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TECHNICAL EVALUATION REPORT
PUMP AND VALVE INSERVICE TESTING PROGRAM
SALEM GENERATING STATION, UNITS 1 AND 2

Docket Nos. 50-272 and 50-311

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ABSTRACT

This report presents the results of our evaluation of relief requests for the Salem Generating Station, Units 1 and 2, 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

This report provides the results of the technical evaluation of certain relief requests from the pump and valve inservice testing (IST) program for Salem Generating Station, Units 1 and 2, submitted by the Public Service Electric and Gas Company. Due to the great similarities between the units, relief requests for identical components in both units are evaluated together.

Section 2 presents the Public Service Electric and Gas Company bases for requesting relief from the requirements for pumps followed by an evaluation and conclusion. Section 3 presents similar information for valves.

Appendix A lists program inconsistencies and omissions, and identifies needed program changes.

1.1 IST Program Description

Public Service Electric and Gas Company submitted Revision 1 of their IST program with a letter to NRC dated June 26, 1987. Revision 2 of their program was sent with a letter to NRC dated October 3, 1989. That program is dated September 25, 1989, and covers the second ten-year IST interval (for Unit 1, the interval is from June 30, 1987 until June 30, 1997). A letter dated February 28, 1990, contained additional information, primarily relief requests, related to the IST program. The February 28, 1990 submittal is superseded by a submittal dated March 14, 1991. An additional submittal dated May 16, 1991, identifies several program changes and includes replacement pages for the program, but contains no relief requests. The licensee's relief requests pertain to requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code), Section XI, 1983 Edition through Summer 1983 Addenda and 10 CFR 50.55a.

1.2 IST Requirements

10 CFR 50.55a(g) states that IST of certain ASME Code Class 1, 2, and 3 pumps and valves will be done per the ASME Code, Section XI, Subsections IWP and IWV, except where relief is granted by NRC in accordance with 10 CFR 50.55a(a)(3)(i), (a)(3)(ii), or (g)(6)(i). The Public Service Electric and Gas Company requests relief from the ASME Code testing requirements for specific pumps and valves. Certain of these requests are evaluated in this Technical Evaluation Report (TER) using the acceptance criteria of the Standard Review Plan, Section 3.9.6, NRC Generic Letter No. 89-04 (GL 89-04), "Guidance on Developing Acceptable Inservice Testing Programs," and 10 CFR 50.55a. Other requests in the licensee's IST program that are not evaluated in this TER, may be granted by provisions of GL 89-04 or addressed in previously issued Safety Evaluations.

1.3 Scope and Limits of the Review

The scope of this review is limited to the relief requests addressed in this TER and the cold shutdown justifications submitted with the licensee's IST program. Other portions of the program, such as general discussions, pump

and valve test tables, etc., are not necessarily reviewed. Endorsement of these aspects of the program by the reviewer or NRC is not stated or implied. Any deviation from the Code test method, frequency, or other requirement should be identified in the IST program and submitted according to 10 CFR 50.55a for review and approval by NRC prior to implementation.

The IST program submittal for valves does not specify the tests that will be performed on each valve. Tests should be done at the required frequencies except where relief is granted. For instance, if full-stroke exercising of a check valve is not practicable quarterly or at cold shutdown a part-stroke exercise should be done. It is assumed for the following evaluations that the part-stroke exercise is done quarterly or at cold shutdown as practicable, except where it is explicitly stated otherwise.

The evaluations in this TER are applicable only to the components or groups of components identified by the submitted requests. These evaluations may not be extended to apply to similar components that are not identified by the request at this or any other comparable facility without separate review and approval by NRC. Further, the evaluations and recommendations are limited to the requirement(s) and/or function(s) explicitly discussed in the applicable TER section. For example, the results of an evaluation of a request involving testing of the containment isolation function of a valve cannot be extended to allow the test to satisfy a requirement to verify the valve's pressure isolation function, unless that extension is explicitly stated.

The Public Service Electric and Gas Company provided several cold shutdown justifications for exercising Category A, B, and C valves during cold shutdowns and refueling outages instead of quarterly. Valves identified to be tested during cold shutdowns need not be tested if testing was performed within three months of the cold shutdown. These justifications were reviewed and found to be acceptable except as noted in Appendix A.

2. PUMP TESTING PROGRAM

The following pump relief requests were evaluated against the requirements of the ASME Code, Section XI, 10 CFR 50.55a, and applicable NRC positions and guidelines. A summary and the licensee's basis for each relief request is presented. The evaluation and recommendation follow. The requests are grouped according to topic or system.

2.1 Chilled Water System

2.1.1 Flow Rate Instrument Accuracy

2.1.1.1 Relief Request. The licensee requests relief from the flow rate instrument accuracy requirements of Section XI, Paragraph IWP-4110, for chilled water pumps 11, 12, 21, and 22. The licensee proposes to use existing flow instruments, which are accurate to ±3%.

2.1.1.1.1 Licensee's Basis for Requesting Relief--At present, flow measurement for the chilled water pumps 11, 12, 21, and 22 is taken using an instrument which is calibrated to an accuracy of 3%. The existing instrumentation is a Fischer Porter rotometer, which can only be calibrated to 3% accuracy. The test flow rate specified in the pump test procedure is the pump design flow. This flow is 18% greater than the system design flow requirements. The additional 1% inaccuracy from the flow meter would reduce the excess flow margin to approximately 17%. The reduction in flow margin will not impact the ability of the pumps to perform the required safety function. Past pump data has been reviewed assuming the larger tolerance. No operability concerns were noted.

Alternate Testing: Use the existing flow instrumentation.

2.1.1.1.2 Evaluation--These pumps provide chilled water to the emergency ventilation system for control room habitability. The installed flow instruments are calibrated to ±3% (the stated percentage accuracy is assumed to be of the indicated value). The licensee proposes to use these instruments for pump testing. This proposal should allow an adequate assessment of pump operational readiness and provide a reasonable alternative to the Code for an interim period of one year or until the next refueling outage, whichever is longer. Immediate compliance with the Code would involve purchasing and installing more accurate instruments. This could require an extended plant outage. That would constitute a hardship for the licensee without a compensating increase in the level of quality and safety for the interim period. However, the licensee has not shown that the proposal provides a reasonable long-term alternative to the Code. More information is needed to fully assess the proposal and grant long-term relief.

Information should be provided to show the long-term acceptability of this proposal. The licensee should describe the in-situ instrument accuracy and repeatability and evaluate the suitability of the acceptance criteria. Though the Code does not define or provide repeatability criteria for instruments, repeatability is an important factor. The use of less accurate instruments with poor repeatability could introduce significant data scatter and reduce the licensee's ability to effectively trend data and detect degradation. The acceptance criteria should also be considered in the light

of the accuracy and repeatability achieved through the test since the ranges of Table IWP-3100-2 might not be appropriate.

The licensee indicated that past test data was reviewed considering the reduced accuracy of the installed instruments and that no operability problems were noted. However, the operability requirements identified in plant Technical Specifications, are typically based on system requirements, such as the minimum rate of cooling flow needed to a cooler. These limits are not intended to evaluate degradation of a specific component and might not be appropriate in that capacity. Therefore, the absence of system operability problems might not indicate satisfactory condition of a pump whose capacity exceeds system requirements.

Based on the determination that the proposal provides a reasonable assurance of operational readiness during the interim period and that immediate compliance with the Code would result in hardship without a compensating increase in the level of safety, interim relief should be granted for one year or until the next refueling outage, whichever is longer. The licensee should develop and provide the information described above to show the proposal adequately assesses pump operational readiness and provides a reasonable alternative to the Code.

2.2 Service Water System

2.2.1 Flow Rate Instrument Accuracy

2.2.1.1 Relief Request. The licensee requests relief from the flow rate instrument accuracy requirements of ASME Section XI, Paragraph IWP-4110, for service water pumps 21, 22, 23, 24, 25, and 26. The licensee proposes to test these pumps using the flow path through the Unit 2 pipe tunnel with instruments accurate to 3%.

2.2.1.1.1 Licensee's Basis for Requesting Relief--At present, flow measurement for the service water pumps is taken using permanently mounted instruments calibrated to an accuracy of 1%. The instrument is a transit-time clamp-on ultrasonic flow meter, manufactured by the Controlotron Corporation. This instrument is located in the service water intake structure. The piping configuration in the Unit 2 intake structure contains elevation changes, elbows, and changes in flow direction which do not allow for a profile to be established which permits accurate flow measurement. Unit 2 service water system has a pipe tunnel with a favorable piping configuration with instrumentation with an accuracy rating of 3%. The most repeatable results of flow measurement can be obtained using instrumentation in Unit 2 pipe tunnel. Past pump data has been reviewed assuming the larger tolerance. No operability concerns were noted.

Alternate Testing: Use flow instrumentation located in the Unit 2 pipe tunnel for IST testing of the service water pumps in order to get more repeatable data.

2.2.1.1.2 Evaluation--The installed flow instruments for these pumps are calibrated to ±1% (the stated percentage accuracy is assumed to be of the indicated value). The licensee proposes to use instruments in the unit 2 pipe tunnel that are more repeatable, but are calibrated to only ±3% for testing. This proposal should allow an adequate assessment of pump operational

readiness and provide a reasonable alternative to the Code for an interim period of one year or until the next refueling outage, whichever is longer. Immediate compliance with the Code would involve purchasing and installing more accurate instruments. This could require an extended plant outage. That would constitute a hardship for the licensee without a compensating increase in the level of quality and safety for the interim period. However, the licensee has not shown that the proposal, to use instruments less accurate than installed, provides a reasonable long-term alternative to the Code. More information is needed to fully assess the proposal and grant long-term relief.

Information should be provided to show the long-term acceptability of this proposal. The licensee should describe and compare the in-situ accuracy and repeatability of the Unit 1 instruments to that of the instruments in the alternate path (Unit 2 pipe tunnel). The suitability of the acceptance criteria should also be considered. Though the Code does not define or provide repeatability criteria for instruments, repeatability is an important factor. The use of less accurate instruments with poor repeatability could introduce significant data scatter and reduce the licensee's ability to effectively trend data and detect degradation. The acceptance criteria should also be considered in the light of the accuracy and repeatability achieved through the test since the ranges of Table IWP-3100-2 might not be appropriate.

The licensee indicated that past test data was reviewed considering the reduced accuracy of the installed instruments and that no operability problems were noted. However, the absence of system operability problems might not indicate satisfactory condition of a pump whose capacity exceeds system requirements. (See related discussion in Section 2.1.1.1.2 of this report.)

Based on the determination that the proposal provides a reasonable assurance of operational readiness during the interim period and that immediate compliance with the Code would result in hardship without a compensating increase in the level of safety, interim relief should be granted for one year or until the next refueling outage, whichever is longer. The licensee should develop and provide the information described above to show the proposal adequately assesses pump operational readiness and provides a reasonable alternative to the Code.

3. VALVE TESTING PROGRAM

The following valve relief requests were evaluated against the requirements of ASME Section XI, 10 CFR 50.55a, and applicable NRC positions and guidelines. A summary is presented for each relief request. This is followed by the licensee's basis for relief and the evaluation with the reviewer's recommendation. They are grouped according to system and Code Category.

3.1 General Valve Relief Requests

3.1.1 Qualification of Test Supervisors

3.1.1.1 Relief Request. The licensee requests relief from the test supervisor qualification requirements of Section XI, Paragraph IWV-3512, for relief valves in the IST program. The licensee proposes to use test supervisors qualified per ANSI 18.1-1971 to perform relief valve operational testing per ASME PTC 25.3, Section 4.09.

3.1.1.1.1 Licensee's Basis for Requesting Relief--The requirements of PTC 25.3 are primarily applicable to manufacturer's testing of new valves. The maintenance activity covered by our test procedures is lift set testing. Only Section 4.09 of PTC 25.3 "Valve Operational Readiness Tests" applies to the testing performed by the Maintenance Department at Salem.

Alternate Testing: Maintenance procedure will only reference Section 4.09 of PTC 25.3. Maintenance supervisor will be qualified in accordance with ANSI 18.1-1971 as committed to in the UFSAR.

3.1.1.1.2 Evaluation--ASME Section XI, Paragraph IWV-3512, requires testing relief valves per ASME Performance Test Code (PTC) 25.3. This Code states that the person who supervises the test shall have obtained a degree in a branch of engineering from a recognized school of engineering. In addition, he shall have at least two years of practical experience in fluid-flow measurement and test supervision. When the testing involves verifying the operational readiness of relief valves, which have previously been qualified for an application at a reactor facility, a degree in engineering may not be necessary. However, supervising relief valve testing can involve technical reviews and evaluations relevant to plant safety. Therefore, the test supervisor should be sufficiently educated and experienced to properly supervise relief valve testing and evaluate test results.

Section 3.02 of an Addendum to PTC 25.3 - 1976, issued in September 1977, reads: "A person who supervises the test shall have a formal education in thermodynamics and fluid mechanics. In addition, he shall have at least two years practical experience in fluid flow measurement and have had experience in test supervision." This Addendum has not been specifically approved for Section XI testing, however, Code Case N-442 indicates that it may be included in all references to PTC 25.3 - 1976 in Section III.

Relief valve testing done per all applicable requirements of PTC 25.3 and supervised by a person that meets the qualification requirements of the 1977 Addendum, should allow an adequate assessment of valve operational readiness. Requiring compliance with the test supervisor qualifications of

PTC 25.3 would be a hardship without a compensating increase in the level of safety.

Based on the determination that compliance with the Code requirements would be a hardship without a compensating increase in the level of quality and safety, and considering that testing supervised by an individual qualified per the 1977 Addendum to PTC 25.3 should provide reasonable assurance of valve operational readiness, relief should be granted from the test supervisor degree requirements for valve operational testing of PTC 25.3, Section 4.09.

3.2 Safety Injection System

3.2.1 Category B Valves

3.2.1.1 Relief Request. The licensee requests relief from the test frequency requirement of Section XI, Paragraph IWV-3300, for verifying remote position indication for safety injection (SI) containment sump suction valves 11SJ44, 12SJ44, 21SJ44, and 22SJ44. The licensee proposes to observe remote position indication every other refueling outage.

3.2.1.1.1 Licensee's Basis for Requesting Relief--These valves are each located in separate compartments in containment. The compartments are accessible from outside containment through four foot diameter manways which must be unbolted and manually removed. These manways are sealed by gaskets in the flange surface to which they are bolted. Proper sealing of this surface is necessary to ensure containment integrity. If the valves are remote position verified every two years, it is possible that the hatch would have to be removed for verification only. In order to minimize damage to flange surfaces and gaskets, valve remote position indication should be verified when other scheduled maintenance/inspection activities are performed.

Alternate Testing: Remote position indication will be verified once every other refueling concurrent with Environmental Qualification (EQ) inspections.

3.2.1.1.2 Evaluation--Section XI, Paragraph IWV-3300, requires that valves with remote position indication be observed at least once every two years to verify that valve operation is accurately indicated. These valves are located in isolated compartments in containment. It is impractical to open these compartments to verify remote position indication accuracy by direct observation every two years. Access to these valves is through large sealed manways equipped with flanges with gasket seals. This seal forms part of the containment boundary. Visual observation of these valves requires breaking these seals and entering the compartment. Disturbing the seals can result in damage to the flange sealing surfaces and the gaskets. Frequent repairs or replacement of these components would be burdensome.

The licensee proposes to observe remote position indication for these valves every other refueling outage. This schedule would act to limit damage to flange surfaces and gaskets. However, if the manways are opened for maintenance or other activities, the position verification test can and should be performed as required. Also, other methods of positively verifying position might be feasible and should be considered. The licensee should actively pursue using alternate methods, such as indications of system pressure or flow, to verify that the position of these valves is accurately

indicated. If an alternate method is found to be feasible, it should be employed at the Code frequency.

Based on the determination that compliance with the Code test frequency for direct observation is impractical and burdensome, and considering the proposed testing, relief should be granted as requested from the Code test frequency requirements. However, whenever the manways are opened, valve position indication should be verified by direct observation.

3.2.2 Category C Valves

3.2.2.1 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for the combined accumulator and RHR injection check valves, 11SJ56 through 14SJ56 and 21SJ56 through 24SJ56. The licensee proposes to full-stroke exercise these valves open each refueling outage.

3.2.2.1.1 Licensee's Basis for Requesting Relief--Flow cannot be established during power operation because the RCS pressure is greater than both the RHR pump shutoff head and accumulator pressure.

Alternate Testing: These valves will be full-stroke exercised during refuelings.

3.2.2.1.2 Evaluation--It is impractical to full- or part-stroke exercise these valves open quarterly during power operation because the only flow path through the valves is into the RCS. Neither the accumulators nor the RHR pumps is capable of overcoming normal operating RCS pressure to establish flow. It is impractical to full-stroke exercise these valves open during cold shutdowns as the RCS does not contain sufficient expansion volume to accept the flow required. Full-stroke exercising during cold shutdowns could cause or contribute to a low-temperature overpressurization of the RCS. However, these valves should be part-stroke exercised at cold shutdowns during RHR cooling operation. System redesign and modification would be necessary to allow full-stroke exercising quarterly or during cold shutdowns. This would be burdensome to the licensee. The proposal to full-stroke exercise these valves each refueling outage, together with part-stroke exercising at cold shutdowns, allows an adequate assessment of valve operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code open exercising requirements is impracticable and burdensome and considering the licensee's proposed alternate testing, relief should be granted from the test frequency requirements as requested.

3.2.2.2 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for the SI check valves to the RCS hot legs, 11SJ139 through 14SJ139 and 21SJ139 through 24SJ139. The licensee proposes to full-stroke exercise these valves open each refueling outage.

3.2.2.2.1 Licensee's Basis for Requesting Relief--During power operation, testing is not possible, since reactor coolant system pressure is greater than safety injection pump shutoff head.

Alternate Testing: These valves will be full stroke exercised during refuelings.

3.2.2.2.2 Evaluation--The only flow path through these valves is into the RCS. It is impractical to full- or part-stroke exercise them open during power operation because the SI pump shutoff head is insufficient to overcome normal operating RCS pressure. It is impractical to full-stroke exercise these valves open during cold shutdowns as the RCS does not contain sufficient expansion volume to accept the flow required. Full-stroke exercising during cold shutdowns could cause or contribute to a low-temperature overpressurization of the RCS. Administrative controls to prevent low-temperature overpressurization may preclude even a part-stroke exercise of these valves during cold shutdowns. System redesign and modification would be necessary to allow full-stroke exercising quarterly or during cold shutdowns. This would be burdensome to the licensee. The proposal to full-stroke exercise these valves each refueling outage allows an adequate assessment of valve operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed alternate testing, relief should be granted from the test frequency requirements for full-stroke exercising as requested.

3.2.2.3 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for SI check valves to the RCS cold legs, 11SJ144 through 14SJ144 and 21SJ144 through 24SJ144. The licensee proposes to full-stroke exercise these valves open each refueling outage.

3.2.2.3.1 Licensee's Basis for Requesting Relief--During power operation, testing is not possible, since RCS pressure is greater than SI pump shutoff head.

Alternate Testing: These valves will be full-stroke exercised during refuelings.

3.2.2.3.2 Evaluation--The only flow path through these valves is into the RCS. It is impractical to full- or part-stroke exercise them open during power operation because the SI pump shutoff head is insufficient to overcome normal operating RCS pressure. It is impractical to full-stroke exercise these valves during cold shutdowns as the RCS does not contain sufficient expansion volume to accept the flow required. Full-stroke exercising open during cold shutdowns could cause or contribute to a low-temperature overpressurization of the RCS. Administrative controls to prevent low-temperature overpressurization may preclude even a part-stroke exercise of these valves during cold shutdowns. System redesign and modification would be necessary to allow full-stroke exercising quarterly or during cold shutdowns. This would be burdensome to the licensee. The proposal to full-stroke exercise these valves each refueling outage allows an adequate assessment of valve operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed alternate

testing, relief should be granted from the test frequency requirements for full-stroke exercising open as requested.

3.2.2.4 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for the accumulator discharge check valves, 11SJ55 through 14SJ55 and 21SJ55 through 24SJ55. The licensee proposes to full-stroke exercise these valves open during refueling outages.

3.2.2.4.1 Licensee's Basis for Requesting Relief--During power operation, the RCS pressure is greater than accumulator pressure.

Alternate Testing: These valves will be full-stroke exercised during refuelings.

3.2.2.4.2 Evaluation--It is impractical to full- or part-stroke exercise these valves open during power operation because the only flow path is into the RCS. The operating accumulator pressure cannot overcome normal operating RCS pressure to establish flow. It is impractical to full-stroke exercise these valves open during cold shutdowns because the RCS does not contain sufficient expansion volume to accept the flow required. However, it may be practical to part-stroke exercise these valves open going into cold shutdown by dropping RCS pressure slightly below accumulator pressure prior to closing the accumulator isolation valves. The licensee should investigate accumulator burping to part-stroke exercise these valves during cold shutdowns and either implement this testing or document the reason it is impractical in the IST program. System redesign and modification would be necessary to allow full-stroke exercising quarterly or during cold shutdowns. This would be burdensome to the licensee. The proposal to full-stroke exercise these valves open each refueling outage provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code requirements is impractical and burdensome, and considering the licensee's proposal, relief should be granted from the Code test frequency requirements with the following provision. The licensee should investigate accumulator burping to part-stoke exercise these valves open during cold shutdowns and either implement this testing or document the reason it is impractical in the IST program.

3.3 Component Cooling System

3.3.1 Category C Valves

3.3.1.1 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for closure testing the component cooling water supply to reactor coolant pump (RCP) check valves, 11CC128 through 14CC128 and 21CC128 through 24CC128. The licensee proposes to exercise these valves closed each refueling outage.

3.3.1.1.1 Licensee's Basis for Requesting Relief--These valves cannot be exercised closed during power operations because component cooling flow to the RCP thermal barrier would be lost.

Alternate Testing: These valves will be exercised to the closed position during refueling after the component cooling system has been dechromated to

minimize the health hazards to the individuals performing the test and to protect the RCPs.

3.3.1.1.2 Evaluation--These check valves provide cooling water flow to the RCP thermal barriers. It is impractical to exercise them closed quarterly during power operations, because containment entry is required to perform the back flow test. Containment entry is restricted during power operation due to personnel safety hazards and high radiation levels. It is also impractical to exercise these valves closed at anytime the RCS temperatures are elevated because loss of cooling flow could result in damage to the RCP seals. A reverse flow closure test requires stopping cooling flow to the RCPs and draining and flushing the system to remove the chromated water, which is a personnel health and environmental hazard. Performing this testing at cold shutdown would likely result in a delay of plant startup. This would be burdensome to the licensee.

The licensee's proposal to exercise these valves closed per the Code method during refueling outages allows an adequate assessment of operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code test frequency requirements is impracticable and burdensome, and considering the proposed alternate testing frequency, relief should be granted as requested.

3.4 Emergency Core Cooling Systems

3.4.1 Category A/C Valves

3.4.1.1 Relief Request. The licensee requests relief from the test method and frequency requirements of Section XI, Paragraph IWV-3520, for emergency core cooling system (ECCS) relief valve discharge line check valves, 1PR25 and 2PR25. The licensee proposes to part-stroke exercise these valves open quarterly and to disassemble, inspect, manually full-stroke exercise, and leak rate test them during refueling outages.

3.4.1.1.1 Licensee's Basis for Requesting Relief--These valves can not be full flow tested in the forward direction due to the size of the test connection. These valves cannot be reverse flow tested during power operation because a blank flange must be installed which renders ECCS relief valves inoperable.

Alternate Testing: A partial exercise test will be performed in the forward direction due to the size of test connection. The valves will also be periodically disassembled to comply with item 2 of Generic Letter 89-04. These valves will be exercise tested in the reverse direction during refueling local leak rate testing.

3.4.1.1.2 Evaluation--These valves are located on the discharge lines for the ECCS relief valves and serve as containment isolation valves. It is impractical to full-stroke exercise them with flow during any plant mode because achieving maximum required accident flow would involve lifting several relief valves simultaneously which would be extremely difficult and could cause equipment damage. The test connections are too small (3/4 inch lines) to permit sufficient flow to qualify as a full-stroke exercise per GL 89-04.

Significant system modifications would be necessary to permit compliance with the Code requirements. It would be burdensome to require the licensee to make these modifications because of the costs involved.

It is impractical to reverse flow test these valves during power operation because a blank flange must be installed in the line between these valves and the pressurizer relief tank. A containment entry is required to install the blank flange and the flange renders all ECCS relief valves inoperable. Performing this testing is a time consuming evolution which could delay the return to power if done at cold shutdowns. Verifying the valve reverse flow closure capability in conjunction with the Appendix J leak rate testing at refueling outages should provide reasonable assurance of valve operational readiness for its closed safety function.

The licensee proposes to disassemble and inspect these valves periodically per GL 89-04, Position 2. 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 as a substitute for testing only when testing with pressure or flow 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 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 maintenance program at a frequency commensurate with the valve type and service.

The licensee's proposed disassembly and inspection program is not thoroughly described in the IST program. Therefore, a determination that the proposal provides a reasonable alternative to the Code requirements cannot be made. However, a check valve inspection program performed in accordance with Position 2 can adequately determine valve condition and provides a reasonable alternative to the Code requirements. To comply with this generic letter position, one of these valves must be disassembled each refueling outage unless the conditions specified in GL 89-04 for extension of the inspection interval are met.

The licensee should actively pursue the use of alternate testing methods to verify valve full-stroke open, such as using non-intrusive diagnostic techniques to demonstrate that these valves fully open when subjected to a partial flow test. If the licensee's investigation shows that there are no feasible testing methods for these valves, disassembly and inspection may be used as an alternative. The minutes of the public meetings on GL 89-04 stipulate that a part-stroke exercise test using flow is expected to be performed after disassembly and inspection is completed but before the valve is returned to service. If disassembly is used in lieu of testing, the licensee should develop and implement a method to part-stroke exercise and leak rate test these valves following reassembly.

Based on the determination that compliance with the Code requirements is impractical and burdensome, and considering the licensee's proposed testing, relief should be granted with the following provision. The licensee should develop and implement post maintenance testing of reassembled valves.

3.5 Reactor Coolant System

3.5.1 Category B Valves

3.5.1.1 Relief Request. The licensee requests relief from the test frequency and remote position verification requirements of Section XI, Paragraphs IWV-3410 and -3300, for the reactor head vent valves, 1RC40, 41, 42, 43 and 2RC40, 41, 42, 43. The licensee proposes to exercise these valves during refueling outages, but has not proposed an alternate method to verify valve remote position indication.

3.5.1.1.1 Licensee's Basis for Requesting Relief--(A): A letter from Mr. Steve Varga (Operating Reactor Branch 1, Division of Licensing), dated September 27, 1983 to Mr. R. A. Uderitz (Vice President Nuclear). Technical Specification surveillance requirements 4.4.12.1, 4.4.12.2, and 4.4.12.3. (B): Remote position verification cannot be performed due to no local valve position indication.

Alternate Testing: (A): These valves will be exercised during refueling in accordance with technical specification surveillance requirements 4.4.12.1, 4.4.12.2, and 4.4.12.3. (B): None.

3.5.1.1.2 Evaluation--These solenoid valves are installed with two valves in series in each path. It is impractical to exercise these valves during power operation, hot standby, or hot shutdown because the valve design and installation is such that testing of either series valve can cause "burping" (momentary opening) of the second valve. This burping action results in the release of radioactive fluid and creates an airborne radioactivity and surface contamination problem in containment.

The licensee has not provided an adequate technical justification for not performing the Code required testing during cold shutdowns. Any coolant discharged during cold shutdown testing, if "burping" occurred, could be collected in containers. With the low RCS pressures and temperatures experienced during cold shutdowns and the rapid stroke times of these solenoid valves there would be little, if any, coolant discharge. Inconvenience is not a sufficient justification for deviation from Code requirements.

The licensee has not provided an adequate technical justification for not performing the required stroke time measurements. These are small solenoid actuated valves that normally stroke very rapidly. Because of the difficulty in accurately measuring these extremely short stroke times and since there is no direct means to determine when the valves have changed position, it would be impractical to trend the stroke times of these valves. Position 6 of GL 89-04 grants relief from trending stroke times for rapid acting valves. However, the proposed testing does not provide a means to monitor for valve degradation. Therefore, the licensee should develop and implement a method to test these valves that monitors valve condition and can detect degradation. Requiring the licensee to immediately develop and implement an alternate test method would be a hardship without a compensating increase in the level of quality and safety. Therefore, an interim period of one year or until the next refueling outage, which ever is longer, should be provided for the licensee to develop and implement this testing.

These valves are totally enclosed and have no local position indication, therefore, it is impractical to directly verify remote valve position indication. However, it is not acceptable to not periodically verify that the indication used by plant operators accurately reflects valve position. A positive means should be developed and implemented to verify indication accuracy. It would be burdensome to require immediate compliance, therefore, an interim period should be provided for the licensee to develop and implement testing. While the licensee's proposal is not acceptable for the long term, it should allow an adequate assessment of operational readiness during the interim period. The licensee should actively pursue the use of alternate methods to verify valve position such as radiography or acoustics.

Based on the determination that the licensee has not provided an adequate justification for not performing the Code required testing at cold shutdown, relief should not be granted from the test frequency requirements. Based on the determination that immediate compliance with the Code would be a hardship without a compensating increase in the level of safety and considering the licensee's proposal, interim relief should be granted for one year or until the next refueling outage, whichever is longer, to develop and implement a method of stroke timing or otherwise evaluating valve condition and for verifying remote position indication.

3.6 Chemical and Volume Control System

3.6.1 Category C Valves

3.6.1.1 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, IWV-3521, for the refueling water storage tank (RWST) to charging pump suction check valves, 1SJ3 and 2SJ3. The licensee proposes to full-stroke exercise these valves with flow and verify closure by radiography during refueling outages.

3.6.1.1.1 Licensee's Basis for Requesting Relief--These valves cannot be exercised during power operation because 2300 ppm boron would be injected into the RCS.

Alternate Testing: This valve will be full flow tested during refueling and radiographed after full flow testing, once the volume control tank has been pressurized, to verify the valve has reseated.

3.6.1.1.2 Evaluation--These check valves prevent backflow from the volume control system into the RWST. It is impractical to full-stroke exercise them during power operation because 2300 ppm boron would be injected into the RCS. This would result in a large negative reactivity insertion and possibly a reactor shutdown. To allow full-stroke exercising of these valves quarterly would require system redesign and modifications. This would be burdensome to the licensee. However, the licensee has not adequately demonstrated the impracticality or hardship of exercising these valves during cold shutdowns. The plant boron concentration is routinely increased going into the cold shutdown mode, therefore, it may be practical to full-stoke exercise these valves open with flow during this plant evolution. Closure verification using radiography does not appear to be plant mode sensitive, therefore, it may be practical to verify valve closure following valve exercising on a cold shutdown frequency.

Requiring the licensee to immediately develop and implement procedures to exercise these valves at the Code specified frequency would be a hardship without a compensating increase in the level of quality and safety. Therefore, an interim period, should be provided. While not acceptable for the long term, the proposed testing should allow an adequate assessment of valve operational readiness in the interim period.

Based on the determination that immediate compliance with the Code requirements would be a hardship without a compensating increase in the level of quality and safety and considering the proposed testing, interim relief should be granted for one year or until the next refueling outage, whichever is longer.

3.7 Residual Heat Removal System

3.7.1 Category C Valves

3.7.1.1 Relief Request. The licensee requests relief from the test frequency requirements of Section XI, Paragraph IWV-3521, for the RHR pump suction check valves from the RWST, 1SJ70 and 2SJ70. The licensee proposes to full-stroke exercise these valves each refueling outage.

3.7.1.1.1 Licensee's Basis for Requesting Relief--These valves can only be full-stroke exercised during cavity fill. During power operation maximum RHR pump flow on recirculation is 500 gpm from discharge of pump to suction of pump. Flow through 1SJ70 and 2SJ70 would be minimal.

Alternate Testing: These valves will be full stroke exercised during refuelings.

3.7.1.1.2 Evaluation--These check valves prevent backflow from the RHR pump suction to the RWST. The only full flow path through these valves discharges into the RCS. It is impractical to full-stroke exercise them open quarterly during power operation because the RHR pumps do not produce sufficient head to overcome normal operating RCS pressure. It is impractical to full-stroke exercise them with flow during cold shutdowns because it would require pumping water from the RWST into the RCS. Pumping from the RWST would inject water with a high concentration of boric acid which would overborate the RCS. The excess boron would have to be removed prior to returning the plant to power, which would result in the creation of a substantial quantity of radioactive waste water and could delay the return to power. System redesign and modification would be necessary to allow full-stroke exercising quarterly or during cold shutdowns. This would be burdensome to the licensee. The proposal to full-stroke exercise these valves open each refueling outage allows an adequate assessment of valve operational readiness and provides a reasonable alternative to the Code test frequency requirements.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed alternate testing, relief should be granted from the Code requirements for full-stroke exercising open as requested.

3.8 Service Water System

3.8.1 Category C Valves

3.8.1.1 Relief Request. The licensee requests relief from the exercising method and frequency requirements of Section XI, Paragraph IWV-3520, for the service water supply to the turbine generator check valves, 11SW5, 13SW5, 21SW5, and 23SW5. The licensee proposes to sample disassemble and inspect one of these valves, for the affected unit, during each refueling outage.

3.8.1.1.1 Licensee's Basis for Requesting Relief--A method of verifying these valves closed other than inspection is not available.

Alternate Testing: These valves will be inspected during refuelings with one of the two valves for each unit being disassembled and inspected each refueling.

3.8.1.1.2 Evaluation--Valves 11SW5, 13SW5, 21SW5, and 23SW5 are simple check valves without local or remote position indication. These valves cannot be verified to close by leak testing or observation of differential pressure in the reverse flow direction because the necessary isolation valves and test taps are not available. Significant system redesign and modification would be necessary to allow verification of valve closure using system pressure or flow measurements. It would be burdensome to require the licensee to perform these system modifications due to the expense involved. Disassembly and inspection may be the only practical method available to verify valve reverse flow closure capability.

The licensee proposes to disassemble and inspect these valves each refueling outage. 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 as a substitute for testing only when testing with pressure or flow 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 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 maintenance program at a frequency commensurate with the valve type and service.

The licensee's proposed disassembly and inspection program is not thoroughly described in the IST program. Therefore, a determination that the proposal provides a reasonable alternative to the Code requirements cannot be made. However, a check valve inspection program performed in accordance with GL 89-04, Position 2, can adequately determine valve condition and provides a reasonable alternative to the Code requirements.

The licensee should actively pursue the use of alternate testing methods to verify valve closure, such as using non-intrusive diagnostic techniques to demonstrate that these valves will close when subjected to reverse differential pressure. If the licensee finds no feasible testing methods for these valves, disassembly and inspection may be used as an alternative.

Position 2 stipulates that a part-stroke exercise test using flow should be performed after disassembly and inspection is completed but before the valve is returned to service. If disassembly is used in lieu of testing, the licensee should develop and implement a method to part-stroke exercise these valves following reassembly.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed testing, relief should be granted with the following provision. The licensee should perform check valve disassembly and inspection in accordance with the positions of GL 89-04, including post maintenance testing of reassembled valves.

3.8.1.2 Relief Request. The licensee requests relief from the exercising requirements of Section XI, Paragraph IWV-3520, for the service water supply check valves to the nuclear header, 12SW5, 14SW5, 22SW5, and 24SW5. The licensee proposes to part-stroke exercise these valves quarterly and to sample disassemble and inspect one valve (for the shutdown unit) each refueling outage.

3.8.1.2.1 Licensee's Basis for Requesting Relief--These valves cannot be exercised open without subjecting the system to a significant transient and erosion. An adequate means for testing the valve closed is not available.

Alternate Testing: These valves will be part stroke exercised every 90 days. One of these valves, in each unit, will be disassembled and inspected every refueling.

3.8.1.2.2 Evaluation--Valves 12SW5, 14SW5, 22SW5, and 24SW5 are simple check valves without local or remote position indication. It is impractical to full-stroke exercise them open with flow because it would involve increasing cooling flow to the served heat loads, which could cause significant thermal stress to some of these components. These valves cannot be verified to close by leak testing or observation of differential pressure in the reverse flow direction because the necessary isolation valves and test taps are not available. Significant system redesign and modification would be necessary to allow a full-stroke exercise open or verification of valve closure using system pressure or flow measurements. It would be burdensome to require the licensee to perform these system modifications due to the expense involved. Disassembly and inspection may be the only practical method available to verify valve full-stroke open and reverse closure capability.

The licensee proposes to part-stroke exercise these valves quarterly and disassemble and inspect them each refueling outage. 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 as a substitute for testing only when testing with pressure or flow is impractical.

The licensee's proposed disassembly and inspection program is not thoroughly described in the IST program and cannot be fully evaluated. However, a check valve inspection program performed in accordance with GL 89-04, Position 2, can adequately determine valve condition and provides a reasonable alternative to the Code requirements.

The licensee should actively pursue the use of alternate testing methods to verify valve closure, such as using non-intrusive diagnostic techniques to demonstrate that these valves close when subjected to reverse differential pressure. If no feasible testing methods can be identified for these valves, disassembly and inspection may be used as an alternative. Position 2 also stipulates that a part-stroke exercise test using flow is expected to be performed after disassembly and inspection is completed but before the valve is returned to service. If disassembly is used for testing, the licensee should develop and implement a method to part-stroke exercise these valves following reassembly.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed testing, relief should be granted with the following provision. The licensee should perform check valve disassembly and inspection in accordance with the positions of GL 89-04, including post maintenance testing of reassembled valves.

3.8.1.3 Relief Request. The licensee requests relief from the full-stroke exercising method and test frequency requirements of Section XI, Paragraph IWV-3520, for the service water overload discharge check valves, 11SW79, 12SW79, 21SW79, and 22SW79. The licensee proposes to part-stroke exercise these valves quarterly and to inspect them during each cold shutdown.

3.8.1.3.1 Licensee's Basis for Requesting Relief--These valves cannot be exercised closed without isolating the service water system discharge path. A method of verifying them closed, other than inspection, is not available. These valves cannot be full-stroked open without subjecting the system to an extreme transient and erosion condition.

Alternate Testing: These valves will be partially stroked every 90 days. These valves will be inspected during cold shutdown per Section XI. In cases of frequent cold shutdowns, these valves need not be inspected more often than once every three months.

3.8.1.3.2 Evaluation--These are simple, 24" diameter check valves without local or remote position indication. They will be verified to part-stroke exercise open quarterly. Full-stroke exercising these valves with the maximum required accident condition flow rate is impractical since it could result in damage to the system components, particularly from erosion. However, some method must be used to adequately assess the operational readiness of these valves as required by the Code.

The licensee has not proposed to full-stroke exercise these valves open at any frequency, therefore long term relief cannot be granted. Positions 1 and 2 of GL 89-04 describe two methods for determining valve condition, flow testing and disassembly and inspection, respectively. A check valve inspection program performed in accordance with GL 89-04, Position 2, can adequately determine valve condition and provides a reasonable alternative to the Code requirements for the open position. In the near term, these valves should be disassembled and inspected each refueling outage according to Position 2, to verify their full-stroke open capability. However, disassembly and inspection should be used as a substitute for testing only when testing with pressure or flow 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 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 maintenance program at a frequency commensurate with the valve type and service.

If the licensee cannot verify a full-stroke open exercise test with the accident flow rate, then other testing methods should be considered. The licensee should actively pursue the use of alternate testing methods to verify valve full-stroke open, such as using non-intrusive diagnostic techniques to demonstrate that these valves fully open when subjected to a low flow test. If the licensee's investigation shows that there are no feasible testing methods for these valves, disassembly and inspection according to Position 2 may be used as an alternative.

These valves cannot be verified to close by leak testing or observing reverse differential pressure due to the lack of appropriate isolation valves and test taps. System redesign and modification would be necessary to allow verification of valve closure quarterly using system pressure or flow measurements. It would be burdensome to require the licensee to perform these system modifications due to the expense involved. Disassembly and inspection may be the only practical method available to verify valve reverse flow closure capability.

The licensee should actively pursue the use of alternate testing methods to verify valve closure, such as using non-intrusive diagnostic techniques to demonstrate that these valves will close when forward flow is stopped or when the valves are subjected to reverse differential pressure. If the licensee's investigation shows that there are no feasible testing methods for these valves, disassembly and inspection may be used as an alternative.

The licensee proposes to inspect these valves at cold shutdown. However, the inspection technique has not been described and cannot be evaluated to determine whether it is a suitable alternative to the Code requirements for either closure or open exercising.

Based on the determination that compliance with the Code requirements is impractical and burdensome and considering the licensee's proposed testing, long term relief should not be granted. Interim relief should be granted for one year or until the next refueling outage, whichever is longer, with the following provisions. The licensee should continue to part-stroke exercise these valves open with flow quarterly and inspect these valves during cold shutdowns. In addition, the licensee should actively pursue alternate techniques for testing these valves and perform disassembly and inspection according to GL 89-04, Position 2, each refueling outage.

APPENDIX A
IST PROGRAM ANOMALIES

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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 requests relief from the instrument accuracy requirements for auxiliary feedwater pumps 11, 12 13 and boric acid transfer pumps 11 and 12 for flow measurement and proposes to measure flow with existing instrumentation until December 31, 1991, and May 31, 1991, respectively, at which time new flow instrumentation will be installed. Since these dates have passed and the licensee committed to notify the NRC that the relief request is no longer required after installation of the new instrumentation, these relief requests may be withdrawn. If relief is still needed as a result of the new flow instrumentation not being installed or for any other reason the requests should be revised and resubmitted.

2. The licensee requests relief from the flow rate instrument accuracy requirements for chilled water pumps 11, 12, 21, and 22 (see Section 2.1.1.1 of this report) and proposes to use existing flow instrumentation. The licensee has not shown that the proposal provides a reasonable long-term alternative to the Code. More information is needed to fully assess the proposal and grant long-term relief. The licensee should describe the in-situ instrument accuracy and repeatability and evaluate the suitability of the acceptance criteria. Interim relief should be granted for one year or until the next refueling outage, whichever is longer. The licensee should develop and provide the information described above to show the proposal adequately assesses pump operational readiness and provides a reasonable alternative to the Code.

3. The licensee requests relief from the flow rate instrument accuracy requirements for service water pumps 21, 22, 23, 24, 25, and 26 (see Section 2.2.1.1 of this report) and proposes to test these pumps using the flow path through the Unit 2 pipe tunnel. Interim relief should be granted for one year or until the next refueling outage whichever is longer. During this interim period the licensee should actively pursue the installation of instrumentation or other methods of complying with the Code accuracy requirements. If compliance is impracticable, the licensee should submit additional information that supports this determination.

4. The licensee requests relief from the qualification requirements for test supervisors, i.e., an engineering degree and experience in fluid flow measurements (see Section 3.1.1.1 of this report). The licensee proposes to use a maintenance supervisor that is qualified in accordance with the requirements of ANSI 18.1-1971 to perform this function. Relief should be granted from the engineering degree requirements for supervisors observing operational testing of relief valves per ASME PTC 25.3, Section 4.09, provided the test supervisor meets the requirements of Section 3.02 of the September, 1977 Addendum to PTC 25.3-1976.

5. The licensee requests relief from the requirement of observing remote position indication accuracy for safety injection valves 11SJ44, 12SJ44, 21SJ44, and 22SJ44 every two years (see Section 3.2.1.1 of this report) and proposes to observe remote position indication every other refueling outage. Relief should be granted as requested from the Code test frequency. However, if these manways are opened for any reason, the remote valve position indication should be directly observed at that time. If feasible, alternate indirect methods should be used at the Code specified frequency.

6. The licensee requests relief from the test frequency requirements for the accumulator discharge check valves (see Section 3.2.2.4 of this report) and proposes to full-stroke exercise them during refuelings. Relief should be granted from the Code test frequency requirements provided the licensee investigates accumulator burping to part-stoke exercise these valves during cold shutdowns and either implements this testing or documents why it is impractical in the IST program.

7. The licensee requests relief from the test frequency requirements of exercising the emergency core cooling system relief valve discharge header check valves, 1PR25 and 2PR25, (see Section 3.4.1.1 of this report) and proposes to part-stroke exercise them quarterly and periodically disassemble and inspect them per GL 89-04, Position 2. Relief should be granted provided the licensee performs post-maintenance testing of reassembled valves.

8. The licensee requests relief from the test frequency and remote position verification requirements for the reactor head vent valves (see section 3.5.1.1 of this report). The licensee proposes to exercise these valves during refueling outages, but has not proposed an alternate method to verify valve remote position indication nor provided an adequate technical justification for not performing the Code required testing at a cold shutdown frequency. Relief should not be granted from the test frequency requirements as the licensee has not provided an adequate justification for not performing the Code required testing at cold shutdown. However, interim relief should be granted for one year or until the next refueling outage whichever is longer, for stroke time measurement and remote position verification.

9. The licensee requests relief from the test frequency requirements for the refueling water storage tank to charging pump suction check valves (see section 3.6.1.1 of this report). The licensee proposes to full-stroke exercise these valves with flow and verify closure by radiography during refueling outages. The licensee has not adequately demonstrated the impracticality or hardship of exercising these valves during cold shutdowns, therefore, long term relief should not be granted. Interim relief should be granted for one year or until the next refueling outage, whichever is longer. During this period, the licensee should develop and implement testing at a cold shutdown frequency or justify an extended interval in a request for relief.

10. The licensee requests relief from the exercising requirements for the service water supply to the turbine generator check valves (see Section 3.8.1.1 of this report) and proposes to sample disassemble and inspect one of these valves, for the affected unit, during each refueling

outage. Relief should be granted with the provision that the licensee performs check valve disassembly and inspection in accordance with the positions of GL 89-04, including post maintenance testing of reassembled valves.

11. The licensee requests relief from exercising the service water supply check valves to the nuclear header at least once every three months (see Section 3.8.1.2 of this report) and proposes to part-stroke exercise these valves every 90 days and disassemble and inspect one of these valves each refueling outage. Relief should be granted provided the licensee performs check valve disassembly and inspection in accordance with the positions of GL 89-04, including post maintenance testing of reassembled valves.

12. The relief requests in the Salem 1 and 2 IST programs do not have unique identifiers. With the current system, it is necessary to identify both the submittal and the components for which relief is requested to refer to a particular relief request. Each relief request should be uniquely identified in subsequent submittals.

13. The "Function" paragraph in the relief requests for the ECCS injection check valves (see Sections 3.2.2.1, 3.2.2.2, 3.2.2.3, and 3.2.2.4 of this TER) provides the system function for the valves but does not indicate their safety-related function(s). These valves perform safety functions in both the open (to permit ECCS flow into the RCS) and the closed (to prevent loss of RCS inventory and overpressurization of low pressure piping and components) positions. These check valves must be full-stroke exercised open per GL 89-04, Position 2, and back flow and leak rate tested per GL 89-04, Positions 3 and 4. The licensee's bases for relief in these requests address the reasons that it is impractical to full-stroke exercise these valves open during power operations. Their bases do not address the back flow or leak rate testing of these check valves. Therefore, it is assumed that these relief requests are for the open exercise testing and do not apply to the back flow or leak rate testing of the affected valves. The evaluations and recommendations of this TER pertain only to open exercise testing, therefore, the recommended granting of relief does not apply to the back flow or the leak rate testing requirements of the Code.

    The licensee must back flow test these valves quarterly, if practical, or at cold shutdowns and leak rate test them every two years in accordance with the Code unless relief is specifically requested and granted from the applicable requirements. If these requests are intended to apply to test requirements other than the open exercise, this should be clearly stated in each request and an adequate technical basis provided that demonstrates the impracticality of the testing or that compliance would constitute a hardship without a compensating increase in the level of quality and safety.

    The above discussion is also applicable to valves 1SJ3, 2SJ3, 1SJ70, and 2SJ70 (see Sections 3.6.1.1 and 3.7.1.1 of this TER), which are Category C instead of A/C. The same assumptions and conclusions apply to them as the others, except that they are not required to be leak rate tested.

14. All of the licensee's discussions regarding extended frequencies of testing are presented in the submittal as relief requests. However, many propose to test at the Code allowed frequency i.e., during cold shutdowns. These discussions are not truly requests for relief because the Code test frequency requirements will be met. The licensee should change the titles of these cold shutdown test frequency justifications in future program submittals.

15. Section XI requires performance of certain valve tests quarterly if practical, or during cold shutdowns. When testing at either of these Code specified frequencies is impractical or constitutes a hardship without a compensating increase in the level of quality and safety, relief may be requested and granted per the provisions of 10 CFR 50.55a. Many of the relief requests from the Code test frequency requirements in the Salem IST program, provide a basis for not performing required testing quarterly during power operations and propose to test during refueling outages. However, these requests do not address the other Code specified frequency - cold shutdowns. If cold shutdown testing of these valves is impractical or constitutes a hardship without a compensating increase in the level of quality and safety, a technical justification demonstrating this case should be provided in the relief request.

    The licensee should evaluate all applicable valve relief requests to ensure that adequate bases are provided for not testing at the cold shutdown frequency. If a request does not contain an adequate basis, the licensee should either revise and resubmit it for review and approval or test the valves during cold shutdowns and withdraw the relief request.

16. The licensee requests relief from the test frequency requirements for fuel oil engine driven booster pumps, 21, 22, and 23. The request is in Appendix B, of the IST program submittal for Unit 2, on page 2 of 5. The basis for relief section of that request is obviously missing some text. For this report the missing text is assumed to be the same as that in the Unit 1 request. This request should be revised as part of a future program update.

17. The IST program does not include a description of how the components were selected and how testing requirements were identified for each component. The review performed for this Safety Evaluation (SE)/TER did not include verification that all pumps and valves within the scope of 20 CFR 50.55a and Section XI are contained in the IST program, and did not ensure that all applicable testing requirements have been identified. Therefore, the licensee is requested to include this information in the IST program. The program should describe the development process, such as a listing of the documents used, the method of determining the selection of components, the basis for the testing required, the basis for categorizing valves, and the method or process used for maintaining the program current with design modifications or other activities performed under 10 CFR 50.59.

18. The licensee requests relief from the Code test frequency requirements for exercising and fail-safe testing the containment purge containment isolation valves 1VC2, 1VC3, 2VC2, and 2VC3. The licensee's relief

request is divided into two parts. This discussion is limited to part A. For Unit 1 the licensee proposes to stroke time and fail-safe test valves 1VC2 and 1VC3 whenever they are operable. The licensee proposes to test Unit 2 valves 2VC2 and 2VC3 whenever they are operated. The proposed test frequency is not clear and inconsistent between the Units and should be stated clearly in a program revision.

19. The licensee requests relief from Code test frequency requirements for exercising and fail-safe testing the containment purge containment isolation valves 1VC1, 1VC4, 2VC1, and 2VC4. The licensee proposes to test these valves whenever they are operated. A maximum test interval, such as once every two years or each refueling outage is not specified. Additionally, the licensee has not provided a basis for extending the test interval for these valves beyond that allowed by the Code, which is quarterly or if that is impractical, during cold shutdowns. The proposed test frequency is not clear. If these valves are operated and tested each cold shutdown, relief is not needed (a cold shutdown justification would suffice). If these valves are to be tested only during cold shutdowns when certain conditions are met and each refueling outage, then relief is needed and the basis for the extended interval and the proposed alternate testing frequency should be stated clearly in a program revision.