not to exceed a refueling outage.

3.3.3.2.2 Evaluation--These valves open to prevent developing a vacuum in the suppression pool and close to prevent steam flow into the suppression pool air space during SRV opening. Testing these valves requires entry into the drywell and is impractical when the drywell atmosphere is inerted. It would be costly and burdensome to the licensee to require de-inerting containment every cold shutdown because of the delay it could cause in plant start-up and the expense associated with inerting containment. The licensee's proposal to full-stroke exercise these valves during reactor shutdowns when the containment is de-inerted provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that testing these valves in accordance with the Code test frequency requirements is impractical, that the licensee's proposed test frequency provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted from the Code test frequency requirements as requested.

3.4 Reactor Water Cleanup System

3.4.1 Category C Valves

3.4.1.1 Relief Request. The licensee has requested relief in RV-21 from the exercise test frequency requirements of Section XI, Paragraph IWV-3521, for the reactor water cleanup system (RWCU) return flow path to the

reactor vessel check valve, 81, and proposed to exercise it closed during leak testing each refueling outage.

3.4.1.1.1 Licensee's Basis for Requesting Relief--The reactor water cleanup return check valve shall be reversed flow exercised. This normally open check valve is verified in the closed direction by; isolating the RWCU return header, pressurizing the feedwater header, and venting the piping on the upstream side of this check valve to verify restricted flow. Controlled pressurization of the feedwater header to perform this test occurs during hydrodynamic leakage testing of the RCIC pressure isolation valves each refueling outage.

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

Alternate Testing: Exercise valve during hydrodynamic leak testing each refueling outage.

3.4.1.1.2 Evaluation--This valve is in the return flow path from the RWCU system to the reactor vessel. This is a simple check valve not equipped with an external operator or position indication. To verify this valve closes to restrict flow requires a reverse differential pressure across the valve. This is impractical to perform quarterly during power operation since this system is continuously in operation to purify the primary coolant. Hooking up test equipment to pressurize the piping upstream of this valve during cold shutdowns would likely delay the return to power operation, which would be costly and burdensome to the licensee. The licensee's proposal to verify the reverse flow closure of this valve during leak testing each refueling outage gives adequate assurance of operational readiness and provides a reasonable alternative to the Code requirements. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

Based on the determination that compliance with the Code requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.5 Diesel Fuel Oil Transfer System

3.5.1 Category C Valves

3.5.1.1 Relief Request. The licensee has requested relief in RV-23 from the test method requirements of Section XI, Paragraph IWV-3521, for the emergency diesel generator fuel oil supply check valves, 116A and 116B, and proposed to verify check valve forward flow exercise by emergency diesel generator operability testing.

3.5.1.1.1 Licensee's Basis for Requesting Relief--These check valves, located within the day tank, are required to supply fuel oil to each emergency diesel generator. Failure of a check valve to open (forward flow

exercise) would deprive the diesel of fuel. Inadequate supply of fuel oil would cause the diesel load handling capabilities to be impaired during surveillance testing. Therefore, proper operation of each emergency diesel generator during full load testing verifies the check valve forward flow exercise.

Alternate Testing: Emergency diesel operability testing will verify check valve forward flow exercise.

3.5.1.1.2 Evaluation--These are simple check valves not equipped with external operators or remote position indication. They are located inside the fuel oil day tanks and open to meet system demand for diesel fuel oil during diesel operation. When the associated diesel generator is fully loaded the system fuel oil demand flow rate constitutes the maximum flow rate required, which is a full-stroke open exercise. It is impractical to measure flow rate through these valves since there are no instruments installed in the flow paths. System modifications, such as installing flow rate meters in-line might be necessary to directly measure the flow rate through these valves, which would be expensive and burdensome to the licensee. The licensee's proposal to verify the full-stroke open capability of these valves by proper diesel operation during diesel testing gives adequate assurance of operational readiness and provides a reasonable alternative to the Code test method requirements.

Based on the determination that compliance with the Code requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.6 High Pressure Coolant Injection System

3.6.1 Category A Valves

3.6.1.1 Relief Request. The licensee has requested relief in RV-25 from the test method requirements of Section XI, Paragraph IWV-3413, for the high pressure coolant injection (HPCI) system turbine exhaust drain pot isolation valves, 9068A and 9068B, and proposed to verify the valve opening by normal HPCI system operation and to verify closure by performing local leak rate testing.

3.6.1.1.1 Licensee's Basis for Requesting Relief--These solenoid operated valves have no position indicators and are equipped with common (power on) light indication. Their fully enclosed "can" type construction prevents visual stroke movement to be observed locally. Therefore, individual valve stroke times cannot be obtained. Valve closure is verified by performance of local leak rate testing (Appendix J). Valve opening is verified by normal HPCI operation.

Alternate Testing: Valve stroke times shall not be measured.

3.6.1.1.2 Evaluation--These are totally enclosed solenoid operated valves, which have no position indicators and are equipped with common (power on) light indication. It is impractical to directly measure the stroke times of these solenoid operated valves because there is no way to determine when a valve receives a signal to close or reaches the fully closed position. These

valves may be indirectly verified open by normal HPCI operation but accurate, repeatable stroke timing using conventional techniques is impractical. System modifications would be necessary to directly measure the stroke times of these valves and would be expensive and burdensome to the licensee.

The licensee proposes to exercise test these valves quarterly and to verify closure by performing Appendix J leak rate testing every two years. This gives some assurance of valve operational readiness. But, this testing does not adequately evaluate changes in valve condition and, therefore, does not present a reasonable long term alternative to the Code requirements. Some method for quantitatively evaluating changes in valve condition, such as stroke timing, is essential for assessing valve operational readiness. Methods employing magnetics, acoustics, ultrasonics, or other technologies should be investigated for their suitability.

Based on the determination that complying with the Code requirements is impractical and considering the burden on the licensee if the Code requirements were imposed, interim relief should be granted until the start of the next 10-year interval while the licensee develops a method of quantitatively evaluating changes in valve condition.

3.7 Hydrogen/Oxygen Analyzer System

3.7.1 Category B Valves

3.7.1.1 Relief Request. The licensee has requested relief in RV-31 from the test method requirements of Section XI, Paragraph IWV-3412, for the H_2/O_2 analyzer system reagent gas supply valves, 5117A, 5117B, 5137A, and 5137B, and proposed to verify valve opening and closure by flow meter indication while operating the analyzer function selector switch.

3.7.1.1.1 Licensee's Basis for Requesting Relief--These solenoid valves are not equipped with position indicators, therefore, stroke times cannot be obtained. Valve cycling is verified by proper system operation during surveillance testing per PNPS Technical Specification requirements for H_2/O_2 Analyzer System. During system testing, placing the analyzer function selector switch to the zero position (i.e., flow meter shows a downward deflection) and then to the span position (i.e., flow meter shows an upscale movement with alarm actuation) indicates that the valves have properly cycled.

Alternate Testing: Valve stroke times shall not be measured.

3.7.1.1.2 Evaluation--These valves open automatically during operation of the H_2/O_2 Analyzer to supply reagent gases for gas concentration analysis. These are totally enclosed solenoid operated valves with no externally visible or remote indication of valve position. It is impractical to accurately measure the stroke times of these solenoid operated valves because there is no way to determine when a valve receives a signal to open or close. These valves may be indirectly verified open or closed by monitoring system parameters but accurate, repeatable stroke timing using conventional techniques is impractical. System modifications would be necessary to directly measure the stroke times of these valves and would be expensive and burdensome to the licensee.

The licensee is exercising and fail-safe testing these valves quarterly which gives some assurance of operability but does not adequately evaluate changes in valve condition and, therefore, does not present a reasonable long term alternative to the Code requirements. Some method for quantitatively evaluating changes in valve condition, such as stroke timing, is essential for assessing valve operational readiness. Methods employing magnetics, acoustics, ultrasonics, or other technologies should be investigated for their suitability.

Based on the determination that complying with the Code requirements is impractical and considering the burden on the licensee if the Code requirements were imposed, interim relief should be granted until the start of the next 10-year program interval while the licensee develops a method of quantitatively evaluating changes in the condition of these valves.

3.8 Reactor Building Closed Loop Cooling Water System

3.8.1 Category A and B Valves

3.8.1.1 Relief Request. The licensee has requested relief in CS-01 from the test frequency requirements of Section XI, Paragraph IWV-3411, for the reactor building closed cooling water (RBCCW) to drywell isolation valves, 4009A, 4009B, and 4002, and proposed to exercise them during cold shutdowns when the reactor recirculation pumps and drywell coolers are not required.

3.8.1.1.1 Licensee's Basis for Requesting Relief--The testing of these valves would require isolation of the following components; drywell area coolers, reactor recirculation pump seal coolers, reactor recirculation pump lube oil coolers and additionally; The reactor water cleanup (RWCU) non-regenerative heat exchanger, B fuel pool cooling heat exchanger, RWCU pump cooling system coolers, control rod drive (CRD) pump area cooling and CRD pump thrust bearing coolers for testing of the 4009A and 4009B. The listed components supply numerous plant systems required for safe plant operation. The recirculation pumps and drywell coolers maybe required to support the plant during cold shutdown conditions to prevent stratification of reactor vessel lower head water and overheating of drywell components.

Alternate Testing: Exercise valves during cold shutdown when recirculation pumps and drywell coolers are not required but not to exceed a refueling outage.

3.8.1.1.2 Evaluation--These valves provide cooling flow to various important components in the drywell. It is impractical to exercise these valves quarterly during power operation as this would interrupt flow to and could result in damage to these components. It is also impractical to exercise these valves during cold shutdowns when a reactor recirculation pump is operating or when drywell cooling loads are high. Stopping the recirculation pumps during each cold shutdown to allow exercising these valves could result in extending the shutdown which would be costly and burdensome to the licensee. The licensee's proposal to exercise these valves during cold shutdowns when the reactor recirculation pumps are off and drywell cooling loads allow exercising and during refueling outages provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code test frequency requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

3.8.2 Category B Valves

3.8.2.1 Relief Request. The licensee has requested relief in CS-08 from the test frequency requirements of Section XI, Paragraph IWV-3411 and -3413, for stroke timing the RBCCW loop A isolation valves, 4085A and 4085B, and proposed to exercise them during cold shutdowns when the reactor recirculation pumps are not required.

3.8.2.1.1 Licensee's Basis for Requesting Relief--Valves 4085A and 4085B are the non-safety related component isolation valves for RBCCW loop A. Components cooled by this RBCCW branch include the reactor recirculation pump motor-generator set fluid coupling oil and bearing coolers.

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

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

Alternate Testing: Exercise valves during cold shutdown when reactor recirculation pumps are not required but not to exceed a refueling outage.

3.8.2.1.2 Evaluation--These are component isolation valves for loads that are cooled by RBCCW loop A. They provide cooling flow for the reactor recirculation pump motor-generator set fluid coupling oil and bearing coolers. It is impractical to exercise these valves quarterly during power operation as this would interrupt flow to and could result in overheating and damage to these components. It is also impractical to exercise these valves during cold shutdowns when a reactor recirculation pump is operating. Stopping the recirculation pumps during each cold shutdown to allow exercising these valves could result in extending the shutdown which would be costly and burdensome to the licensee. The licensee's proposal to exercise these valves during cold shutdowns when the reactor recirculation pumps are off and during

refueling outages provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code test frequency requirements is impracticable, the licensee's proposal provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements are imposed, relief should be granted as requested.

APPENDIX A

IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

APPENDIX A
IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

Summarized below are inconsistencies and omissions in the licensee's IST program noted during this review. The licensee should resolve these items according to the evaluations, conclusions, and guidelines presented in this report.

1. The licensee has requested relief in RP-1 (See Section 2.2.1 of this report) from measuring individual pump flow rate quarterly for the reactor building closed cooling water (RBCCW) system pumps and proposed to measure pump shutoff head quarterly and to measure the individual pump flow rate and pressure each refueling outage. Relief should be granted provided the licensee performs the quarterly shutoff head test and tests these pumps as practicable each cold shutdown according to the Code test method requirements and all of these pumps each refueling outage. Testing these pumps should begin as soon as practicable (within 48 hours) during cold shutdown and continue until all pumps are tested or the plant is ready to start up. For extended cold shutdowns when all pumps will be tested the 48 hour limit does not apply. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years.

2. The licensee has requested relief in RP-3 (See Section 2.3.1 of this report) from the test duration and measurement of pump flow rate, inlet, and differential pressure according to Section XI for the standby liquid control (SLC) pumps and proposed to run the pumps for three minutes, verify adequate suction pressure, evaluate discharge pressure, and measure test tank level before and after the test to determine the pump flow rate. Relief should be granted as requested provided the flow rate calculations meet the accuracy requirements of Table IWP-4110-1 for measured values.

3. The licensee has requested relief in RP-5 (See Section 2.4.1 of this report) from measuring pump flow rate according to the requirements of Section XI for the salt service water cooling system pumps and proposed to measure pump shutoff head quarterly and to measure the individual pump flow rate and pressure each refueling outage. The reduced system cooling demands during cold shutdowns make it reasonable to require testing these five pumps in that plant mode. Testing these pumps according to the Code test method requirements should begin as soon as practicable (within 48 hours) during cold shutdown and continue until all pumps are tested or the plant is ready to start up. For extended cold shutdowns when all pumps will be tested the 48 hour limit does not apply. Relief should be granted provided the licensee performs the quarterly shutoff head test and tests these pumps each cold shutdown as described above and tests all these pumps each refueling outage according to the Code test method requirements. For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes the interval associated with refueling outage testing may be up to 2 years.

4. The licensee has requested relief in RP-7 (See Section 2.5.1 of this report) from directly measuring flow rate and meeting the accuracy

requirements of Section XI for the diesel fuel oil transfer pumps and proposed to use a portable instrument with an accuracy of approximately ±5%. Interim relief should be granted until the start of the licensee's next ten-year inservice testing interval. During this interim period the licensee should evaluate methods for measuring or determining flow rate through these pumps that meets the Code accuracy requirements for that parameter. Before the end of the interim period the licensee should either comply with the Code accuracy requirements or adequately justify an alternative method that allows adequate assessment of these pumps' operational readiness and provides a reasonable alternative to the Code requirements.

5. The licensee has requested relief in RP-7 (See Section 2.5.2 of this report) from complying with the pump hydraulic performance acceptance criteria of Section XI for the diesel fuel oil transfer pumps and proposed to consider the pump in the alert range at a 15% decrease in flow rate and in the required action range at a 25% decrease in flow rate. Interim relief should be granted until the start of the licensee's next ten-year inservice testing interval. During this period the licensee should provide information to justify use of their proposed Alert and Required Action ranges and show their proposed alternative provides a reasonable alternative to the Code requirements for assessing the operational readiness of these pumps or comply with the Code specified hydraulic acceptance criteria.

6. The licensee has requested relief in RV-27 (See Section 3.1.3.1 of this report) from the test method and frequency requirements of Section XI for the check valves listed in RV-27 and proposed to perform sample disassembly and inspection of these valves. Disassembly, inspection, and manual full-stroke of the valve disk can adequately ascertain a check valve's internal condition. However, disassembly and inspection should be used to manually exercise check valves open only when full forward flow testing is impractical. The NRC staff considers check valve disassembly and inspection to be a maintenance procedure that is not a test and not equivalent to the exercising produced by fluid flow as required by Section XI. This procedure has some risks which may make its routine use as a substitute for testing undesirable when some other testing method is possible. Check valve disassembly is a valuable maintenance tool that can provide a great deal of information about valve internal condition and as such should be performed under the plant maintenance program at a frequency commensurate with the valve type and service.

   The licensee should actively pursue the use of alternate testing methods to full-stroke exercise these valves, such as using non-intrusive diagnostic techniques to demonstrate whether they swing fully open during partial flow testing. When valve operational readiness cannot practicably be determined by observation of system parameters, disassembly and inspection may be used as an alternative, however, the licensee should perform post maintenance testing (e.g., forward and reverse flow closure testing) of each valve prior to returning it to service following the disassembly and inspection procedure. If another method is developed to verify the full-stroke capability of these check valves, the affected relief request should be revised or withdrawn or the affected valves should be removed from the disassembly program.

For the purpose of this report, refueling outage is the plant condition as defined in plant Technical Specifications. For inservice testing purposes, the interval associated with refueling outage testing may be up to 2 years. Relief should be granted provided the licensee's disassembly and inspection program for check valves complies with GL 89-04, Position 2.

7. The licensee has requested relief in RV-28 (See Section 3.1.4.1 of this report) from the corrective action requirements of Section XI for the Category A and A/C containment isolation valves listed in the IST program and proposed to repair or replace these valves as determined by the licensee or when the leakage rate exceeds that as stated in plant Technical Specifications or IWV-3427(a). More information is needed to completely evaluate the licensee's proposal and grant relief as requested. It is not clear whether the licensee has proposed to comply with both PNPS Technical Specification leakage rate requirements and IWV-3427(a) or either. The relief request does not specify what the specified leakage rate limits will be. Relief should be granted provided the licensee tests these valves according to GL 89-04, Position 10.

8. The licensee has requested relief in RV-29 (See Section 3.1.5.2 of this report) from the acceptance criteria requirements of Section XI for power-operated valves with reference stroke times between one and five seconds and proposed to increase the test frequency to monthly when their stroke times deviate by greater than 1.5 x reference time plus one half second. To obtain relief from the Code stroke time acceptance criteria for valves with stroke times in this range the licensee should describe the specific situations where the Code criteria are considered to be excessively burdensome or impracticable and show that their proposed alternative gives adequate assurance of operational readiness. Relief should not be granted as requested.

9. The licensee has requested relief in RV-30 (See Section 3.1.6.1 of this report) from leak testing leakage important valves according to the requirements of Section XI and proposed to perform pressure decay tests utilizing a pressure boundary specified leakage limit. Relief should be granted from the requirements of IWV-3424, -3426 and -3427 provided: (a) valves that can be tested individually are tested in accordance with the Code requirements and (b) maximum group leakage rate limits assigned are based on acceptable leakage through the smallest valve in the group.

10. The licensee has requested relief in RV-26 (See Section 3.2.1.2 of this report) from the test frequency requirements of Section XI for the CRD seal and scram discharge volume drain valves and proposed to measure the closed stroke times and trend this data each refueling outage. The licensee's proposal to stroke time test these valves open quarterly and to trend the results and to stroke time test them closed each refueling outage and to trend those results should give adequate assurance of valve operational readiness and provide a reasonable alternative to the Code requirements for an interim period. Interim relief should be granted as requested until the start of the licensee's next ten-year inservice testing interval. During the interim period the licensee should provide information to justify not testing these valves quarterly or during cold shutdowns. The licensee should show their proposed

alternative provides a reasonable alternative to the Code requirements for assessing valve operational readiness or comply with the Code stroke time requirements in the closed direction for these valves.

11. The licensee has requested relief in RV-09 (See Section 3.2.1.3 of this report) from the test method and frequency requirements of Section XI for the scram inlet and outlet valves and proposed to perform scram functional timing per plant Technical Specifications and to verify individual valve exercise and fail-safe per their described schedule. Relief should be granted provided the licensee complies with GL 89-04, Position 7, for these valves.

12. The licensee has requested relief in RV-09 (See Section 3.2.2.1 of this report) from the test method and frequency requirements of Section XI for the CRD discharge header check and accumulator supply check valves and proposed to verify fail-safe and exercising of valve 114 (and opening of 115) during scram functional testing and to verify closure of 115 each refueling outage. Relief should be granted provided the licensee complies with GL 89-04, Position 7, for testing these valves.

13. The licensee has requested relief in RV-18 (See Section 3.3.3.1 of this report) from the test method requirements of Section XI for the MSIV accumulator air supply check valves and proposed to verify their full-stroke open capability by forward flow exercising them during MSIV full-stroke valve cycle testing. Acceptance criteria is needed to ensure these valves open sufficiently to pass the required flow rate for recharging the MSIV accumulator within the required time. Interim relief should be granted until the start of the licensee's next ten-year inservice testing interval as requested. During this interim period the licensee should either comply with the Code test method requirements or adequately justify an alternate testing method that adequately assesses the operational readiness of these valves and provides a reasonable alternative to the Code requirements.

14. The licensee has requested relief in RV-25 (See Section 3.6.1.1 of this report) from the test method requirements of Section XI for the HPCI system turbine exhaust drain pot isolation valves and proposed to verify valve closure by normal HPCI system operation and by performing local leak rate testing. Interim relief should be granted until start of next 10-year interval while the licensee develops a method of quantitatively evaluating changes in valve condition. During this interim period the licensee should develop a method for quantitatively evaluating changes in valve condition. A method, such as stroke timing, is essential for assessing valve operational readiness. Methods employing magnetics, acoustics, ultrasonics, or other technologies should be investigated for their suitability.

15. The licensee has requested relief in RV-31 (See Section 3.7.1.1 of this report) from the test method requirements of Section XI for the H_2/O_2 analyzer system reagent gas supply valves and proposed to verify valve opening and closure by flow meter indication while operating the analyzer function selector switch. Interim relief should be granted until the start of the next 10-year program interval while the licensee develops a method of quantitatively evaluating changes in the condition of these valves. During this interim period the licensee should develop

a method for quantitatively evaluating changes in valve condition. A method, such as stroke timing, is essential for assessing valve operational readiness. Methods employing magnetics, acoustics, ultrasonics, or other technologies should be investigated for their suitability.

16. Cold shutdown justification CS-03 addresses low pressure coolant injection pressure isolation valves, 68A and 68B, and proposes to part-stroke exercise them with flow during cold shutdowns. These valves are also included in relief request RV-27 (see Section 3.1.3 of this report). The evaluations and recommendations regarding tests for these valves are as stated in the evaluation for that request. Since relief is granted to comply with GL 89-04, Position 2, which addresses the need to part-stroke exercise these valves during cold shutdowns, this cold shutdown justification is not needed and may be deleted.

17. Cold shutdown justifications CS-01, -05, -08, -12, and -13 evaluated in TER Sections 3.8.1.1, 3.3.2.1, 3.8.2.1, 3.3.3.2, and 3.3.1.1 were evaluated as relief requests. The Code allows valves that cannot be exercised during plant operation to be full-stroke exercised during cold shutdowns. The cold shutdown justifications evaluated in this TER do not meet the Code test method or frequency criteria and should be included as relief requests in the next 10-year IST interval program submittal.

18. There is a discrepancy in the pump program in regard to pump P-220; it is not in the IST program pump table but has been included in some relief requests. This discrepancy should be corrected.

19. The licensee identified a test in their IST program designated "AP" for verifying that check valves return to their normal operational positions. This test employs system operational parameters, special testing or valve disassembly. The identified test frequency may be quarterly, but will not exceed refueling outages. These valves may perform a safety function in their normal operational position. The licensee may not consider this testing needed to meet the Code test requirements. Where these valves do not receive the "AP" test quarterly, a cold shutdown justification or relief request, as applicable, should be submitted for review and approval by the NRC. If the affected valves are already included in existing relief requests or cold shutdown justifications, the normal position verification justifications may be added to the applicable relief request or cold shutdown justification. Based on the acceptability of the testing being performed, interim relief should be granted until the start of the next 10-year program interval while the licensee prepares cold shutdown justifications or relief requests where applicable.

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RP-1	2.2.1	IWP-3100: Measure flow rate quarterly	Reactor building closed cooling water pumps, P-202A thru -202F	Measure shutoff head quarterly, measure individual pump flow rate and pressure each refueling.	Provisional Relief Granted (g)(6)(i)
RP-2	N/A	IWP-4310, Table IWP-3100-1, and -3100-2: Measure bearing temperature	All pumps in IST program.	Measure vibration velocity taken at same points as required by Section XI, IWP.	Preapproved GL 89-04, request not evaluated in TER.
RP-3	2.3.1	IWP-3300, -3500, -4600: Measure flow rate, inlet, and differential pressure, test duration	Standby liquid control pumps, P-207A & -207B	Evaluate discharge pressure, verify test tank level to ensure adequate suction pressure, run test for three minutes.	Provisional Relief Granted (a)(3)(i)
RP-4	N/A	IWP-4200: Measure pressure	Salt service water pumps, P-208A thru -208E	Calculate inlet pressure.	Preapproved GL 89-04, request not evaluated in TER.
RP-5	2.4.1	IWP-3100: Measure flow rate quarterly	Salt service water pumps, P-208A thru -208E	Measure shutoff head quarterly, measure pump flow rate and pressure each refueling outage.	Provisional Relief Granted (g)(6)(i)
RP-6	N/A	IWP-4500: Measure vibration amplitude	Salt service water pumps, P-208A thru -208E	Measure vibration at upper motor bearing housing.	Preapproved GL 89-04, request not evaluated in TER.

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RP-7	2.5.1	IWP-4600, Table IWP-4110-1: Measure flow rate, instrument accuracy	Diesel fuel oil transfer pumps, P-141A & -141B	Measure flow rate using survey meter with an accuracy of approximately +/-5%.	Interim Relief Granted (g)(6)(i)
RP-7	2.5.2	IWP-3230(a), -3230(b): Pump hydraulic performance acceptance criteria	Diesel fuel oil transfer pumps, P-141A & -141B	Expand corrective action ranges for flow to 15% degradation for alert range and 25% degradation for required action range.	Interim Relief Granted (a)(3)(ii)
RP-8	2.1.1	IWP-3220: Analyze test results within 96 hours	All pumps in program	Review test data within 96 hours of test excluding weekends and holidays.	Relief Granted (a)(3)(i)
RP-9	2.1.2	IWP-4120: Vibration instrument range requirements	All pumps in program	Measure pump vibration with analog meter with selectable scale, take readings within upper 70% of meter's full scale.	Relief Granted (a)(3)(ii)
RP-10	N/A	Relief request withdrawn by licensee	N/A	N/A	N/A
CS-01	3.8.1.1	IWV-3411: Test frequency	RBCCW to drywell isolation valves, 4009A, 4009B, & 4002	Exercise during cold shutdowns when reactor recirculation pumps are stopped and drywell coolers are not required.	Relief Granted (g)(6)(i)

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
CS-03	Appendix A #16	IWV-3521: Test frequency	Residual heat removal system, 68A and 68B	Part-stroke exercise during cold shutdown not to exceed refueling outage.	None
CS-05	3.3.2.1	IWV-3411, -3412: Test frequency and stroke timing requirements	Reactor recirculation pump discharge valves, 5A & 5B	Exercise during cold shutdowns when the respective reactor recirculation pump is stopped at least each refueling outage.	Relief Granted (g)(6)(i)
CS-08	3.8.2.1	IWV-3411, -3413: Test frequency and stroke timing method	RBCCW loop A isolation valves, 4085A & 4085B	Exercise during cold shutdowns when reactor recirculation pumps are stopped.	Relief Granted (g)(6)(i)
CS-12	3.3.3.2	IWV-3521: Test frequency	Main steam safety/relief discharge line vacuum relief check valves, 96A thru C, 97A thru D, & 98A thru D	Exercise valves open during cold shutdowns when containment is deinerted.	Relief Granted (g)(6)(i)
CS-13	3.3.1.1	IWV-3521: Test frequency	Air accumulator supply valves for ADS valves, 372A thru D	Exercise during cold shutdowns when the drywell is deinerted at least each refueling outage.	Relief Granted (g)(6)(i)
RV-01	N/A	IWV-3521: Test frequency	RBCCW drywell isolation valve, 432	Exercise every two years.	Preapproved GL 89-04, request not evaluated in TER.

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RV-02	N/A	IWV-3521: Test frequency	Nitrogen/ instrument air supply to drywell isolation check valve, 167	Exercise at least every two years.	Preapproved GL 89-04, request not evaluated in TER.
RV-03	N/A	IWV-3420: Leak rate test	Containment atmosphere control vacuum breaker valves, X-201A thru-201K	Leak rate test per plant Technical Specifications.	Preapproved GL 89-04, request not evaluated in TER.
RV-04	N/A	IWV-3417(a): Corrective action	Various rapid-acting power operated valves	Assign 2 second stroke time limit.	Preapproved GL 89-04, request not evaluated in TER.
RV-05	N/A	IWV-3521: Test frequency	TIP system nitrogen purge line isolation valve (no number)	Exercise at least every two years.	Preapproved GL 89-04, request not evaluated in TER.
RV-06	N/A	IWV-3521: Test frequency	Core spray injection isolation check valves, 9A and 9B	Exercise during refueling outages.	Preapproved GL 89-04, request not evaluated in TER.
RV-07	N/A	IWV-3413: Stroke time test	HPCI turbine trip throttle valve, 24	Verify operation by system operability.	Preapproved GL 89-04, request not evaluated in TER.
RV-08	N/A	IWV-3521: Test frequency	SLC injection check valves, 15 &16	Exercise valves each refueling outage.	Preapproved GL 89-04, request not evaluated in TER.

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RV-09	3.2.1.3	IWV-3411, -3413, -3415: Test method and frequency	CRD scram inlet and outlet valves, 126 & 127 (typical)	Perform scram functional timing per plant Technical Specifications.	Provisional Relief Granted (g)(6)(i)
RV-09	3.2.2.1	IWV-3521: Test frequency	CRD discharge header and accumulator supply check valves, 114 & 115 (typical)	Exercise valves 114 and 115 open during scram functional testing, verify closure of valve 115 each refueling outage.	Provisional Relief Granted (g)(6)(i)
RV-10	N/A	IWV-3521: Test frequency	CRD cooling water check valves, 138 (typical)	Exercise via Technical Specification Surveillance requirements.	Preapproved GL 89-04, request not evaluated in TER.
RV-11	N/A	IWV-3411, -3413, -3415: Test method and frequency	Main steam ADS and SRVs, 3A thru 3D	Exercise during refueling outages, do not measure stroke times, verify timely system response.	Preapproved GL 89-04, request not evaluated in TER.
RV-12	N/A	IWV-3421: Test frequency	Feedwater inlet valves, 58A, 58B, 62A, & 62B	Exercise at least every two years.	Preapproved GL 89-04, request not evaluated in TER.
RV-13	N/A	IWV-3521: Test frequency	Recirculation pump seal water system isolation valves, 13A, 13B, 17A & 17B	Exercise at least every two years.	Preapproved GL 89-04, request not evaluated in TER.

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RV-14	N/A	IWV-3412: Test method	Salt service water screen wash isolations, 3915 and 3925	Do not measure stroke times.	Preapproved GL 89-04, request not evaluated in TER.
RV-15	N/A	IWV-3412: Test method	Diesel fuel oil transfer system day tank fill valves, 4521 & 4522	Do not measure stroke times.	Preapproved GL 89-04, request not evaluated in TER.
RV-16	N/A	IWV-3413: Stroke time	RCIC turbine governor valves, 2 (HYD-1301-159)	Verify system operability.	Preapproved GL 89-04, request not evaluated in TER.
RV-17	3.2.1.1	IWV-3411, -3413, -3415: Test method	CRD insertion and withdrawal POVs, 120, 121, 122 & 123 (typical)	Verify operation weekly by notching control rods.	Relief Granted (g)(6)(i)
RV-18	3.3.3.1	IWV-3522(b): Test method	MSIV accumulator air supply check valves, 84A, B, C, D, 85A, B, C, & D	Verify full-stroke open capability by MSIV full-stroke valve cycle testing.	Interim Relief Granted (g)(6)(i)
RV-19	N/A	IWV-3422: Test frequency	Diesel generator air start system valves, 4586A,B, 4587A,B, 4588A,B, 4589A,B, 4569A,B, 4570A,B	Verify operation during monthly diesel start tests, trend diesel start times.	Preapproved GL 89-04, request not evaluated in TER.
RV-20	3.1.1.1	IWV-3521: Test frequency	RHR and core spray system keep fill makeup & pressurization valves, 1001-362B, -363A, 1400-212A, -212B	Part-stroke exercise open quarterly and full-stroke exercise open during each refueling outage, not to exceed two years.	Relief Granted (g)(6)(i)

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

RELIEF REQUEST NUMBER	SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RV-21	3.4.1.1	IWV-3521: Test frequency	RWCU system return flow path to reactor vessel check valve, 81	Exercise closed during leak testing each refueling outage.	Relief Granted (g)(6)(i)
RV-22	3.1.2.1	IWV-3422, -3522: Test frequency	All primary containment isolation excess flow check valves	Exercise and leak rate test each refueling outage.	Relief Granted (g)(6)(i)
RV-23	3.5.1.1	IWV-3521: Test frequency	Emergency diesel generator fuel oil supply check valves, 116A & 116B	Verify full-stroke open during emergency diesel generator testing.	Relief Granted (g)(6)(i)
RV-24	N/A	IWV-3422: Test frequency	Residual heat removal system pressure isolation valves, 63 & 64	Pressure isolation leak test per IWV-3420 each refueling outage.	Relief Granted (g)(6)(i) in NRC SER dated 10/18/89 till refueling outage No. 8, scheduled 3/91. Request not evaluated in TER.
RV-25	3.6.1.1	IWV-3413: Test method	HPCI system turbine exhaust drain pot isolation valves, 9068A & 9068B	Verify closure by system operation and by performing local leak rate testing.	Interim Relief Granted (g)(6)(i)
RV-26	3.2.1.2	IWV-3413: Stroke timing method	CRD scram discharge volume drain valves, 21A, B, 22A, B, 23A, B, 24A & B	Measure the closed stroke times and trend this data each refueling outage.	Interim Relief Granted (g)(6)(i)

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RELIEF REQUEST NUMBER	TER SECTION	SECTION XI REQUIREMENT & SUBJECT	EQUIPMENT IDENTIFICATION	ALTERNATE METHOD OF TESTING	ACTION BY USNRC
RV-27	3.1.3.1	IWV-3522: Test method and frequency	Various check valves identified in the IST program	Disassemble and inspect valves per GL 89-04, Position 2.	Provisional Relief Granted (g)(6)(i)
RV-28	3.1.4.1	IWV-3427(b): Leak testing corrective action requirements	All containment isolation valves	Repair or replace valves as determined by licensee or when leakage rate exceeds plant Technical Specification limit or IWV-3427(a).	Relief Granted (a)(3)(i)
RV-29	3.1.5.1	IWV-3417(a): Corrective action	Various power-operated valves listed in IST program	Compare stroke times against reference stroke times.	Relief Granted (a)(3)(i)
RV-29	3.1.5.2	IWV-3417(a): Stroke time acceptance criteria	POVs with reference stroke times between one and five seconds	Increase test frequency to monthly when stroke times for these valves deviates by greater than 1.5 x reference time plus one half second.	Relief Denied
RV-30	3.1.6.1	IWV-3420: Leak rate testing requirements	All leakage important valves listed in IST program	Perform pressure decay tests utilizing a pressure boundary specified leakage limit.	Provisional Relief Granted (g)(6)(i)
RV-31	3.7.1.1	IWV-3412: Test method	Hydrogen/oxygen analyzer system reagent gas supply valves, 5117A, 5117B, 5137A, & 5137B	Verify valve opening and closure by flow meter indication while operating the analyzer function selector switch.	Interim Relief Granted (g)(6)(i)