ATTACHMENT 1

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TECHNICAL EVALUATION REPORT
PUMP AND VALVE INSERVICE TESTING PROGRAM
WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

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ABSTRACT

This EG&G Idaho, Inc., report presents the results of our evaluation of the Wolf Creek Generating Station Inservice Testing Program for safety-related pumps and valves.

FOREWORD

This report is supplied as part of the "Review of Pump and Valve Inservice Testing Programs for Operating Reactors" being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Mechanical Engineering Branch by EG&G Idaho, Inc., Mechanical Systems Evaluations.

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1. INTRODUCTION

Contained herein is a technical evaluation of the pump and valve inservice testing (IST) program submitted by Wolf Creek Nuclear Operating Corporation for its Wolf Creek Generating Station.

The working session with Wolf Creek Nuclear Operating Corporation representatives was conducted on September 8 and 9, 1986. The licensee's IST program, Revision 6 dated March 2, 1987, was reviewed to verify compliance of proposed tests of pumps and valves whose function is safety related with the requirements of the ASME Boiler and Pressure Vessel Code (the Code), Section XI, 1980 Edition through Winter 1981 Addenda. Any IST program revisions subsequent to those noted above are not addressed in this technical evaluation report (TER). Required program changes, such as revised or additional relief requests or the deletion of any components from the IST program, should be submitted to the NRC under separate cover in order to receive prompt attention, but should not be implemented prior to review and approval by the NRC.

In their IST program, Wolf Creek Nuclear Operating Corporation has requested relief from the ASME Code testing requirements for specific pumps and valves and these requests have been evaluated individually to determine if the required testing is indeed impractical for the specified pumps or valves. This review was performed utilizing the acceptance criteria of the Standard Review Plan, NUREG-0800, Section 3.9.6, and the Draft Regulatory Guide and Value/Impact Statement titled "Identification of Valves for Inclusion in Inservice Testing Programs". 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 scope of this review.

Section 3 of this report presents the Wolf Creek Nuclear Operating Corporation relief requests and EG&G's evaluations and conclusions regarding these requests for the pump testing program. Similar information is presented in Section 4 for the valve testing program.

Category A, B, C, and A/C valves which are exercised during cold shutdowns and refueling outages and meet the requirements of the ASME Code, Section XI are discussed in Appendix A.

A listing of P&IDs used for this review is contained in Appendix B.

Inconsistencies and omissions in the licensee's IST program noted during the course of this review are listed in Appendix C. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

2. SCOPE

The EG&G Idaho review of the Wolf Creek Generating Station inservice testing program for pumps and valves was begun in November of 1984. The program initially examined was dated July 31, 1984, which identified the licensee's proposed testing of safety related pumps and valves in the plant systems listed in Appendix B.

To review the licensee's proposed testing of certain pumps and valves in these systems, they were first located and highlighted on the appropriate system P&IDs. After identifying the components and determining their function in the system, the proposed testing was evaluated to determine if it was in compliance with the ASME Code requirements, based on the component type and function. For pumps, it was verified that each of the seven inservice test quantities of Table IWP-3100-1 is measured or observed as appropriate. For those test quantities that are not being measured or observed quarterly in accordance with the Code, it was verified that a request for relief from the Code requirements had been submitted. If the testing is not being performed in accordance with the Code and a relief request had not been submitted, additional information was requested from the licensee to explain the inconsistency. This request for supplemental information formed the basis for the Request for Additional Information (RAI) document that also served as the agenda for the working meeting between the licensee, the NRC, and the EG&G reviewers which took place following the IST program review.

The relief requests were individually evaluated to determine if the licensee clearly demonstrated that compliance with the Code required testing is impractical for the identified system components, and to determine if their proposed alternate testing provides a reasonable indication of component condition and degradation. Where the licensee's technical basis or alternate testing was insufficient or unclear, the licensee was requested to supplement or clarify the relief request. The system P&ID was also examined to determine whether the instrumentation necessary to make the identified measurements is available. If, based on the unavailability of adequate instrumentation or the reviewers experience and system knowledge, it was determined that it may not be possible or practical to make the measurements as described by the licensee in his IST program, a question or comment was generated requesting the licensee to clarify his position.

The review of the proposed testing of valves verified that all appropriate ASME Code testing for each individual valve is performed as required. The proposed testing was evaluated to determine if all valves that were judged to be active category A, B, and/or C, (other than safety and relief valves) are exercised quarterly in accordance with IWV-3410 or 3520, as appropriate. If any active safety related valve is not full-stroke exercised quarterly as required, then the licensee's justification for the deviation, either in the form of a cold shutdown justification or a relief request, was examined to determine its accuracy and adequacy. The proposed alternate testing was also evaluated to determine if all testing is being performed that can reasonably be performed on each particular valve to bring its testing as close to compliance with the Code requirement as practical.

For valves having remote position indication, the reviewer confirmed that the valve remote position indication is verified in accordance with IWV-3300. The reviewer verified that the licensee had assigned limiting values of full-stroke times for all power operated valves in the IST program as required by IWV-3413. The assigned limits were examined to determine if they are reasonable for the size and type of valve and the type of valve operator. It was also verified that the valve full-stroke times are being measured every time that the valves are full-stroke exercised for the IST program. For valves having a fail-safe actuator, the reviewer confirmed that the valve's fail-safe actuator is tested in accordance with IWV-3415.

It was confirmed that all category A and A/C valves are leak rate tested to either the 10 CFR 50, Appendix J, and Section XI, IWV-3426 and 3427 requirements, for those valves that perform a containment isolation function, or to the Section XI, IWV-3421 through 3427 requirements for those valves that perform a pressure boundary isolation function. It was also verified that valves that perform both a containment isolation and a pressure isolation function are leak rate tested to both the Appendix J and the Section XI requirements. Furthermore, if any valve appeared to perform a containment isolation and/or a pressure isolation function but was not categorized A or A/C and being leak rate tested, the licensee was asked to verify that those valves had not been categorized improperly in the IST program.

Each check valve was evaluated to determine if the licensee's proposed testing does verify the valve's ability to perform its safety related function(s). Extensive system knowledge and experience with other similar facilities were used to determine whether the proposed tests will full-stroke the check valve disks open or verify their reverse flow closure capability. If there was any doubt about the adequacy of the identified testing, questions were included in the RAI which required the licensee to address these concerns.

A further evaluation was performed on all valves in the program to determine that the identified testing could practically and safely be conducted as described. If the ability to perform the testing was in doubt, a question was formulated to alert the licensee to the suspected problem.

Safety related safety valves and relief valves, excluding those that perform only a thermal relief function, were confirmed to be included in the IST program and are tested in accordance with IWV-3510.

After all of the valves in the licensee's IST program had been identified on the P&IDs and evaluated as described above, the P&IDs were examined closely by at least two trained and experienced reviewers to determine if any pumps or valves that may perform a safety related function were not included in the licensee's program. The licensee was asked to reconcile any valves that were identified by this process and had been omitted from the IST program. Also, the list of systems included in the licensee's program was compared to a system list in the Draft Regulatory Guide and Value/Impact Statement titled, "Identification of Valves for Inclusion in Inservice Testing Programs". Systems that appear in the Draft Regulatory Guide list but not in the licensee's program were evaluated and, if appropriate, questions were added to the RAI concerning safety related pumps and valves in those systems.

Additionally, if the reviewers suspected a specific or a general aspect of the licensee's IST program based on their past experiences, questions were written for inclusion in the RAI to clarify those areas of doubt. Some questions were included for the purpose of allowing the reviewers to make conclusive statements in this report.

At the completion of the review, the questions and comments generated during the review were transmitted to the licensee. These questions were later used as the agenda for the working meeting with the licensee on September 8 and 9, 1986. At the meeting each question and comment was discussed in detail and resolved as follows:

a. The licensee agreed to make the necessary IST program corrections or changes that satisfied the concerns of the NRC and their reviewers.

b. The licensee provided additional information or clarification about their IST program that satisfied the concerns of the NRC and their reviewers, and no program change was required.

c. The item remained open for the licensee to further investigate and propose a solution to the NRC.

d. The item remained open for further investigation by the NRC.

e. The item remained open for further investigation and discussion by both the NRC and the licensee.

A revised IST program dated March 2, 1987 was received and was compared to the previous submittal to identify any changes. The changes were evaluated to determine whether they were acceptable and if not, they were added to the items that remained open from the meeting. Several conference calls were held between the licensee, the NRC, and the reviewers to clarify the NRC positions on the open items and discuss the licensee's proposed resolutions.

This TER is based on information contained in the submittals and on information obtained in the meetings and conference calls which took place during the review process.

3. PUMP TESTING PROGRAM

The Wolf Creek Generating Station IST program submitted by Wolf Creek Nuclear Operating Corporation was examined to verify that all pumps that are included in the program are subjected to the periodic tests required by the ASME Code, Section XI, except for those pumps identified below for which specific relief from testing has been requested and as summarized in Appendix C. Each Wolf Creek Nuclear Operating Corporation basis for requesting relief from the pump testing requirements and the EG&G reviewer's evaluation of that request is summarized below.

3.1 All Pumps in the IST Program

3.1.1 Relief Request. The licensee has requested relief from the bearing temperature measurement requirements of Section XI, Paragraph IWP-3100, for the auxiliary feedwater pumps PAL01A, PAL01B, and PAL02, boric acid transfer pumps PBG02A and PBG02B, centrifugal charging pumps PBG05A and PBG05B, fuel pool cooling pumps PEC01A and PEC01B, essential service water pumps PEF01A and PEF01B, component cooling water pumps PEG01A, PEG01B, PEG01C, and PEG01D, residual heat removal pumps PEJ01A and PEJ01B, safety injection pumps PEM01A and PEM01B, containment spray pumps PEN01A and PEN01B, and emergency fuel oil transfer pumps PJE01A and PJE01B.

3.1.1.1 Licensee's Basis for Requesting Relief. Bearings of certain pumps addressed in this relief request are cooled by their respective process fluid. Thus, bearing temperature measurements would be highly dependent on the temperature of the cooling medium. Bearing temperature taken at one year intervals provides little data toward determining the incremental degradation of a bearing or providing any meaningful trend information. All pumps addressed by this relief request, except for the emergency fuel oil transfer pumps, are subjected to vibration measurements on a quarterly basis in accordance with IWP-4500. Vibration measurements are a significantly more reliable indication of pump bearing degradation than are temperature measurements.

3.1.1.2 Evaluation. Measuring pump vibration quarterly gives a more accurate indication of pump bearing condition than the temperature measurement and the vibration measurement is not substantially affected by any system parameter or other factor that could mask problems or result in erroneous indications of bearing degradation. However, the annual Code required bearing temperature measurement is not impractical and the deletion of this measurement without any alternative measurement is not acceptable. Based on the determination that the Code requirements are not impractical, relief may be granted as requested only for those pumps whose bearings do not have permanently installed temperature monitoring devices and/or are not accessible for measurement with a portable temperature measuring device.

3.2 Pump Instrumentation

3.2.1 Relief Request. The licensee has requested relief from the pump instrumentation full-scale range requirements of Section XI, Paragraph IWP-4120, for all pumps in the IST program for vibration measurement and has proposed to utilize a vibration detector with multiple over-lapping scales.

3.2.1.1 Licensee's Basis for Requesting Relief. Vibration detectors usually have multiple over-lapping scales rather than a single full scale range. It is not practical to apply the requirement of three times the reference value or less. When the reference value falls under 0.5 mils a detector with the three-times-or-less scale would not allow a measurement in the Required Action Range of greater than 1.5 mils. For example, with a reference value of 0.3 mils and using a detector with a range of 0-0.9 mils, the determination of being in the Alert Range (1.0-1.5 mils) or the Required Action Range (greater than 1.5 mils) could not be accomplished.

3.2.1.2 Evaluation. The licensee has demonstrated that a vibration detector with multiple over-lapping scales should be sufficient to measure pump vibration and that over-lapping scales will allow the licensee to detect vibration in the Alert and Required Action ranges. Based on the determination that the Code requirements are impractical and the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

3.2.2 Relief Request. The licensee has requested relief from the pressure instrument accuracy requirement for the measurement of inlet pressure for the emergency fuel oil transfer pumps PJE01A and PJE01B in accordance with the requirement of Section XI, Paragraph IWP-4110 and has proposed to utilize a level indicator with an accuracy of plus or minus 2.5 %.

3.2.2.1 Licensee's Basis for Requesting Relief. Inlet pressure and differential pressure of the emergency fuel oil transfer pumps are calculated utilizing a level measurement (see 3.3.1 pump relief request). The only practical means available for level measurement is with permanent plant instrumentation. Level is measured with a level indicator that has a maximum allowable accuracy of plus or minus 2.5%.

3.2.2.2 Evaluation. Because of the design of this system, compliance with the Code requirements is impractical. Utilizing a level indicator with an accuracy of plus or minus 2.5% to calculate pump inlet pressure provides a reasonable alternative to the Code requirements as conformance with the Code would only be possible if the emergency fuel oil transfer pump system were substantially redesigned. Based on the determination that the Code requirements are impractical, and considering the licensee's proposed alternative calculation utilizing tank level indication, and the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

3.3 Pump Pressure and Flow Measurements

3.3.1 Relief Request. The licensee has requested relief from the Section XI, Table IWP-3100-1 requirement of measuring pump inlet pressure for the essential service water pumps PEF01A and PEF01B and the emergency fuel oil transfer pumps PJE01A and PJE01B and has proposed to calculate a single inlet pressure for these pumps based on the submergence depth of the pumps.

3.3.1.1 Licensee's Basis for Requesting Relief. The essential service water and emergency fuel oil transfer pumps are submerged and the pump inlet pressure are assumed to correspond to that of the static head of the medium in which the pumps reside. Since these levels remain essentially constant through the duration of the tests, only one measurement is required.

3.3.1.2 Evaluation. Because of the design of these systems, compliance with the Code requirements is impractical. Calculation of the inlet pressure for the essential service water and emergency fuel oil transfer pumps from the static head of the medium in which the pumps reside provides a reasonable alternative for measuring pump inlet pressure, as conformance with the Code would only be possible if the emergency fuel oil transfer and essential service water systems were substantially redesigned. Since these head levels remain essentially constant during the tests, one measurement of the head level should be sufficient for calculation of inlet pressure. Based on the determination that the Code requirements are impractical, and considering the licensee's proposed alternative calculation utilizing suction head level, and the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

3.3.2 Relief Request. The licensee has requested relief from the Section XI, Paragraph IWP-4600 requirement that flow rate shall be measured using a rate or quantity meter installed in the pump test circuit for the boric acid transfer pumps PBG02A and PBG02B and the emergency fuel oil transfer pumps PJE01A and PJE01B.

3.3.2.1 Licensee's Basis for Requesting Relief. There is no flow instrumentation installed in the test flow path for these pumps. All of the pump tests will be performed with the system lined up in a recirculation flow path or fixed resistance flow path. Therefore, system flow characteristics will be the same for each test. In a fixed resistance system (pump running in a recirculation test flow path) pump differential pressure is indicative of pump performance. For the reasons stated above flow rates will not be measured.

3.3.2.2 Evaluation. Not having permanent flow rate measurement instruments does not negate the requirement to measure pump flow rate. Lack of instrumentation is not sufficient justification to not measure Code required parameters. Based on the determination that the Code requirements are not impractical, relief should not be granted as requested.

3.4 Pump Vibration Measurements

3.4.1 Relief Request. The licensee has requested relief from the Section XI, Paragraph IWP-3100 requirement that pump vibration shall be measured during each pump test for the emergency fuel oil transfer pumps PJE01A and PJE01B.

3.4.1.1 Licensee's Basis for Requesting Relief. The emergency fuel oil transfer pumps are submerged within the diesel fuel oil tanks, thus inaccessible. Therefore, a vibration measurement is impractical.

3.4.1.2 Evaluation. As the emergency fuel oil transfer pumps are submerged within the diesel fuel oil tanks, a vibration measurement for these pumps is impractical. Because of the design of this system, compliance with the Code requirements is impractical and conformance with the Code would only be possible if the fuel oil transfer system were substantially redesigned. Based on the determination that the Code requirements are impractical, and considering the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

3.4.2 Relief Request. The licensee has requested relief from the Section XI, Paragraph IWP-4510 requirement for the essential service water pumps PEF01A and PEF01B that vibration measurements shall be taken on the bearing housing near the pump coupling and has proposed that this measurement be taken on the pumps' associated motor bearing housing.

3.4.2.1 Licensee's Basis for Requesting Relief. The essential service water pumps are vertical, multistage pumps submerged in their process fluid and thus are inaccessible. As an alternative vibration measurements will be taken on the pumps' associated motor bearings housing.

3.4.2.2 Evaluation. It is impractical to measure the essential service water pumps vibration on the bearing housing near the pump coupling as these pumps operate in a submerged environment. However, to obtain a measurement of pump bearing degradation, the licensee should measure vibration for these pumps on the motor bearing housing that contains the thrust bearings. Because of the design of this system, compliance with the Code requirements is impractical and conformance with the Code would only be possible if the essential service water system were substantially redesigned. Based on the determination that the Code requirements are impractical, and considering the licensee's proposed alternative measurements of pump vibration taken on the pumps' associated motor bearing housing and the burden on the licensee if the Code requirements were imposed, relief may be granted as requested. This relief is granted on the condition that the licensee measure vibration on the pumps' associated motor bearing housing that contains the motor thrust bearing.

3.5 Pump Miscellaneous Requirements

3.5.1 Relief Request. The licensee has requested relief from the Section XI, Paragraph IWP-3500(a) requirement that the emergency fuel oil transfer pumps PJE01A and PJE01B be operated at least 5 minutes prior to test data measurement and as an alternative has proposed that these pumps be operated for one minute prior to taking data, after pump discharge pressure has stabilized.

3.5.1.1 Licensee's Basis for Requesting Relief. The emergency fuel oil day tanks have an automatic pump shutoff corresponding to a certain level of oil. The pumps would have reached the level of automatic pump shutoff before the 5 minutes had elapsed. Therefore a 5 minute pump run time is impractical. Furthermore, pump discharge pressure has been observed to stabilize in less than 5 minutes.

3.5.1.2 Evaluation. A 5 minute pump run prior to obtaining Code required data for the emergency fuel oil transfer pumps is not feasible due to the pumps' automatic day tank level shutoff. If the automatic day tank level shutoff were defeated and the pump allowed to operate for 5 minutes, a diesel fuel oil spill could result. As pump discharge pressure has been observed to stabilize in less than 5 minutes, operating the pump for one minute after pump discharge pressure has stabilized and then recording data is a reasonable alternative to the Code requirement of a 5 minute pump run. Because of the design of this system, compliance with the Code requirements is impractical and conformance with the Code would only be possible if the fuel oil transfer system were substantially redesigned. Based on the determination that the Code requirements are impractical, and considering the licensee's proposed alternative diesel fuel oil transfer pump run and the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

3.5.2 Relief Request. The licensee has requested relief from the Section XI, Table IWP-3100-2 limit for the Alert-range (high) value and for the Required-action range (high) value; and corrective action requirements of Paragraph IWP-3230(b) for differential pressure and flowrate measurements for auxiliary feedwater pumps PAL01A, PAL01B, and PAL02, centrifugal charging pumps PGB05A and PGB05B, essential service water pump PEF01B, component cooling water pumps PEG01A, PEG01B, and PEG01C, residual heat removal pumps PEJ01A and PEJ01B, safety injection pump PEM01A, emergency fuel oil transfer pumps PJE01A and PJE01B, and fuel pool coolant pumps PEC01A and PEC01B. As an alternative, the licensee has proposed that the Required-action range (high) limit and corrective action requirements of IWV-3230(b) be eliminated and the Alert-range (high) limit be raised to 105% of reference value for flowrate and differential pressure measurements for the above pumps.

3.5.2.1 Licensee's Basis for Requesting Relief. The requirement to declare a pump inoperative when a test parameter exceeds the reference value by 3% is not technically justified, sound engineering judgement, nor acceptable plant operating practice for the following reasons:

Indiscriminately declaring safety system pumps inoperative results in excessive and unneeded testing of other plant safeguard systems and components. Such testing could ultimately detract from the overall reliability of the plant safety systems. In addition, unwarranted testing unnecessarily adds to the burden of the operations force and dilutes efforts focused on the performance of their primary duties. Also, operators are subjected to additional, and unnecessary radiation exposure.

The case where a test parameter exceeds the reference value is not necessarily indicative of pump degradation. It may merely signify that the reference value is probably at the lower side of the statistical scatter of the test data and the specific test in question is on the upper side. Note that tne reference values are subject to the same elements of statistical error associated with any other individual test.

The 3% limitation is overly restrictive when compared to the accuracy of the instrumentation used to gather the test data. Analysis has shown that, in order to consistently remain below the 3% limit, instrument loop accuracies in the range 0.5 to 0.75% would be required. This presents a significantly more restrictive requirement than that established by paragraph IWP-4110 (plus or minus 2%).

Power plant operating systems are not configured in a manner that provides the laboratory type conditions demanded to meet the repeatability implied by the 3% restriction. Several of the tests require throttling with large gate or butterfly valves using remote manual control. Thus, nonquantifiable system flow conditions are created that are certain to affect measured test quantities.

To ensure the reference values do not reflect operations at the lower end of the performance spectrum and, thus, ultimately be reflected in frequently exceeding the upper performance limits as a result of instrument drift, all related instrumentation is calibrated on a frequent basis.

This requirement provides no additional measure of reliability to the equipment.

When the upper limits are exceeded, the only reasonable way of correcting the inoperative condition is to conduct an analysis to ensure that the pump is indeed operable and capable of meeting its intended function. When this is done, in accordance with subarticle IWP-3220 (c), a new reference value must be established. Due to the test conditions and methods of testing at WCGS, any change in the reference point eliminates the correlation of future test results with past pump performance. Because, the usefulness of any past data in determining a trend for pump performance is essentially eliminated a primary goal and basis for the inservice testing program could be jeopardized.

3.5.2.2 Evaluation. The licensee has not clearly demonstrated that deleting of the Required-action range (high) limit and corrective action requirements of IWV-3230(b) and the raising of the Alert-range (high) limit to 105% of reference value for flowrate and differential pressure measurements for auxiliary feedwater pumps PAL01A, PAL01B, and PAL02, centrifugal charging pumps PGB05A and PGB05B, essential service water pump PEF01B, component cooling water pumps PEG01A, PEG01B, and PEG01C, residual heat removal pumps PEJ01A and PEJ01B, safety injection pump PEM01A, emergency fuel oil transfer pumps PJE01A and PJE01B, and fuel pool coolant pumps PEC01A and PEC01B is a reasonable alternative to the Code required testing. Based on the determination that the Code requirements are not impractical, relief may not be granted as requested,

4. VALVE TESTING PROGRAM

The Wolf Creek Generating Station IST Program submitted by Wolf Creek Nuclear Operating Corporation was examined to verify that all valves included in the program are subjected to the periodic tests required by the ASME Code, Section XI, 1980 Edition through Winter 1981 Addenda, and the NRC positions and guidelines. The reviewer found that, except as noted in Appendix C or where specific relief from testing has been requested, these valves are tested to the Code requirements. Each Wolf Creek Nuclear Operating Corporation basis for requesting relief from the valve testing requirements and the reviewer's evaluation of that request is summarized below and grouped according to system and valve category.

4.1 All Systems

4.1.1 Valves Tested During Cold Shutdown

4.1.1.1 Relief Request. The licensee has requested relief from the corrective action requirement of Section XI, Paragraph IWV-3417(a) for category A and category B valves identified as being tested on a cold shutdown frequency (see Appendix B of this report) and has proposed to modify the required monthly testing frequency for degraded valves to a cold shutdown frequency.

4.1.1.1.1 Licensee's Basis for Requesting Relief. It is impractical to increase test frequency to once each month when measured stroke time is greater than the code trending limits specified in IWV-3417(a). Cold shutdown and refueling outage time is usually kept to a minimum, sometimes under one month. Reasons given in notes and relief requests for not stroke timing valves during power operations are the same reasons the test frequency cannot be increased. Furthermore, strict adherence to IWV-3417(a) would force plant shutdown to facilitate stroke time testing. As an alternative, the test frequency shall be increased to once each cold shutdown, not to exceed once each month.

4.1.1.1.2 Evaluation. The licensee's basis for requesting relief from the increased test frequency requirements of Section XI for those valves that are specifically identified for testing only during cold shutdowns is not adequate. The Code requires an increased frequency of tests to assure continued operability of the degraded valves. Valves that are specifically identified for testing only during cold shutdowns and refueling outages that are found to have exceeded the allowable change in stroke time and cannot be tested at the increased frequency should be repaired and demonstrated operable prior to being required for plant operation by the plant Technical Specifications. Since the licensee has not demonstrated that the Code requirements are impractical, relief should not be granted as requested.

4.1.2 Containment Isolation Valves

4.1.2.1 Relief Request. The licensee has requested relief from valve leak rate testing for containment isolation category A and A/C valves in accordance with the requirements of Section XI, Paragraphs IWV-3421 through -3425 and has proposed to leak rate test these valves in accordance with the requirements of 10 CFR 50, Appendix J.

4.1.2.1.1 Licensee's Basis for Requesting Relief. Leakage testing requirements for containment isolation valves are determined by 10 CFR 50, Appendix J. These testing requirements meet the intent of IWV-3421 through IWV-3425, and therefore it is impractical to perform separate leak rate tests. As an alternative, these valves will be leak rate tested in accordance with the requirements of 10 CFR 50, Appendix J.

4.1.2.1.2 Evaluation. Leak rate testing these containment isolation valves in accordance with 10 CFR 50, Appendix J requirements will assure valve leak tight integrity as required by the Code, however, the licensee must also comply with the requirements of Section XI, Paragraphs IWV-3426 and 3427 in order to be granted this relief. Based on the licensee's proposed alternative testing, relief from the Code requirements may be granted, provided the licensee complies with Section XI, Paragraphs IWV-3426 and 3427 requirements.

4.1.3 Pressure Boundary Isolation Valves

4.1.3.1 Relief Request. The licensee has requested relief from valve leak rate testing for reactor coolant system (RCS) pressure boundary isolation category A and A/C valves in accordance with the requirements of Section XI, Paragraphs IWV-3421 through -3427 and has proposed to leak rate test these valves in accordance with the plant Technical Specifications requirements.

4.1.3.1.1 Licensee's Basis for Requesting Relief. Leakage testing, including testing requirements are governed by plant Technical Specifications. These valves are adequately tested per Technical Specifications. The testing requirements utilized meet the intent of ASME Section XI leak rate testing and it is therefore impractical to perform separate leak rate tests. As an alternative, these valves will be leak rate tested in accordance with RCS Pressure Isolation Valve leak rate testing per Technical Specifications 3.4.6.2.f and 4.4.6.2.2.

4.1.3.1.2 Evaluation. The Wolf Creek Technical Specifications identify in Table 3.4-1 valves that are leak rate tested as pressure isolation valves and establishes the maximum permissible leakage rate of 1 gpm (3.4.5.2.f), the test pressure requirements, the test frequency requirements (4.4.6.2.2), and the required action if the leak rate limit is exceeded. The Technical Specification testing of the reactor coolant system pressure isolation valves essentially meets the Section XI Code requirements since it incorporates all of the major elements of Paragraphs IWV-3421 through 3427. The Technical Specification leak rate testing adequately and reasonably determines the leak tight integrity of these valves. Based on the licensee's proposed alternative testing, relief from the Code requirements may be granted as requested.

4.1.3.2 Relief Request. The licensee has requested relief from exercising the following RCS pressure boundary isolation check valves in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve closure capability during RCS pressure isolation valve leak rate testing which is performed at least once per 18 months.

BB-8948A	BB-8948B	BB-8948C	BB-8948D
BB-8949A	BB-8949B	BB-8949C	BB-8949D
BB-V001	BB-V022	BB-V040	BB-V059
EJ-8841A	EJ-8841B	EM-8815	EM-V001
EM-V002	EM-V003	EM-V004	EP-8818A
EP-8818B	EP-8818C	EP-8818D	EP-8956A
EP-8956B	EP-8956C	EP-8956D	EP-V010
EP-V020	EP-V030	EP-V040	

4.1.3.2.1 Licensee's Basis for Requesting Relief. There is no practical method of verifying valve closure. System design provides no indication for verifying valve closure. Quarterly exercising of valves BB-V001, V022, V040, V059 and EM-8815 would result in thermal shock to RCS piping. The remaining valves cannot be exercised due to system pressure not being able to overcome RCS pressure. To perform a closure verification constitutes a leak test, which presents a significant hardship during cold shutdowns. Containment entry is required to perform a leak test which is highly undesirable during cold shutdowns. Leak testing also causes extended cold shutdowns due to the time it takes for performance. As an alternative, verification of valve closure for RCS pressure boundary isolation check valves will be done in conjunction with RCS pressure isolation valve leak rate testing which will be performed at least once per 18 months.

4.1.3.2.2 Evaluation. Verifying reactor coolant system (RCS) pressure boundary isolation check valves closure during RCS pressure isolation valve leak rate testing at least once per 18 months should be sufficient to determine proper valve closure capability and leak tight integrity as required by the Code (These valves have their forward flow operability tested on either a cold shutdown or relief requested refueling

outage frequency). Conformance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown and valve leak testing. Testing during cold shutdown could delay plant startup. Based on the impracticality of complying with the Code required test method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing, relief from the Code requirement may be granted as requested.

4.2 Reactor Coolant System

4.2.1 Category C Valves

4.2.1.1 Relief Request. The licensee has requested relief from exercising valves 8010A, 8010B, and 8010C, pressurizer safety relief valves in order to determine proper remote position indication, in accordance with the requirement of Section XI, Paragraph IWV-3300 and has proposed to verify remote position indication by detaching the indicators from the valves and simulating valve movement on the indicators to energize the remote valve position indicators.

4.2.1.1.1 Licensee's Basis for Requesting Relief. If these valves are actuated for the position indication test they need to be retested to ensure the set relief pressure is correct. This involves increased testing and unnecessary radiation exposure to test personnel. As an alternative, the valve's lift indicating switch assembly will be detached from the valve spindle and a magnet and a lift indicating switch setting tool will be used to simulate valve opening and valve closing position which verifies lift indicating switch assembly position with remote position indication.

4.2.1.1.2 Evaluation. Detaching the indicators from the pressurizer safety relief valves and simulating valve movement on the indicators to energize the remote valve position indicators is an acceptable alternative to verify these valves' remote position indication. Causing the safety valves to lift with pressure to verify remote position indication is

not a reasonable test method as it would require removal and replacement of the safety valves in order to reverify their lift pressure setpoint. Conformance with the Code required testing method is impractical due to system design. Based on the impracticality of complying with the Code required test method, the burden to the licensee of complying with the Code required testing, and the licensee's proposed alternative testing, relief from the Code requirement may be granted as requested.

4.2.2 Category A/C Valves

4.2.2.1 Relief Request. The licensee has requested relief from exercising reactor coolant pump (RCP) seal water supply check valves V118, V148, V178, and V208 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve closure capability during 10 CFR 50, Appendix J, Type C valve leak rate testing which is performed at least once per 2 years.

4.2.2.1.1 Licensee's Basis for Requesting Relief. When these valves are in operation there is no practical means to test valve closure. Valve closure cannot be verified due to system design. To perform a closure verification constitutes a leak test which presents a significant hardship during cold shutdown. Leak testing requires an extended period of time which causes extended outages of securing seal water injection to RCP seals, securing normal charging, securing component cooling water and securing instrument air. As an alternative, verification of valve closure will be done in conjunction with the 10 CFR 50, Appendix J, Type C leak tests conducted at least once per 2 years.

4.2.2.1.2 Evaluation. Valves V118, V148, V178, and V208 cannot be closure verified during power operation or cold shutdown as the only method available to verify valve closure is valve leak testing. These valves are not equipped with valve position indication and some of the required test connections are located inside containment. Conformance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and containment

entry. Testing during cold shutdown could delay plant startup. Based on the impracticality of complying with the Code required testing method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing, relief from the Code requirements may be granted as requested.

4.2.2.2 Relief Request. The licensee has requested relief from exercising safety injection system (SIS) boron injection tank to RCS check valves V001, V022, V040, and V059 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.2.2.2.1 Licensee's Basis for Requesting Relief. Exercising these valves during normal operations would result in thermal shock of the RCS piping and a power decrease due to injection of boric acid into the RCS. Exercising at cold shutdowns could result in cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.2.2.2.2 Evaluation. Valves V001, V022, V040, and V059 cannot be full-stroke exercised during power operation due to RCS thermal shock considerations and RCS boron concentration changes which could result in plant shutdown. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.2.2.3 Relief Request. The licensee has requested relief from exercising RCS hot leg injection check valves 8949A, 8949B, 8949C, and 8949D in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.2.2.3.1 Licensee's Basis for Requesting Relief. Full-stroke or partial-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. Full-stroke exercising during cold shutdowns cannot be accomplished since the flow rate required to full-stroke the valves would require injection into the RCS, which could cause cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.2.2.3.2 Evaluation. Valves 8949A, 8949B, 8949C, and 8949D cannot be full-stroke exercised during power operation due to residual heat removal (RHR) and SIS pumps not being able to overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown with the SIS pumps since this could result in low temperature overpressurization of the RCS. Valves 8949B and 8949C cannot be full-stroke exercised during cold shutdown with the RHR pumps as this would divert cooling water from the reactor core. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.2.2.4 Relief Request. The licensee has requested relief from exercising accumulator, SIS, and RHR to RCS cold leg injection check valves 8948A, 8948B, 8948C, and 8948D in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves on a refueling outage frequency.

4.2.2.4.1 Licensee's Basis for Requesting Relief. Full-stroke or partial-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. Full-stroke exercising during cold shutdowns cannot be accomplished since the flow rate required to full-stroke the valves would require injection into the RCS, which could cause cold overpressurization of the RCS. These valves cannot be full-stroke exercised during refueling due

to accident conditions not existing and not being able to simulate those conditions. The valves are tested with as much flow through them as possible. As an alternative, these valves will be partial-stroke exercised during refueling outages.

4.2.2.4.2 Evaluation. Valves 8948A, 8948B, 8948C, and 8948D cannot be exercised during power operation since accumulator pressure cannot overcome RCS pressure. These valves cannot be exercised during cold shutdown since this could result in low temperature overpressurization of the RCS.

These valves can be partial-stroke exercised on a refueling outage frequency, however, this does not demonstrate the ability of these valves to full-stroke when required to perform their safety function. Valve disassembly/inspection using a manual full-stroke of the disk is an acceptable alternative method to verify the full-stroke capability of check valves. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number and materials of construction) and must have the same service conditions. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

A different valve of each group is re ired to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

Based on the determination that the Code requirements are not impractical and that a suitable method is available to full-stroke exercise these valves, relief should not be granted as requested.

4.3 Chemical and Volume Control System

4.3.1 Category C Valves

4.3.1.1 Relief Request. The licensee has requested relief from exercising centrifugal charging pump discharge check valves 8481A and 8481B in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves quarterly and by full-stroke exercising these valves on a refueling outage frequency.

4.3.1.1.1 Licensee's Basis for Requesting Relief. Full-stroke exercising during normal operation would require injecting borated water into the RCS which could cause a power decrease. Furthermore, full-flow exercising of these valves cannot be performed during power operations or cold shutdowns due to the existence of insufficient volume expansion to accommodate the flow required for testing. Full-stroke exercising during cold shutdown could also cause cold overpressurization of the RCS. As an alternative, these valves will be partial-stroke exercised every 3 months and full-stroke exercised during refuelings.

4.3.1.1.2 Evaluation. Valves 8481A and 8481B cannot be full-stroke exercised during power operation due to insufficient RCS expansion volume to accommodate the required flow. These valves cannot be full-stroke exercised during cold shutdown since this could result in low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.3.1.2 Relief Request. The licensee has requested relief from exercising centrifugal charging pumps suctions from the refueling water storage tank (RWST) check valves 8546A and 8546B in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.3.1.2.1 Licensee's Basis for Requesting Relief. Full- or partial-stroke exercising these valves during normal operations would increase boron inventory in the RCS and cause a power decrease, which could result in plant shutdown. Furthermore, full-flow exercising during power operations or cold shutdowns is impossible due to the fact that there is insufficient volume expansion to accommodate the flow required for testing. Also, full-stroke exercising during cold shutdowns could cause cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.3.1.2.2 Evaluation. Valves 8546A and 8546B cannot be full-stroke exercised during power operation due to insufficient RCS expansion volume to accommodate the required flow. These valves cannot be full-stroke exercised during cold shutdown since this could result in low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.3.2 Category A/C Valves

4.3.2.1 Relief Request. The licensee has requested relief from exercising regenerative heat exchanger charging inlet check valve V8381 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve closure capability during 10 CFR 50, Appendix J, Type C, valve leak rate testing which is performed at least once per 2 years.

4.3.2.1.1 Licensee's Basis for Requesting Relief. When this valve is in operation there is no practical means to test valve closure. Valve closure cannot be verified due to system design. To perform a closure verification constitutes a leak test which presents a significant hardship during cold shutdown. Leak testing requires an extended period of time which causes extended outages of securing seal water injection to RCP seals, securing normal charging, securing component cooling water and securing instrument air. As an alternative, verification of valve closure will be done in conjunction with the 10 CFR 50, Appendix J, Type C, leak tests conducted at least once per 2 years.

4.3.2.1.2 Evaluation. Valve V8381 cannot be verified to close during power operation or cold shutdown as the only method available to verify valve closure is valve leak testing. This valve is not equipped with valve position indication and some of the required test connections are located inside containment. Conformance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown and containment entry. Testing during cold shutdown could delay plant startup. Based on the impracticality of complying with the Code required testing method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing, relief from the Code requirements may be granted as requested.

4.4 Component Cooling Water System

4.4.1 Category A/C Valves

4.4.1.1 Relief Request. The licensee has requested relief from exercising containment component cooling water supply check valve V204 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve closure capability during 10 CFR 50, Appendix J, Type C, valve leak rate testing which is performed at least once per 2 years.

4.4.1.1.1 Licensee's Basis for Requesting Relief. When this valve is in operation there is no practical means to test valve closure. Valve closure cannot be verified due to system design. To perform a closure verification constitutes a leak test which presents a significant hardship during cold shutdown. Leak testing requires an extended period of time which causes extended outages of securing seal water injection to RCP seals, securing normal charging, securing component cooling water and securing instrument air. As an alternative, verification of valve closure will be done in conjunction with the 10 CFR 50, Appendix J, Type C, leak tests conducted at least once per 2 years.

4.4.1.1.2 Evaluation. Valve V204 cannot be verified to close during power operation or cold shutdown as the only method available to verify valve closure is valve leak testing. This valve is not equipped with valve position indication and some of the required test connections are located inside containment. Conformance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown and containment entry. Testing during cold shutdown could delay plant startup. Based on the impracticality of complying with the Code required testing method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing, relief from the Code requirements may be granted as requested.

4.5 Residual Heat Removal System

4.5.1 Category C Valves

4.5.1.1 Relief Request. The licensee has requested relief from exercising RHR pumps suction from the RWST check valves 8958A and 8958B in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves quarterly and by full-stroke exercising these valves on a refueling outage frequency.

4.5.1.1.1 Licensee's Basis for Requesting Relief. The only full-flow flowpath is into the RCS. Full-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdowns or normal operations since insufficient expansion volume exists to accommodate the required flow. As an alternative, these valves will be partial-stroke exercised every 3 months and full-stroke exercised during refueling outages.

4.5.1.1.2 Evaluation. Valves 8958A and 8958B cannot be full-stroke exercised during power operation since RHR pressure cannot overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown since an insufficient expansion volume exists in the RCS to accommodate the required flow. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.5.1.2 Relief Request. The licensee has requested relief from exercising RHR discharge to centrifugal charging pumps check valve 8969A and RHR discharge to SIS pumps check valve 8969B in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.5.1.2.1 Licensee's Basis for Requesting Relief. Full- or partial-stroke exercising of these valves during normal operations would require stroking HV-8804A and HV-8804B. These valves have a control interlock with valve BN-8813 which is required per Technical Specifications to remain open during power operations. Closing BN-8813 would render both emergency core cooling system trains inoperable and would require initiation of shutdown. Full- or partial-stroke exercising of 8969A would require injecting borated water into the RCS which would cause a power decrease.

Full-stroke exercising of 8969B is not possible during normal operations since system pressure required to perform the test is not enough to overcome RCS pressure. Neither valve can be exercised during cold shutdowns since it could result in cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.5.1.2.2 Evaluation. Valve 8969A cannot be full-stroke exercised during power operation as this would inject borated water into the RCS which could cause a power decrease and plant shutdown. Valve 8969B cannot be full-stroke exercised during power operation as SIS pressure cannot overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.6 Safety Injection System

4.6.1 Category C Valves

4.6.1.1 Relief Request. The licensee has requested relief from exercising SIS pumps discharge check valves 8922A and 8922B and SIS pumps suction check valves 8926A and 8926B in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves quarterly and by full-stroke exercising these valves on a refueling outage frequency.

4.6.1.1.1 Licensee's Basis for Requesting Relief. These valves cannot be full-stroke exercised during normal operations. During normal operation these valves will not full-stroke against full RCS pressure. Exercising during cold shutdowns could cause cold overpressurization of the RCS. As an alternative, these valves will be partial-stoke exercised every 3 months and full-stroke exercised during refueling outages.

4.6.1.1.2 Evaluation. Valves 8922A, 8922B, 8926A, and 8926B cannot be full-stroke exercised during power operation as SIS pressure cannot overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.6.2 Category A/C Valves

4.6.2.1 Relief Request. The licensee has requested relief from exercising SIS hot leg injection check valves V001, V002, V003, and V004 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.6.2.1.1 Licensee's Basis for Requesting Relief. Full-stroke or partial-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. Full-stroke exercising cannot be performed during cold shutdowns. The flow rate required to full-stroke the valves would require injection into the RCS which could cause cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.6.2.1.2 Evaluation. Valves V001, V002, V003, and V004 cannot be full-stroke exercised during power operation as SIS pressure cannot overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.6.2.2 Relief Request. The licensee has requested relief from exercising centrifugal charging pump to SIS boron injection tank check valves V240 and V241 and SIS boron injection tank to RCS check valve 8815 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.6.2.2.1 Licensee's Basis for Requesting Relief. Exercising these valves during normal operations would result in thermal shock of the RCS piping and a power decrease due to injection of boric acid into the RCS. Exercising at cold shutdowns could result in cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.6.2.2.2 Evaluation. Valves V240, V241, and 8815 cannot be full-stroke exercised during power operation due to thermal shock to the injection nozzles resulting in premature failure and RCS boron concentration changes that could result in plant shutdown. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.7 Containment Spray System

4.7.1 Category C Valves

4.7.1.1 Relief Request. The licensee has requested relief from exercising containment spray pumps suction from containment sump check valves V002 and V008 and containment spray pumps discharge to spray headers check valves V013 and V017 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by disassembly/inspection of each valve during cold shutdowns.

4.7.1.1.1 Licensee's Basis for Requesting Relief. Testing these valves open per Section XI would involve installing elaborate test equipment and flooding the containment recirculation sump, which is operationally undesirable, and discharging water through the containment spray headers, which is also operationally undesirable. V013 and V017 cannot be tested closed in the manner specified by IWV-3522 due to the check valves being normally closed. Furthermore, any attempt at closure testing during modes 1, 2, 3 or 4 would break containment integrity. As an alternative, these valves will be disassembled and inspected for operability on a cold shutdown testing frequency.

4.7.1.1.2 Evaluation. Valves V002, V008, V013, and V017 cannot be full-stroke exercised during power operation with flow since this would result in spraying containment and could cause electrical equipment damage and wet lagging. Valve disassembly/inspection using a manual full-stroke of the disk is an acceptable alternative method to verify the full-stroke capability of check valves. At each disassembly the applicant must verify that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts). Conformance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdensome since this would require quarterly shutdown, containment entry, and valve disassembly. Based on the impracticality of complying with the Code required testing method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.7.1.2 Relief Request. The licensee has requested relief from exercising containment spray pumps suction from the RWST check valves V003 and V009 and containment spray pumps discharge check valves V004 and V010 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves quarterly.

4.7.1.2.1 Licensee's Basis for Requesting Relief. The flow path that would provide sufficient flow to fully open these valves cannot be utilized since it could result in spraying containment. As an alternative, valves will be partial-stroke exercised open every 3 months.

4.7.1.2.2 Evaluation. Valves V003, V004, V009, and V010 cannot be exercised any time with flow since this would result in spraying containment and could cause electrical equipment damage and wet lagging.

The reviewer agrees with the licensee that these valves can be partial-stroke exercised quarterly, however, this does not demonstrate the ability of these valves to full-stroke when required to perform their safety function. Check valve sample disassembly/inspection using a manual full-stroke of the disk is an acceptable alternative method to verify the full-stroke capability of check valves. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number and materials of construction) and must have the same service conditions. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

A different valve of each group is required to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

Based on the determination that the Code requirements are not impractical and that a suitable method is available to full-stroke exercise these valves, relief should not be granted as requested.

4.8 Accumulator Safety Injection System

4.8.1 Category A/C Valves

4.8.1.1 Relief Request. The licensee has requested relief from exercising accumulator cold leg injection check valves 8956A, 8956B, 8956C, and 8956D in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by partial-stroke exercising these valves on a refueling outage frequency.

4.8.1.1.1 Licensee's Basis for Requesting Relief. Full-stroke or partial-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. Full-stroke exercising during cold shutdowns requires injection into the RCS which could result in cold overpressurization of the RCS. These valves cannot be full-stroke exercised during refueling due to accident conditions not existing and not being able to simulate those conditions. As an alternative, these valves will be partial-stroke exercised during refueling outages.

4.8.1.1.2 Evaluation. Valves 8956A, 8956B, 8956C, and 8956D cannot be exercised during power operation since accumulator pressure cannot overcome RCS pressure. These valves cannot be exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS.

The reviewer agrees with the licensee that these valves can be partial-stroke exercised on a refueling outage frequency, however, this does not demonstrate the ability of these valves to full-stroke when required to perform their safety function. Check valve sample disassembly/inspection using a manual full-stroke of the disk is an acceptable alternative method to verify the full-stroke capability of check valves. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number, and materials of construction) and must have the same service conditions. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

A different valve of each group is required to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

Based on the determination that the Code requirements are not impractical and that a suitable method is available to full-stroke exercise these valves, relief should not be granted as requested.

4.8.1.2 Relief Request. The licensee has requested relief from exercising SIS cold leg injection check valves V010, V020, V030, and V040 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by full-stroke exercising these valves on a refueling outage frequency.

4.8.1.2.1 Licensee's Basis for Requesting Relief. Full-stroke or partial-stroke exercising during normal operations cannot be accomplished since system pressure required to perform the test is not enough to overcome RCS pressure. Full-stroke exercising cannot be performed during cold shutdowns. The flow rate required to full-stroke the valves would require injection into the RCS which could cause cold overpressurization of the RCS. As an alternative, these valves will be full-stroke exercised during refueling outages.

4.8.1.2.2 Evaluation. Valves V010, V020, V030, and V040 cannot be full-stroke exercised during power operation as SIS pressure cannot overcome RCS pressure. These valves cannot be full-stroke exercised during cold shutdown since this could result in a low temperature overpressurization of the RCS. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown, cooldown, and reactor head removal. Based on the impracticality of complying with the Code required testing frequency, and the licensee's proposed alternative testing frequency, relief from the Code requirements may be granted as requested.

4.9 Auxiliary Turbines System

4.9.1 Category C Valves

4.9.1.1 Relief Request. The licensee has requested relief from exercising main steam supply to the turbine driven auxiliary feedwater pump check valves V001, V002, V024, and V025 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve operability by testing each pair of check valves (V001 and V024; V002 and V025) as a single check valve.

4.9.1.1.1 Licensee's Basis for Requesting Relief. V001 and V024 are in series in one of the main steam supply lines to the auxiliary feedwater pump turbine. V002 and V025 are located in the opposite main steam supply line. Two check valves in a single line function as one for the purpose of maintaining a steam supply during a break. A closed check valve test cannot be performed on each valve due to there not being drain or test lines located between either pair of check valves. As an alternative, each pair of check valves will be tested as a single check valve.

4.9.1.1.2 Evaluation. A pair of check valves that are tested as one check valve does not verify that each of those valves is capable of performing its safety function. Check valve sample disassembly/inspection using a manual full-stroke of the disk is an acceptable alternative method to verify the full-stroke capability of check valves. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number, and materials of construction) and must have the same service conditions. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

A different valve of each group is required to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

Based on the determination that the Code requirements are not impractical and that a suitable method is available to full-stroke exercise these valves, relief should not be granted as requested.

4.10 Compressed Air System

4.10.1 Category A/C Valves

4.10.1.1 Relief Request. The licensee has requested relief from exercising containment instrument air supply check valve V204 in accordance with the requirements of Section XI, Paragraph IWV-3522 and has proposed to verify valve closure capability during 10 CFR 50, Appendix J, Type C, valve leak rate testing which is performed at least once per 2 years.

4.10.1.1.1 Licensee's Basis for Requesting Relief. When this valve is in operation there is no practical means to test valve closure. Valve closure cannot be verified due to system design. To perform a closure verification constitutes a leak test which presents a significant hardship during cold shutdown. Leak testing requires an extended period of time which causes extended outages of securing seal water injection to RCP seals, securing normal charging, securing component cooling water and securing instrument air. As an alternative, verification of valve closure will be done in conjunction with the 10 CFR 50, Appendix J, Type C, leak tests conducted at least once per 2 years.

4.10.1.1.2 Evaluation. Valve V204 cannot be closure verified during power operation or cold shutdown as the only method available to verify valve closure is valve leak testing. This valve is not equipped with valve position indication and some of the required test connections are located inside containment. Compliance with the Code required testing frequency would be burdensome since this would require quarterly plant shutdown and containment entry. Testing during cold shutdown could delay plant startup. Based on the impracticality of complying with the Code required testing method, the burden to the licensee of complying with the Code required testing frequency, and the licensee's proposed alternative testing, relief from the Code requirements may be granted as requested.

4.11 Diesel Generator System

4.11.1 Category B Valves

4.11.1.1 Relief Request. The licensee has requested relief from measuring the stroke time of diesel generators air start isolation valves PV-1A, PV-1B, PV-101A, and PV-101B in accordance with the requirements of Section XI, Paragraph IWV-3413 and has proposed to verify valve operability by measuring diesel start times and observing starting air tank pressure changes.

4.11.1.1.1 Licensee's Basis for Requesting Relief. Valve stroke time cannot be measured. These valves are solenoid operated and are enclosed with the solenoid. The valves have no position indication devices. These air start valves are required to start the associated diesel. Diesel start time is affected by valve stroke time. Valve degradation can be detected by ensuring the diesel comes up to speed in less than or equal to 12 seconds and by observing approximately equal pressure drops in the starting air tanks. Therefore, diesel start time and starting air tank pressure changes will provide indication of valve performance. As an alternative, proper operation of these valves will be verified by measuring diesel start times and observing starting air tank pressure changes.

4.11.1.1.2 Evaluation. Valves PV-1A, PV-1B, PV-101A, and PV-101B cannot be stroke timed due to the lack of position indication. Unsatisfactory stroke time of these valves will be indicated by the diesel generator failing to reach rated speed in less than 12 seconds and/or differences in air start tank pressures after diesel start. Conformance with the Code required testing method is impractical due to system design. Based on the impracticality of complying with the Code required testing method and the licensee's proposed alternative testing method, relief from the Code requirements may be granted as requested.

APPENDIX A

VALVES TESTED DURING COLD SHUTDOWN

APPENDIX A

VALVES TESTED DURING COLD SHUTDOWN

The following are Category A, B, C, and A/C valves that meet the exercising requirements of the ASME Code, Section XI, and are not full-stroke exercised every three months during plant operation. These valves are specifically identified by the Owner in accordance with Paragraphs IWV-3412 and -3522 and are full-stroke exercised during cold shutdowns and refueling outages. All valves in this Appendix have been evaluated and the reviewer agrees with the licensee that testing these valves during power operation is not possible due to the valve type and location or system design. These valves should not be full-stroke exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

1. MAIN STEAM SYSTEM

1.1 Category B Valves

Main steam isolation valves HV-11, HV-14, HV-17, and HV-20 cannot be exercised during power operation as the resultant severe main steam pressure transient would cause a plant shutdown. These valves will be partial-stroke exercised quarterly and full-stroke exercised during cold shutdowns and refueling outages.

2. MAIN FEEDWATER SYSTEM

2.1 Category B Valves

Feedwater isolation valves FV-39, FV-40, FV-41, and FV-42 cannot be exercised during power operation as the resultant stoppage of feedwater flow would cause an undesirable steam generator water level transient and possible plant shutdown. These valves will be partial-stroke exercised quarterly and full-stroke exercised during cold shutdowns and refueling outages.

2.2 Category C Valves

Feedwater check valves V-120, V-121, V-122, and V-123 cannot be exercised during power operation as the resultant stoppage of feedwater flow would cause an undesirable steam generator water level transient and possible plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Auxiliary feedwater check valves V-124, V-125, V-126, and V-127 cannot be exercised during power operation due to the resultant steam generator auxiliary feedwater nozzle thermal shock which could cause premature failure of the nozzles. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

3. AUXILIARY FEEDWATER SYSTEM

3.1 Category C Valves

Auxiliary feedwater discharge check valves V-030, V-033, V-036, V-042, V-045, V-048, V-054, V-057, V-062, V-067, and V-072 cannot be exercised during power operation due to the resultant steam generator auxiliary feedwater nozzle thermal shock which could cause premature failure of the nozzles. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

4. REACTOR COOLANT SYSTEM

4.1 Category A Valves

RCP seal supply isolation valves HV-8351A, HV-8351B, HV-8351C, and HV-8351D cannot be exercised during power operation due to possible RCP seal damage. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

RHR pump suction isolation valves PV-8702A and PV-8702B cannot be exercised during power operation due to their being interlocked closed when RCS pressure is greater than 360 psig to prevent overpressurization of the lower pressure RHR system. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

4.2 Category B Valves

RCP thermal barrier discharge isolation valves HV-13, HV-14, HV-15, and HV-16 cannot be exercised during power operation due to possible RCP thermal barrier or RCP seal damage. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Pressurizer power operated relief valves (PORVs) PCV-455A and PCV-456A should not be exercised during power operation since these valves have shown a high probability of sticking open and are not needed for overpressure protection during power operation. The NRC has concluded that routine exercising during power operation is "not practical" and, therefore, not required by IWV-3410.

The PORVs' function during reactor startup and shutdown is to protect the reactor vessel and coolant system from low temperature overpressurization conditions and should be exercised prior to initiation of system conditions for which vessel protection is needed. The following test schedule is required:

a. Full-stroke exercising should be performed at each cold shutdown or, as a minimum, once each refueling cycle. In case of frequent cold shutdowns, testing of the PORVs is not required more often than once each three months.

b. Stroke timing should be performed at each cold shutdown, or as a minimum, once each refueling cycle.

c. Fail-safe actuation testing should be performed at each cold shutdown.

Reactor vessel vent isolation valves HV-8001A, HV-8001B, HV-8001C, and HV-8001D cannot be exercised during power operation as opening the upstream valves would allow the downstream valves to "burp" reactor coolant into the containment atmosphere. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

4.3 Category C Valves

RCP thermal barrier supply check valves V-122, V-152, V-182, and V-212 cannot be exercised during power operation because interruption of RCP thermal barrier cooling water could result in RCP seal damage. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

5. CHEMICAL AND VOLUME CONTROL SYSTEM

5.1 Category A Valves

RCP seal leakoff return isolation valves HV-8100 and HV-8112 cannot be exercised during power operation due to possible RCP seal damage. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Letdown isolation valves HV-8152 and HV-8160 and charging pump discharge isolation valve HV-8105 cannot be exercised during power operation since failure in the closed position could result in loss of pressurizer level control and subsequent plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

5.2 Category B Valves

Charging pump discharge isolation valve HV-8106 cannot be exercised during power operation since failure in the closed position could result in loss of pressurizer level control and subsequent plant shutdown. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Volume control tank outlet isolation valves LCV-112B and LCV-112C cannot be exercised during power operation because any alternate charging pump suction source would adversely affect RCS boron concentration which could result in plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

5.3 Category C Valves

Boric acid transfer pumps discharge to charging pump suction check valve V-174 cannot be exercised during power operation as the alternate charging pump suction source would adversely affect RCS boron concentration which could result in plant shutdown. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

RCP seal supply check valve V-591 cannot be exercised closed during power operation since this would isolate RCP seal injection flow which could cause RCP seal damage. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

6. REFUELING WATER STORAGE SYSTEM

6.1 Category B Valves

SIS pumps miniflow isolation valve HV-8813 cannot be exercised during power operation as failure of this valve in the closed position could cause a failure of both SIS pumps. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Charging pump supply from the RWST isolation valves LCV-112D and LCV-112E cannot be exercised during power operation as failure in the open position could result in the introduction of borated water into the RCS which could cause a plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

7. RESIDUAL HEAT REMOVAL SYSTEM

7.1 Category A Valves

RHR suction from the RCS hot legs isolation valves HV-8701A and HV-8701B cannot be exercised during power operation due to their being interlocked closed when RCS pressure is greater than 360 psig to prevent overpressurization of the lower pressure RHR system. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

7.2 Category B Valves

RHR discharge isolation valves HV-8809A and HV-8809B and hot leg recirculation isolation valve HV-8840 cannot be exercised during power operation as these valves have their operator power removed so that the emergency core cooling flowpath can be maintained operable as required by Technical Specifications. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

RHR crossconnect isolation valves HV-8716A and HV-8716B cannot be exercised during power operation as failure in the closed position would render both trains of the RHR system inoperable which would require plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

RHR to SIS isolation valves HV-8804A and HV-8804B cannot be exercised during power operation as failure in the closed position would render both emergency core cooling system trains inoperable which would require plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Sump isolation valves HV-8811A and HV-8811B cannot be exercised during power operation as failure in the open position would render the associated RHR train inoperable due to diversion of RCS water to the containment sump and would require plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

7.3 Category C Valves

RHR discharge check valves 8730A and 8730B cannot be exercised during power operation as the RHR pumps cannot overcome RCS pressure. These valves will be partial-stroke exercised quarterly and full-stroke exercised during cold shutdowns and refueling outages.

7.4 Category A/C Valves

Hot leg recirculation check valves 8841A and 8841B cannot be exercised during power operation as the RHR pumps cannot overcome RCS pressure. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

8. HIGH PRESSURE COOLANT INJECTION SYSTEM

8.1 Category B Valves

SIS discharge isolation valves HV-8802A and HV-8802B and discharge to accumulator isolation valve HV-8835 cannot be exercised during power operation as these valves have their operator power removed so that the emergency core cooling flowpath can be maintained operable as required by Technical Specifications. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

9. ACCUMULATOR SAFETY INJECTION SYSTEM

9.1 Category B Valves

Accumulator discharge isolation valves HV-8808A, HV-8808B, HV-8808C, and HV-8808D cannot be exercised during power operation as these valves are locked open with operator power removed when RCS pressure is above 1000 psig as required by Technical Specifications. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Accumulator vent isolation valves HV-8950A, HV-8950B, HV-8950C, HV-8950D, HV-8950E, and HV-8950F cannot be exercised during power operation as failure in the open position during testing would render the associated accumulator inoperable. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

9.2 Category A/C Valves

RHR to cold leg check valves 8818A, 8818B, 8818C, and 8818D cannot be exercised during power operation as the RHR pumps cannot overcome RCS pressure. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

10. COMPRESSED AIR SYSTEM

10.1 Category A Valves

Containment isolation valve FV-29 cannot be exercised during power operation as failure in the closed position would cause a loss of containment instrument air which would result in loss of letdown capability due to loss of valve control air which could cause a loss of pressurizer level control and subsequent plant shutdown. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

10.2 Category B Valves

Hydrogen control system make up air isolation valve HV-30 cannot be exercised during power operation as failure in the open position would result in diversion of containment instrument air and a subsequent loss of plant letdown capability which could cause a loss of pressurizer level control and subsequent plant shutdown. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

APPENDIX B

P&ID LIST

APPENDIX B

P&ID LIST

The P&IDs listed below were used during the course of this review.

System	P&ID	Revision
Main Steam System	M-12AB01	0
	M-12AB02	0
Feedwater System	M-02AE01	15
	M-02AE02	13
Auxiliary Feedwater System	M-02AL01	15
Condensate Storage and Transfer System	M-02AP01	13
Reactor Coolant System	M-02BB01	15
	M-02BB02	18
	M-02BB03	12
	M-02BB04	6
Chemical and Volume Control System	M-02BG01	12
	M-02BG02	14
	M-22BG03	2
	M-02BG04	11
	M-02BG05	14
Reactor Make-up Water System	M-12BL01	0
Steam Generator Blowdown System	M-02BM01	13
Borated Refueling Water Storage System	M-12BN01	0
Fuel Pool Cooling and Clean-up System	M-02EC01	10
	M-02EC02	10
Essential Service Water System	M-K2EF01	12
	M-02EF01	10
	M-02EF02	11
Component Cooling Water System	M-02EG01	11
	M-02EG02	14
	M-02EG03	15
Residual Heat Removal System	M-02EJ01	17

System	P&ID	Revision
High Pressure Coolant Injection System	M-02EM01 M-12EM02	8 0
Containment Spray System	M-02EN01	6
Accumulator Safety Injection System	M-02EP01	13
Auxiliary Turbines-Auxiliary Feedwater Pump Turbine	M-02FC02	13
Containment Hydrogen Control System	M-02GS01	8
Containment Purge System	M-02GT01	17
Liquid Radwaste System	M-02HB01	16
Decontamination System	M-02HD01	5
Emergency Fuel Oil System	M-02JE01	0
Compressed Air System	M-12KA01 M-02KA02 M-02KA05	0 11 5
Breathing Air System	M-12KB01	0
Fire Protection System	M-02KC02	12
Standby Diesel Generator System	M-02KJ01 M-02KJ02 M-02KJ03 M-02KJ04 M-02KJ05 M-02KJ06	5 10 5 5 9 4
Auxiliary Building and Equipment Drain System	M-02LF03	6
Reactor Building and Hot Machine Shop Floor and Equipment Drain System	M02LF09	12
Nuclear Sampling System	M-02SJ01 M-02SJ04	12 4
Service Gas System	M-02KH02	6

APPENDIX C

IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

APPENDIX C

IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

Inconsistencies and omissions in the licensee's program noted during the course of this review are summarized below. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

1. Valves KJ-V711A, V711B, V712A, and V712B, diesel generator air compressor to air receiver checks are not passive check valves and should be included in the IST program as active valves and tested to the requirements of the Code.

2. Valves BB HV-8026 and BB HV-8027, nitrogen supply to the pressure relief tank isolations are not passive valves and should be included in the IST program as active valves and tested to the requirements of the Code.

3. Valves BM HV-19, HV-20, HV-21, and HV-22, steam generator sample isolations are not passive valves and should be included in the IST program as active valves and tested to the requirements of the Code.

4. Valve EM-V006, accumulator fill check is not a passive check valve and should be included in the IST program as an active valve and tested to the requirements of the Code.

5. Valve EP-V046, accumulator nitrogen supply check is not a passive check valve and should be included in the IST program as an active valve and tested to the requirements of the Code.

6. Valves KA-V648, V649, V650, and V651, steam dump nitrogen accumulators checks are not passive check valves and should be included in the IST program as active valves and tested to the requirements of the Code.

7. Valves BB HV-8000A and HV-8000B, PORV isolations are not passive valves and should be included in the IST program as active valves and tested to the Code requirements.

8. Valve relief request No. 22 requests relief from the corrective action requirement of measuring degraded and increasing valve stroke times monthly for valves identified as being tested on a cold shutdown frequency (Appendix A of this report). The licensee wishes to test cold shutdown frequency tested degraded valves that are not being repaired, during cold shutdown rather than monthly as the monthly testing would not be applicable. Relief should not be granted as corrective action requires that the degraded valves be repaired, and not just left in the degraded condition while being tested on a cold shutdown frequency (see section 4.1.1.1 of this report).

9. Valve relief request No. 9 requests relief from full-stroke exercising valves BB-8948A, 8948B, 8948C, and 8948D, RCS cold leg injection checks. The NRC has identified sample disassembly/inspection as a suitable means to full-stroke exercise check valves (section 4.2.2.4.2 of this report) and this method can be utilized to full-stroke exercise these valves. Relief should not be granted for this request (section 4.2.2.4 of this report) and the licensee should full-stroke exercise these valves.

10. Valve relief request No. 17 requests relief from full-stroke exercising valves EN-V003, V004, V009, and V010, refueling water storage tank to spray header checks. The NRC has identified sample disassembly/inspection as a suitable means to full-stroke exercise check valves (section 4.2.2.4.2 of this report) and this method can be utilized to full-stroke exercise these valves. Relief should not be granted for this request (section 4.7.1.2 of this report) and the licensee should full-stroke exercise these valves.

11. Valve relief request No. 14 requests relief from full-stroke exercising valves EP-8956A, 8956B, 8956C, and 8956D, accumulator discharge checks. The NRC has identified sample disassembly/inspection as a suitable means to full-stroke exercise check valves (section 4.2.2.4.2 of this report) and this method can be utilized to full-stroke exercise these valves. Relief should not be granted for this request (section 4.8.1.1 of this report) and the licensee should full-stroke exercise these valves.

12. The licensee's proposal to verify closure of FC-V001, V024, V002, and V025, series checks in the steam supply to the turbine driven auxiliary feedwater pump, together in pairs of two valves, is not acceptable. The Code requires that each valve that performs a safety function be individually exercised to the position required to fulfill its function. Testing two series valves as a pair can only verify that at least one of the valves is closed but cannot provide any indication of which valve is closed or the condition of the other valve. The NRC has identified sample disassembly/inspection as a suitable means to full-stroke exercise check valves (section 4.2.2.4.2 of this report) and this method can be utilized to individually closure verify these valves. Relief should not be granted for this request and the licensee should individually verify these check valves in the closed position as required by the Code (section 4.9.1.1 of this report).

13. Valve relief request No. 1 requests relief from the IWV-3415 requirement of fail-safe testing power operated valves. The method the licensee is utilizing to fail-safe test these valve does meet the Section XI requirements, therefore, relief is not necessary and this relief request should be deleted.

14. Valves relief request No. 5 requests relief for containment isolation valves. The licensee proposed to leak rate test these valves in accordance with 10 CFR 50, Appendix J requirements in lieu of the requirements of Section XI, IWV-3421 through IWV-3425. This is acceptable, however, in order to be granted this relief, the licensee must also comply with the requirements of Section XI, IWV-3426 and IWV-3427 (Section 4.1.2.1 of this report).

15. The licensee has proposed to full-stroke exercise containment spray system sump isolation valves HV-1 and HV-7 during cold shutdown but has not provided sufficient technical justification to do so. These valves should be full-stroke exercised quarterly as required by the Code.

16. Pump relief request No. 8 requests relief from measuring boric acid transfer and emergency fuel oil transfer pumps flow due to flow instruments not being installed. The lack of installed instrumentation does not negate the requirement to measure flow for these safety related pumps (section 3.3.2 of this report). Relief should not be granted for this request and the licensee should install the required instrumentation in a timely manner in order to measure the Code required parameters.

17. Pump relief request No. 5 requests relief from observing lubricant level or pressure for the boric acid transfer pumps and the emergency fuel oil transfer pumps as these pumps are canned motor pumps and are lubricated by their process fluid. Since a lubricant level or pressure cannot be observed for these pumps, relief is not necessary and this relief request should be deleted.

18. Pump relief request No. 11 requests relief from the Table IWP-3100-2 requirements for flowrate and differential pressure for the listed pumps and proposes to delete the Required-action range (high) limit and to raise the Alert-range (high) limit to 105 percent of reference value for these pumps (see section 3.5.2 of this report). The licensee has not provided sufficient technical justification to demonstrate the impracticality of the Code requirements. Relief should not be granted for this request.

19. Pump relief request No. 1 requests relief from the annual pump bearing temperature measurement as required by Table IWP-3100-1. The licensee has not demonstrated the impracticality of this Code required measurement for all pumps in the program (see section 3.1.1 of this report). However, relief may be granted only for those pumps whose bearing do not have permantly installed temperature monitoring devices and/or are not accessible for measurement with a portable temperature measuring device.