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TECHNICAL EVALUATION REPORT
PUMP AND VALVE INSERVICE TESTING PROGRAM
COOPER NUCLEAR STATION

Docket No. 50-298

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ABSTRACT

This EG&G Idaho, Inc., report presents the results of our evaluation of the Cooper Nuclear 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 (III)" being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Mechanical Engineering Branch, by EG&G Idaho, Inc., NRR and I&E Support.

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1. INTRODUCTION

Contained herein is a technical evaluation of the pump and valve inservice testing (IST) program submitted by the Nebraska Public Power District (NPPD) for its Cooper Nuclear Station.

By a letter dated June 15, 1984, NPPD submitted an IST program for Cooper Station. The working session with NPPD and Cooper representatives was conducted on April 15 and 16, 1986. The licensee's revised program, as attached to his letter to NRC, dated July 30, 1986, which supersedes all previous submittals, was reviewed to verify compliance of proposed tests of Class 1, 2, and 3 safety-related pumps and valves with the requirements of the ASME Boiler and Pressure Vessel Code (the Code), 1980 Edition, through the Winter of 1981 Addenda.

Any IST program revisions subsequent to those noted above are not addressed in this technical evaluation report (TER). It is an NRC staff position that required program changes, such as 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 submittal NPPD has requested relief from the ASME Code testing requirements for specific pumps and valves and these requests have been evaluated individually to determine whether they are indeed impractical. This review was performed utilizing the acceptance criteria of the Standard Review Plan, Section 3.9.6, and the Draft Regulatory Guide and Value/Impact Statement titled "Identification of Valves for Inclusion in Inservice Testing Programs." These 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 Nebraska Public Power District bases for requesting relief from the Section XI requirements for the Cooper Nuclear Station pump testing program and EG&G's evaluations and conclusions regarding these requests. Similar information is presented in Section 4 for the valve testing program.

Category A, B, and 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 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 Cooper Nuclear Station inservice testing (IST) program for pumps and valves was begun in January of 1986. The program 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 are 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, the licensee was requested to explain the inconsistency for the Request for Additional Information (RAI) document that served as the agenda for the working meeting between the licensee, the NRC, and the EG&G reviewers. 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-3610.

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 that 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 April 15 and 16, 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 proposed 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 July 30, 1986, 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.

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

3. PUMP TESTING PROGRAM

The Cooper Station IST program submitted by Nebraska Public Power District 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 Nebraska Public Power District basis for requesting relief from the pump testing requirements and the reviewer's evaluation of that request is summarized below.

3.1 All Pumps in the IST Program

3.1.1 Bearing Temperature Measurement

The licensee has requested relief from measuring bearing temperature annually on all pumps in the IST program in accordance with the requirements of Section XI, Paragraph IWP-3300, and proposed to measure vibration to monitor bearing degradation.

3.1.1.1 Licensee's Basis for Requesting Relief. Bearing temperature measurements will not provide significant additional information regarding bearing condition than that already obtained by measuring vibration amplitude. Measurement of vibration amplitude provides more concise and consistent information with respect to pump and bearing condition. The usage of vibration amplitude measurements can provide information as to a change in the balance of rotating parts, misalignment of bearings, worn bearings, coupling misalignment, changes in internal hydraulic forces and general pump integrity prior to the pump condition degrading to the point where the component is jeopardized. Bearing temperature does not always predict such problems. An increase in bearing temperature most often does not occur until the bearing has deteriorated to a point where additional pump damage may occur. Bearing temperatures are also affected by the temperatures of the medium being pumped, which could yield misleading results.

Vibration readings are not affected by the temperature of the medium being pumped, thus the readings are more consistent. As described in relief request RP-04 unfiltered vibration velocity amplitude measurements will be made in inches/second rather than mils displacement amplitude measurement, with the exception of standby liquid control pumps 1A and 1B, which will be measured in mils displacement due to their low rotating speed. This will provide a more sensitive determination of abnormal conditions. In addition, it is impractical to measure bearing temperatures on many of the pumps in the program. Some specific examples are as follows:

a. Service Water Pumps: There is no installed instrumentation to measure bearing temperature. Also, pump bearings are under water and, therefore, inaccessible.

b. Standby Liquid Control Pumps: There is no installed instrumentation to measure bearing temperature. Bearings are inaccessible for direct measurement due to the location of the bearing within the housing. Bearings are in an oil bath which is inaccessible.

c. High Pressure Coolant Injection:

Booster Pump - There is no installed instrumentation to measure bearing temperature. The booster pump bearings are anti-friction roller bearings. This type of bearing will not typically show a significant rise in temperature just before failure, as is the case with journal bearings.

Main Pump - Instrumentation to measure thrust and journal bearing temperatures is installed on the main pump. However, the HPCI unit cannot be operated for extended time periods in order to meet the acceptance criteria of IWP-3500, due to suppression pool temperature considerations.

d. Residual Heat Removal Pumps: These pumps utilize lower shaft guide bearings which are lubricated by medium pumpage. These bearings are in the main flow path and are therefore exempt per IWP 4310.

Alternative Test:

Unfiltered vibration velocity measurements will be taken quarterly to assess overall pump condition on all pumps except SLC pumps 1A and 1B. Unfiltered mils displacement readings will be taken on these pumps due to their low rotating speed.

3.1.1.2 Evaluation. The annual bearing temperature measurement is an unreliable method of detecting bearing failure for the reasons discussed above and deletion of this measurement will not affect the licensee's pump monitoring program. The burden on the licensee if the Code requirements were imposed would not be justified by the limited information that would be provided about pump mechanical condition. However, it should be noted that the licensee has not identified the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, and the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B, as being included in this relief request or if relief from the bearing temperature measurement is necessary. The licensee should correct this discrepancy between the relief request and the body of the pump testing program. This correction will be a simple editorial change on the licensee's part because the relief request addresses all pumps in the IST program.

Based on the impracticality of complying with the Code and the burden on the licensee if the Code requirements were imposed and considering the quarterly pump vibration measurements that will be taken to determine pump mechanical condition and to detect pump bearing degradation, relief may be granted from the Section XI requirement of annually measuring bearing temperature for these pumps.

3.1.2 Vibration Measurements

The licensee has requested relief from measuring vibration amplitude on all pumps in the IST program, except the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B, and the standby liquid control pumps, SLC-1A and -1B, in accordance with the requirements of Section XI, Paragraphs IWP-3100 and -4510, and proposed to measure vibration velocity during pump tests.

3.1.2.1 Licensee's Basis for Requesting Relief. IWP-4510 infers that an unfiltered displacement reading be taken which will be the sum of the individual vibrations occurring at different frequencies. This method evaluates displacement only and does not account for frequencies at which the displacements are occurring. This is significant because, for example, a vibration of five mils occurring at 10,000 cycles per second (cps) is much more severe than a vibration of five mils occurring at 1,000 cps.

Alternative Test:

The District proposes that vibration severity for the above pumps be determined by measuring vibration velocity (V_v), which is a function of both displacement and frequency.

Acceptable, Alert, and Required Action ranges will be established using a combination of the "General Machinery Vibration Severity Chart" published by the American Society of Mechanical Engineers (67-PEM-14) and from twelve years of proven satisfactory plant operating experience. The Section XI allowable ranges of vibration as given in Table IWP-3100-2 are based on pump reference values. The District's proposed method will use absolute ranges which are independent of the original reference value.

Accordingly, the specific action ranges for pump vibration velocity (V_v inches/sec.) in lieu of Section XI ranges will be as follows:

Acceptable Range: $V_v \leq .235$ in/sec.

Alert Range: $.235$ in/sec $< V_v \leq .450$ in/sec

Required Action Range: $V_v > .450$ in/sec

Again, this is based on proved satisfactory experience. For example, reference values for the subject pumps at Cooper Nuclear Station typically range from 0.10 in/sec to 0.15 in/sec. An increase in a vibration level from 0.10 in/sec to the upper limit of the proposed acceptable range of 0.235 in/sec is a 135% increase in vibration severity which meets or exceeds the 140% to 200% increase allowed by Section XI, Table IWP-3100-2.

It should be noted that the required IST vibration data taken and recorded are only a small portion of the station vibration monitoring program. Evaluations far and above the minimum requirements of Subsection IWP are performed routinely on the above pumps. These evaluations include monthly observation of multiple (not just single IST) vibration points and periodic real-time analysis of multiple pump vibration points over a broad range of frequencies. Further information on this program is available upon request. The District contends that the proposed alternative testing will meet or exceed the Section XI requirement to assess pump operability and operational readiness.

Vibration data will be evaluated in units of inches/sec. using the above action ranges.

3.1.2.2 Evaluation. Measurement of vibration velocity is an acceptable alternate method to utilize to assess pump vibration, however, the licensee has not supplied sufficient technical information that justifies acceptable vibration readings in the "Rough" range of the "General Machinery Severity Chart." Also, the licensee's proposal to utilize absolute vibration ranges instead of vibration reference values and associated limits is unacceptable because a vibration reading could

increase much more than the range allowed by the Code, go undetected, and no corrective action would be taken.

One acceptable alternative to the vibration monitoring required by Section XI and to the licensee's proposal is contained in "An American National Standard, In-Service Testing of Pumps, ANSI/ASME OM-6-1986, Draft 8." The licensee may revise the IST program to include all the vibration velocity testing guidance contained in OM6-1986, Draft 8, if velocity measurements are to be utilized in lieu of the amplitude measurements required by Section XI because the NRC staff has reviewed those ranges and limits and found them to be an acceptable alternative to those contained in Section XI. It should be noted that the remainder of OM-6, Draft 8, has not received a detailed review and, therefore, should not be referenced as the guidance document for the IST program.

The licensee has not included the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D or the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B, in this relief request or in the vibration monitoring program. Vibration measurements should be taken during tests of these pumps. It should be noted that the licensee has stated that vibration amplitude measurements will be taken during tests of the standby liquid control pumps, SLC-1A and -1B. (See Item 3.1.1)

Based on the considerations discussed above, the licensee may perform the following:

Revise the IST program to agree with the vibration velocity testing guidance of OM-6, Draft 8, and to provide the NRC staff with this information in the form of a relief request that must subsequently be reviewed and approved before implementation.

Additionally, the licensee should establish and conduct a vibration monitoring program for the reactor equipment cooling pumps and the diesel generator fuel oil transfer pumps.

Since the licensee has not satisfactorily demonstrated the impracticality of performing vibration measurements in accordance with the Code nor demonstrated that the proposed alternate technique is at least equivalent to the requirements of the Code, relief should not be granted from the requirements of Section XI. If the licensee chooses to revise the IST program to include the vibration velocity testing guidance of OM-6, Draft 8, then relief may be granted from the requirements of Section XI.

3.2 Standby Liquid Control System

3.2.1 Relief Request

The licensee has requested relief from measuring inlet pressure and differential pressure on the standby liquid control pumps, SLC-1A and -1B, in accordance with the requirements of Section XI, Paragraph IWP-3100.

3.2.1.1 Licensee's Basis for Requesting Relief. It is impractical to measure standby liquid control pump inlet pressure (thus making pump differential pressure impractical) in accordance with Section XI requirements. During pump testing, the pump suction is from a test tank rather than the main standby liquid control tank. The only means available to measure inlet pressure is to correlate tank level to inlet pressure These pumps are positive displacement and the measurement of inlet pressure is not critical in judging pump performance. Measuring the discharge pressure and the flow rate is adequate to detect changes in the hydraulic characteristics of the pumps.

Alternative Test:

Monitor pump discharge pressure and pump flow rate at each Inservice Test.

3.2.1.2 Evaluation. These are positive displacement pumps and changes in the inlet pressure have no effect on the flow rate or the discharge pressure. For this reason, calculating or measuring inlet or

differential pressure would not contribute meaningful data to utilize in monitoring pump degradation.

The proposed alternate testing of measuring pump discharge pressure and flow rate should provide sufficient information to adequately monitor the hydraulic condition of these pumps and relief may be granted from the requirements of Section XI to measure inlet and differential pressure during pump tests. The burden on the licensee would not be justified by the limited information that would be provided concerning pump mechanical condition if the Code requirements were imposed.

3.3 High Pressure Coolant Injection System

3.3.1 Relief Request

The licensee has requested relief from adjusting the variable speed high pressure coolant injection turbine and pump, HP-1, to the reference speed in accordance with Section XI, Paragraph IWP-3100, and proposed to duplicate a specified pump discharge pressure and flow rate during pump tests.

3.3.1.1 Licensee's Basis for Requesting Relief. Currently, the HPCI pump is tested by duplicating a specified flow and pump discharge pressure, and comparing the resultant pump speed to a reference pump speed. This test method is preferred because it requires operator regulation of only one parameter, pump discharge pressure (flow automatically controlled). This minimizes the duration of the test surveillance and therefore minimizes suppression pool heat-up.

Conversely, testing in accordance with code requirements requires operator regulation of two test parameters simultaneously (pump speed and discharge pressure) with resultant flow being compared to a reference flow. Operator manipulation of two test parameters to duplicate a third parameter for the duration of the test is not considered feasible by the District.

Alternative Test:

Duplicate specified flow and pump discharge pressure and compare resultant pump speed to a reference speed. The District will determine the limits for acceptable operation.

3.3.1.2 Evaluation. The licensee has not provided a technical justification for not establishing and duplicating a reference speed during tests of the high pressure coolant injection pump. The turbine reference speed should be reproduced during pump tests in order to more accurately duplicate pump differential pressure and flow rate values for use in assessing the hydraulic performance of this pump. Also, testing the high pressure coolant injection pump in accordance with Section XI and duplicating the reference values of the test quantities as required will not add significantly to the length of the test.

The licensee has not demonstrated the impracticality of duplicating a turbine reference speed, therefore, the licensee should test the high pressure coolant injection pump in accordance with Paragraph IWP-3100 which includes Table IWP-3100-2, "Allowable Ranges of Test Quantities," and relief should not be granted from the requirements of Section XI as requested.

3.4 Service Water System

3.4.1 Relief Request

The licensee has requested relief from measuring vibration on the service water pumps, SW-1A, 1B, -1C, and -1D, in accordance with the requirements of Section XI, Paragraph IWP-3100, and proposed to measure vibration at the motor bearings.

3.4.1.1 Licensee's Basis for Requesting Relief. The pump casings are physically located underwater and, therefore, inaccessible.

Alternative Test:

Measure pump motor vibration at the upper and lower bearings.

3.4.1.2 Evaluation. Due to pump design, instrumentation is not installed to allow vibration measurements and, since these pumps are submerged and inaccessible, portable instrumentation cannot be utilized during testing. Measuring vibration at the upper and lower motor bearings should provide a reasonable indication of pump degradation.

The licensee has indicated in the body of the pump testing program that inlet pressure is measured and that lubricant level is observed during tests of these pumps, however, they have failed to describe how that is done because these pumps are submerged in the intake bay and that bay is open to the river. Due to the design and location of these pumps, observation of lubricant level and measurement of inlet pressure during pump testing is impractical. The licensee should provide the NRC staff with a relief request that describes the alternate testing being performed, if any.

Based on the impracticality of measuring vibration at the submerged pump, the proposed alternate testing of measuring pump vibration at the upper and lower motor bearings should provide an indication of pump degradation and, therefore, relief may be granted from the direct contact vibration measurement requirements of Section XI as requested.

3.5 Reactor Equipment Cooling System

3.5.1 Relief Request

The licensee has requested relief from testing the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, in accordance with the requirements of Section XI, Paragraph IWP-3400, and proposed to test them in accordance with station surveillance procedures.

3.5.1.1 Licensee's Basis for Requesting Relief. Three pumps are typically in service 100% of the time. Running pumps are shifted daily to distribute operation. Readings and observations of each pump are taken daily and during pump shifts.

Surveillance Procedure 6.3.16.1 requires monthly testing of these pumps. Since these pumps are essentially inservice continuously and operability evaluated monthly, additional Section XI testing would offer no benefits.

Alternative Test:

Daily pump operational evaluation and monthly testing (per Surveillance Procedure 6.3.16.1) will serve in lieu of Section XI testing.

3.5.1.2 Evaluation. The licensee has provided no technical information that describes the testing that will be performed in lieu of the testing required by Section XI or if the alternate testing is equivalent to the requirements of Section XI. The licensee has stated that these pumps are usually in operation and that additional testing need not be performed because they are frequently operated. This position is in agreement with Paragraph IWV-3400(b) which states that pumps that are operated more frequently than quarterly need not be run or stopped for special tests, however, that Paragraph also states that the pumps must have been run at the reference conditions at least once quarterly and the specified quantities measured, observed, recorded, and analyzed. The licensee has provided no information that indicates that this Code requirement will be satisfied.

The licensee has not demonstrated the impracticality of testing these pumps in accordance with the Code, therefore, the licensee should test these pumps in accordance with the requirements of Section XI and relief should not be granted.

3.6 Diesel Generator Fuel Oil Transfer System

3.6.1 Relief Request

The licensee has requested relief from testing the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B, in accordance with the requirements of Section XI, Paragraph IWP-3100, and proposed to test them in accordance with station surveillance procedures.

3.6.1.1 Licensee's Basis for Requesting Relief. Cooper Nuclear Station Technical Specification 4.9.A.2.a requires that a monthly test of each diesel generator be performed and that the operation of the diesel fuel oil transfer pumps and fuel oil day tank level switches be demonstrated. If this test is not completed satisfactorily, the diesel generator is declared inoperable and a limiting condition of operation is entered requiring either equipment repair within a specified time or plant shutdown.

These pumps are operated to refill the fuel oil day tanks every month during Surveillance Procedure 6.3.12.1 testing. Additionally, each pump is functionally evaluated each refueling cycle during DG-FOT pump testing per Surveillance Procedure 6.3.12.8. Pump failure during the above testing would require corrective actions to ensure fuel oil supply specifications are met.

Alternative Test:

> In lieu of Section XI testing, current CNS Surveillance Procedure testing will serve to assess pump operational readiness. CNS Surveillance Procedures will meet or exceed Section XI requirements.

3.6.1.2 Evaluation. The licensee has provided no technical information that describes the testing that will be performed in lieu of the testing required by Section XI or if that alternate testing meets the requirements of Section XI. The licensee's basis seems to indicate that the only method used for detecting pump degradation is complete failure of

the pump and that no attempt is made to reproduce the required reference pump parameters to utilize in monitoring pump degradation so that reasonable operational readiness can be assured.

The licensee has not demonstrated the impracticality of testing these pumps in accordance with the Code, therefore, the licensee should test these pumps in accordance with the requirements of Section XI and relief should not be granted.

4. VALVE TESTING PROGRAM

The Cooper Nuclear Station IST program submitted by Nebraska Public Power District was examined to verify that all valves included in the program are subjected to the periodic test required by the ASME Code, Section XI, 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 and established NRC positions. Each Nebraska Public Power District 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 Containment Isolation Valves

4.1.1.1 Relief Request. The licensee has requested relief from leak testing all primary containment isolation valves in accordance with the requirements of Section XI Paragraphs IWP-3420 through -3425, and proposed to leak test these valves in accordance with 10 CFR 50, Appendix J.

4.1.1.1.1 Licensee's Basis for Requesting Relief--The pressure decay method at initial pressure of 58 psig is suitable for measuring air or nitrogen leakage. The test method is one of the methods contained in 10 CFR 50, Appendix J. The basis for the leakage formula is the ideal gas laws. The MSIVs are tested at 29 psig, as exemption from 10 CFR 50, Appendix J, granted previously per Amendment 44 of DPR 46.

Specific allowable leakage rates for individual valves were established from baseline data when the valves were new and an appropriate range established. Technical Specifications established total allowable leakage at .6La, 189 scfh. This total does not include the MSIVs. This number is based on air as the test media and use of the pressure decay

method. See attachment for comparison of Surveillance Procedure 6.3.1.1 leakage rates and ASME XI leakage rates. (The attachment is Paragraph A and B under "Alternative Test.")

Alternative Test:

Use the pressure decay method to determine seat leakage. All valves tested at initial pressure of 58 psig with the exception of the MSIVs, which are tested at 29 psig, as previously mentioned. See attachment for basis and procedure for "Pressure Decay Method".

Maximum individual valve leakage rates will be per surveillance Procedure 6.3.1.1 with total leakage governed by Station Technical Specifications.

A. The pressure decay method is suitable for measuring air to nitrogen leakage. The procedure for performing the test is as follows:

1. Connect the test apparatus to the test connection.

2. Pressurize the test volume to 58 psig with air; then isolate the test volume from the air supply.

3. Record the pressure in the test volume at regular intervals.

4. The leakage of the test volume is calculated as follows:

$$L = \frac{dP}{dt} \frac{V}{Ps} \quad 60$$

L = leakage in scf/hr

$\frac{dP}{dt}$ = the slope of a plot of the pressure vs. time data (psi/min)

V = the volume of the test volume (ft^3)

Ps = standard pressure (14.7 psia)

60 = constant to convert scf/min to scf/hr

B. The test method is one of the methods contained in 10 CFR 50, Appendix J. The basis for the formula is the gas laws.

$$PV = \frac{m}{M} RT$$

where

P = pressure

V = volume

m = mass

M = molecular weight

R = universal gas constant

T = temperature (of test fluid)

Ps = standard pressure (14.7)

Ts = standard temperature.

$$m = \frac{PVM}{RT}$$

$\frac{dm}{dt} = \frac{(VM)}{(RV)} \frac{(dP)}{(dt)}$ Assume temperature is stable and does not vary with time. Temperature is stabilized prior to taking data.

Leakage is equal to the change in mass with respect to time.

Leakage = $\frac{dm}{dt} \frac{(RTs)}{(MPs)}$ Constants for standard pressure, temperature, etc.

Leakage = $\frac{RT}{MP} \frac{1}{RT} \frac{DP}{dt}$

Leakage = $\frac{530}{T} \frac{M}{M} \frac{gas}{air} \frac{V}{14.7} \frac{dP}{dt} 60$

Assume T is greater than 70°F, which it is at CNS, so the first term drops out. The test media is air so the second term drops out, which leaves us the following:

Leakage = $\frac{V}{14.7} \frac{dP}{dt} 60$

4.1.1.1.2 Evaluation--The leak test procedures and requirements for containment isolation valves identified by 10 CFR 50, Appendix J, essentially meet the Section XI Code requirements since it incorporates all of the major elements of Paragraphs IWV-3421 through -3425. Appendix J, Type C, leak rate testing adequately determines the leak-tight integrity of these valves. The 10 CFR 50, Appendix J, leak rate testing does not trend or establish corrective actions based on individual valve leakage rates, therefore, the Analysis of Leakage Rates and Corrective Action requirements of Section XI, Paragraphs IWV-3426 and -3427, must be followed.

The alternate method of leak testing containment isolation valves in accordance with the requirements of 10 CFR 50, Appendix J, is acceptable and, therefore, relief may be granted from the requirements of Section XI, Paragraphs IWV-3420 through -3425.

4.1.2 Category A/C Excess Flow Check Valves

4.1.2.1 Relief Request. The licensee has requested relief from the exercising and leak testing requirements of Section XI, Paragraphs IWV-3400, -3420, and -3520, for all excess flow check valves and proposed to test these valves in accordance with Technical Specification 4.7.D.1.d.

4.1.2.1.1 Liconsee's Basis for Requesting Relief--Uninterrupted function of these valves is essential for continuous monitoring of reactor plant parameters and is hence necessary for proper plant operation. Routine testing in accordance with Section XI would cause instrument line interruptions. This would disable instruments required for safe plant operations, safety-system actuation, reactor shutdown, or sensing accident conditions.

The excess flow check valves are tested using a modified leak-rate test to assess operability. Testing is performed at least once each operation cycle per Surveillance Procedure 6.3.10.2 and Technical

Specification 4.7.D.1.d. Testing more frequently could jeopardize the safety of the reactor.

Alternative Test:

In lieu of Section XI testing, a modified leak-rate test will be performed. Surveillance Procedure 6.3.10.2 meets or exceeds the intent of Section XI for testing excess flow check valves.

4.1.2.1.2 Evaluation--These valves cannot be exercised during power operation because various instrument sensing lines must be disconnected thus removing multiple reactor instrumentation from service. Those instruments provide reactor protection and control signals and cannot be removed from service without a possible reactor trip. Additionally, these valves cannot be exercised during cold shutdown because removal of multiple instruments from service could prevent operation of systems required for decay heat removal.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, full-stroke exercising these valves during the performance of a modified leak rate test during refueling outages when multiple reactor protection and control instrumentation can be removed from service should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.2 Core Spray System

4.2.1 Category C Valves

4.2.1.1 Relief Request. The licensee has requested relief from exercising valves CS-CV-12, -13, -14, and -15, core spray pressure maintenance supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify closure of at least one valve in each pair of series valves quarterly.

4.2.1.1.1 Licensee's Basis for Requesting Relief--These valves are normally open check valves (with 2 in series). They are required to be open to keep the CS system in a solid standby condition. When the CS pumps start, these valves should close to ensure maximum flow to the test loop or reactor.

Surveillance Procedure 6.3.4.1 for CS pump testing provides adequate testing to verify the open position for these valves. Prior to pump testing, system vent valves are opened and flow is observed. This flow will verify the pressure maintenance valves are open and operating properly. This is required by Technical Specification 4.5.G.1.

When a CS pump is started, required CS pump flow rate and discharge pressure would verify one of the two valves in series per loop has closed. Corrective action would be required if pump parameters were not within specification. In addition, should both valves fail to close, a relief valve would lift or a pressure sensor would alarm on the condensate supply side of the valves. The current system design does not allow to ensure both valves have closed.

Alternative Test:

In lieu of Section XI valve testing, current CNS Surveillance Procedure testing will serve to assess valve operational readiness.

4.2.1.1.2 Evaluation--Due to present system configuration, these valves cannot be exercised closed individually. Also, they are not equipped with sufficient test connections or position indication to verify closure individually. The licensee's proposal to verify closure of at least one of the two valves in series in each pressure maintenance line by verifying that the upstream relief valve remains shut and that the high pressure alarm on the condensate supply does not annunciate during quarterly pump tests should be sufficient to demonstrate valve operability provided that the licensee disassembles and inspects both of the in-series check valves if any leakage past them is detected during any system test.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, relief may be granted from the individual valve exercising requirements of Section XI as requested.

4.3 Residual Heat Removal System

4.3.1 Category C Valves

4.3.1.1 Relief Request. The licensee has requested relief from exercising valves RHR-CV-18, -19, -24, and -25, residual heat removal pressure maintenance supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify closure of at least one valve in each pair of series valves quarterly.

4.3.1.1.1 Licensee's Basis for Requesting Relief--These valves are normally open check valves (with 2 in series). They are required to be open to keep the RHR system in a solid standby condition. When the RHR pumps start, these valves should close to ensure maximum flow to the test loop or reactor.

Surveillance Procedure 6.3.5.1 for RHR pump testing provides adequate testing to verify the open position for these valves. Prior to pump testing, system vent valves are opened and flow is observed. This flow will verify the pressure maintenance valves are open and operating properly. This is required by Technical Specification 4.5.G.1.

When a RHR pump is started, required pump flow rate and discharge pressure would verify one of the two valves in series per loop has closed. Corrective action would be required if pump parameters were not within specification. In addition, should both valves fail to close, a relief valve would lift or a pressure sensor would alarm on the condensate supply side of the valves. The current system design does not allow to ensure both valves have been closed.

Alternative Test:

In lieu of Section XI valve testing, current CNS Surveillance Procedure testing will serve to assess valve operational readiness.

4.3.1.1.2 Evaluation--Due to present system configuration, these valves cannot be exercised closed individually. Also, they are not equipped with sufficient test connections or position indication to verify closure individually. The licensee's proposal to verify closure of at least one of the two valves in series in each pressure maintenance line by verifying that the upstream relief valve remains shut and that the high pressure alarm on the condensate supply does not annunciate during quarterly pump tests should be sufficient to demonstrate valve operability provided that the licensee disassembles and inspects both of the in-series check valves if any leakage past them is detected during any system test.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, relief may be granted from the individual valve exercising requirements of Section XI as requested.

4.3.1.2 Relief Request. The licensee has requested relief from exercising valve RHR-CV-20, service water emergency core flooding supply check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to manually full-stroke exercise this valve during disassembly every third refueling outage.

4.3.1.2.1 Licensee's Basis for Requesting Relief--Routine exercising with service water flow could potentially allow corrosive materials and sand to be introduced into the reactor coolant system via the residual heat removal system. This could lead to chemical transients in the primary coolant allowing excessive corrosion and degradation of reactor internals, associated pumps, piping, and valves. This could be conducive to reactor and or system damage, therefore, RHR-CV-20 cannot be exercised with flow during operations or cold shutdown.

Inspection History:

RHR-CV-20 has been disassembled and manually stroked five times since 1980.

Date	Results
April 1980	Satisfactory
April 1981	Satisfactory
June 1982	Satisfactory
September 1983	Satisfactory
August 1985	Satisfactory

A review of plant equipment history indicates no previous mechanical failure for RHR-CV-20. As such, the inspection frequency will be decreased to every third refueling outage.

Alternative Test:

During every third refueling outage, this valve will be disassembled and manually full-stroke exercised. The history of previous inspection results justify decreasing the test frequency from once per refueling outage to once every third refueling outage.

4.3.1.2.2 Evaluation--This valve cannot be full- or partial-stroke exercised with flow because the only flow path available is into the reactor coolant system or into the suppression pool through portions of the residual heat removal system. Due to system design, any service water flow through this valve could result in the introduction of low quality raw water into the reactor coolant system during residual heat removal system operation and could force the unit to remain in a cold shutdown condition due to the inability to maintain reactor coolant chemistry specifications. Introduction of raw water into the suppression pool could result in loss of reactor coolant chemistry control because all

of the emergency core cooling systems utilize the suppression pool as a source of water or as part of the test flow path for each system and the suppression pool water could then be transported to the reactor coolant system. Low quality water in the reactor coolant system could result in damage to reactor vessel internals through corrosion and decreased heat transfer capability due to fouling of heat transfer surfaces.

The licensee's proposal to disassemble and manually full-stroke exercise this valve during refueling outages appears to be the only practical alternate exercising method available. Disassembly/inspection is an acceptable method to utilize to assess valve condition, however, the licensee's proposal to decrease the inspection frequency from each refueling outage to every third refueling outage is not acceptable because the inspection interval could be as long as four and one-half years. There is no assurance that the valve could perform its safety-related function during that interval because it is in an idle section of piping and is never exercised, even partially, utilizing system flow. Therefore, an accumulation of corrosion could prevent valve movement and would go undetected for a considerable length of time with no corrective action being taken.

Compliance 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 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 alternate testing of verifying valve operability by disassembly, inspection, and manually exercising the valve disks during reactor refueling outages, relief may be granted from the Code requirements as requested provided that the disassembly/inspection is performed each refueling outage.

4.4 Standby Liquid Control System

4.4.1 Category A/C Valves

4.4.1.1 Relief Request. The licensee has requested relief from exercising valves SLC-CV-12 and -13, standby liquid control injection checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to full-stroke exercise these valves during refueling outages.

4.4.1.1.1 Licensee's Basis for Requesting Relief--To test SLC-CV-12 and SLC-CV-13 quarterly would require manually valving-out the sodium pentaborate (poison) suction to the SLC pumps, flushing the system with demineralized water, and injecting cold demineralized water into a hot operating reactor vessel.

Injecting cold water into a hot reactor vessel could cause thermal stresses in the piping, nozzles, or the reactor vessel and could potentially lead to reactor damage, fuel damage, and potential release of radioactive material. Also, Technical Specification 3.4.D requires the reactor to be in cold shutdown within 24-hours after the SLC system is declared inoperative (valving-out pump suction).

To test these valves during cold shutdown would require firing the squib valves or valve disassembly. It would also require flushing the SLC system lines to remove any trace of poison. Introduction of residual poison could lead to degradation of reactivity control and potential reactor damage.

Surveillance Procedure 6.3.8.4 tests both check valves for opening each refueling cycle. Also, both valves are verified as closing during leak-rate testing each cycle and, should either valve fail to function, corrective action would be required.

Alternative Test:

In lieu of Section XI testing quarterly or each cold shutdown, SLC-CV-12 and SLC-CV-13 will be exercised each refueling outage.

4.4.1.1.2 Evaluation--These valves cannot be exercised during power operation because the only method available to exercise them open is to utilize system flow which would result in injecting boron solution into the reactor vessel which, in turn, would result in a reactor shutdown. The standby liquid control system cannot be removed from service for flushing during power operation due to Technical Specification requirements. These valves cannot be exercised during cold shutdown because extensive flushing is required to remove all traces of the boron solution to prevent its entry into the reactor coolant system. Additionally, one of the explosive valves must be removed or fired to provide a flow path.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, the alternate testing of full-stroke exercising these valves during refueling outages when the standby liquid control system can be removed from service and flushed free of the boron solution should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.5 High Pressure Coolant Injection System

4.5.1 Category A/C Valves

4.5.1.1 Relief Request. The licensee has requested relief from full-stroke exercising valves HPCI-LVSC-44, high pressure coolant injection turbine exhaust stop check, and HPCI-LVSC-50, high pressure coolant injection turbine drain stop check, in accordance with the requirements of Section XI, Paragraphs IWV-3400 and -3520, and proposed to stroke them open during pump tests and to verify closure during refueling outages.

4.5.1.1.1 Licensee's Basis for Requesting Relief--Mechanically exercising to the closed position quarterly or during cold shutdown could result in failure or sticking of either valve. This would render the HPCI system inoperable and a Limiting Condition of Operation would be entered requiring either equipment repair within a specified time or plant shutdown.

Alternative Test:

The above valves will be verified as closing each refueling outage during leak-rate testing and verified as opening during monthly HPCI pump testing.

4.5.1.1.2 Evaluation--These valves should be verified to shut during leak testing at refueling outages because they are stop check valves and, since the valve disk is not connected to the valve operator, the disk cannot be moved to the open position using the operator. The disk can, however, be forced shut using the operator with no way of re-opening the disk if it should stick shut and the failure would go undetected until the turbine was operated which, in turn, could result in failure of the entire system to perform its safety function.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate testing of exercising these valves open during pump tests and of verifying closure during the performance of leak rate testing at refueling outages should be sufficient to demonstrate valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.5.2 Category C Valves

4.5.2.1 Relief Request. The licensee has requested relief from exercising valves HPCI-CV-18 and -19, high pressure coolant injection pressure maintenance supply checks, in accordance with the requirements of

Section XI, Paragraph IWV-3520, and proposed to verify closure of at least one valve in each pair of series valves quarterly.

4.5.2.1.1 Licensee's Basis for Requesting Relief--These valves are normally open check valves in series. They are required to be open to keep the HPCI system in a solid standby condition. When the HPCI pump starts, these valves should close to ensure maximum flow to the test loop or reactor.

Surveillance Procedure 6.3.3.1 for HPCI pump testing provides adequate testing to verify the open position for these valves. Prior to pump testing, system vent valves are opened and flow is observed. This flow will verify the pressure maintenance valves are open and operating properly. This is required by Technical Specification 4.5.G.1.

When the pump is started, required pump flow rate and discharge pressure would verify one of the two valves in series has closed. Corrective action would be required if pump parameters were not within specification. In addition, should both valves fail to close, a relief valve would lift or a pressure sensor would alarm on the condensate supply side of the valves. The current system design does not allow to ensure both valves have closed.

Alternative Test:

In lieu of Section XI valve testing, current CNS Surveillance Procedure testing will serve to assess valve operational readiness.

4.5.2.1.2 Evaluation--Due to present system configuration, these valves cannot be exercised closed individually. Also, they are not equipped with sufficient test connections or position indication to verify closure individually. The licensee's proposal to verify closure of at least one of the two valves in series in the pressure maintenance line by verifying that the upstream relief valve remains shut and that the high pressure alarm on the condensate supply does not annunciate during

quarterly pump tests should be sufficient to demonstrate valve operability provided that the licensee disassembles and inspects both of the in-series check valves if any leakage past them is detected during any system test.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, relief may be granted from the individual valve exercising requirements of Section XI as requested.

4.5.2.2 Relief Request. The licensee has requested relief from exercising valve HPCI-CV-11, high pressure coolant injection torus suction check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to manually full-stroke exercise this valve during disassembly every third refueling outage.

4.5.2.2.1 Licensee's Basis for Requesting Relief--Partial or full-stroke exercising this valve would involve a system design which would permit recirculation to and from the torus. This is not possible with the existing system design.

Inspection History:

HPCI-CV-11 has been disassembled and manually stroked seven times since 1978.

Date	Results
April 1978	Satisfactory
May 1979	Satisfactory
April 1980	Satisfactory
April 1981	Satisfactory
June 1982	Satisfactory
September 1983	Satisfactory
August 1985	Satisfactory

A review of plant equipment history indicates no previous mechanical failure for HPCI-CV-11. As such, the inspection frequency will be decreased to every third refueling outage.

Alternative Test:

This valve will be disassembled and manually full-stroke exercised during every third refueling outage. The history of previous inspection results justify the test frequency of once every third refueling outage.

4.5.2.2.2 Evaluation--Due to plant design, high pressure coolant injection system flow cannot be utilized to full-stroke exercise this valve during power operation or cold shutdown. The system suction must be aligned to the suppression pool to full-stroke exercise this valve and would result in the introduction of relatively low quality water into the reactor vessel which, in turn, may force plant shutdown due to the inability to maintain reactor coolant chemistry specifications. Also, steam is not available to drive the high pressure coolant injection turbine during cold shutdowns or refueling outages, therefore, system flow cannot be utilized to exercise this valve during those plant conditions.

The licensee's proposal to disassemble and manually full-stroke exercise this valve during refueling outages appears to be the only practical alternate exercising method available. Disassembly/inspection is an acceptable method to utilize to assess valve condition, however, the licensee's proposal to decrease the inspection frequency from each refueling outage to every third refueling outage is not acceptable because the inspection interval could be as long as four and one-half years. There is no assurance that the valve could perform its safety-related function during that interval because it is in an idle section of piping and is never exercised, even partially, utilizing system flow. Therefore, an accumulation of corrosion could prevent valve movement and would go undetected for a considerable length of time with no corrective action being taken.

Compliance with the Code required testing method is impractical due to system design. Compliance with the Code required testing frequency would be burdnesome since this would require quarterly 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 alternate testing of verifying valve operability by disassembly, inspection, and manually exercising the valve disks during reactor refueling outages, relief may be granted from the Code requirements as requested provided that the disassembly/inspection is performed each refueling outage.

4.5.2.3 Relief Request. The licensee has requested relief from exercising valves HPCI-CV-24, -25, -26, and -27, high pressure coolant injection turbine exhaust line vacuum breaker checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to manually full-stroke exercise these valves during refueling outages.

4.5.2.3.1 Licensee's Basis for Requesting Relief--The HPCI turbine exhaust vacuum breaker checks are located in the torus area. These valves are inaccessible or access is extremely hazardous for mechanical exercising during operations and cold shutdowns. The torus is contaminated and filled with water.

Exercising each refueling cycle would serve to adequately assess valve operational readiness and not unduly expose personnel to excess radiation exposure and safety hazards.

Alternative Test:

Mechanical exercising will be performed each refueling outage.

4.5.2.3.2 Evaluation--These valves cannot be manually exercised during power opration or cold shutdowns because they are located in the torus (suppression pool area) which is inside the reactor containment. The containment is always inerted with nitrogen gas during power operation and

is not routinely de-inerted during cold shutdowns. Additionally, access to these valves is very limited because the torus can be entered only through a manway equipped with a large bolted cover. The cover is sealed and forms part of the primary containment boundary, therefore, the manway must be local leak rate tested as required by 10 CFR 50, Appendix J, following each torus entry.

Based on the impracticality of exercising these valves quarterly or during cold shutdowns, the burden on the licensee if these Code requirements were imposed, and the licensee's proposed alternate testing of full-stroke exercising these valves during reactor refueling outages, relief may be granted from the Section XI requirements as requested.

4.6 Reactor Core Isolation Cooling System

4.6.1 Category A/C Valves

4.6.1.1 Relief Request. The licensee has requested relief from full-stroke exercising valves RCIC-LVSC-37, reactor core isolation cooling turbine exhaust stop check, and RCIC-LVSC-42, reactor core isolation cooling barometric condenser vacuum pump torus discharge stop check, in accordance with the requirements of Section XI, Paragraphs IWV-3400 and -3520, and proposed to stroke them open during pump tests and to verify closure during refueling outages.

4.6.1.1.1 Licensee's Basis for Requesting Relief--Mechanically exercising to the closed position quarterly or during cold shutdown could result in failure or sticking of either valve. This would render the RCIC system inoperable.

Alternative Test:

The above valves will be verified as closing each refueling outage during leak-rate testing and verified as opening during monthly RCIC pump testing.

4.6.1.1.2 Evaluation--These valves should be verified to shut during leak testing at refueling outages because they are stop check valves and, since the valve disk is not connected to the valve operator, the disk cannot be moved to the open position using the operator. The disk can, however, be forced shut using the operator with no way of re-opening the disk if it should stick shut and the failure would go undetected until the turbine was operated which, in turn, could result in failure of the entire system to perform its safety function.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate testing of exercising these valves open during pump tests and of verifying closure during the performance of leak rate testing at refueling outages should be sufficient to demonstrate valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.6.2 Category C Valves

4.6.2.1 Relief Request. The licensee has requested relief from exercising valves RCIC-CV-18 and -19, reactor core isolation cooling pressure maintenance supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify closure of at least one valve in each pair of series valves quarterly.

4.6.2.1.1 Licensee's Basis for Requesting Relief--These valves are normally open check valves in series. They are required to be open to keep the RCIC system in a solid standby condition. When the RCIC pump starts, these valves should close to ensure maximum flow to the test loop or reactor.

Surveillance Procedure 6.3.6.1 for RCIC pump testing provides adequate testing to verify the open position for these valves. Prior to pump testing, system vent valves are opened and flow is observed. This flow will verify the pressure maintenance valves are open and operating properly and is required by Technical Specification 4.5.G.1.

When the pump is started, required pump flow rate and discharge pressure would verify one of the two valves in series per loop has closed. Corrective action would be required if pump parameters were not within specification. In addition, should both valves fail to close, a relief valve would lift or a pressure sensor would alarm on the condensate supply side of the valves. The current system design does not allow to ensure both valves have closed.

Alternative Test:

In lieu of Section XI valve testing, current CNS Surveillance Procedure testing will serve to assess valve operational readiness.

4.6.2.1.2 Evaluation--Due to present system configuration, these valves cannot be exercised closed individually. Also, they are not equipped with sufficient test connections or position indication to verify closure individually. The licensee's proposal to verify closure of at least one of the two valves in series in the pressure maintenance line by verifying that the upstream relief valve remains shut and that the high pressure alarm on the condensate supply does not annunciate during quarterly pump tests should be sufficient to demonstrate valve operability provided that the licensee disassembles and inspects both of the in-series check valves if any leakage past them is detected during any system test.

Based on the impracticality of complying with the Code requirements and the burden on the licensee if those requirements were imposed, relief may be granted from the individual valve exercising requirements of Section XI as requested.

4.6.2.2 Relief Request. The licensee has requested relief from exercising valve RCIC-CV-11, reactor core isolation cooling torus suction check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to manually full-stroke exercise this valve during disassembly every third refueling outage.

4.6.2.2.1 Licensee's Basis for Requesting Relief--Partial or full-stroke exercising this valve would involve a system design which would permit recirculation to and from the torus. This is not possible with the existing system design.

Inspection History:

RCIC-CV-11 has been disassembled and manually stroked seven times since 1978.

Date	Results
March 1978	Satisfactory
May 1979	Satisfactory
April 1980	Satisfactory
April 1981	Satisfactory
June 1982	Satisfactory
September 1983	Satisfactory
August 1985	Satisfactory

A review of plant equipment history indicates no previous mechanical failure for RCIC-CV-11. As such, the inspection frequency will be decreased to every third refueling outage.

Alternative Test:

This valve will be disassembled and manually full-stroke exercised during every third refueling outage. The history of previous inspection results justify the test frequency of once every third refueling outage.

4.6.2.2.2 Evaluation--Due to plant design, reactor core isolation cooling system flow cannot be utilized to full-stroke exercise this valve during power operation or cold shutdown. The system suction

must be aligned to the suppression pool to full-stroke exercise this valve and would result in the introduction of relatively low quality water into the reactor vessel which, in turn, may force plant shutdown due to the inability to maintain reactor coolant chemistry specifications. Also, steam is not available to drive the reactor core isolation cooling turbine during cold shutdowns or refueling outages therefore, system flow cannot be utilized to exercise this valve during those plant conditions.

The licensee's proposal to disassemble and manually full-stroke exercise this valve during refueling outages appears to be the only practical alternate exercising method available. Disassembly/inspection is an acceptable method to utilize to assess valve condition, however, the licensee's proposal to decrease the inspection frequency from each refueling outage to every third refueling outage is not acceptable because the inspection interval could be as long as four and one-half years. There is no assurance that the valve could perform its safety-related function during that interval because it is in an idle section of piping and is never exercised, even partially, utilizing system flow. Therefore, an accumulation of corrosion could prevent valve movement and would go undetected for a considerable length of time with no corrective action being taken.

Compliance 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 valve disassembly. Based on the impracticality of complying with the Code required testing frequency and the licensee's proposed alternate testing of verifying valve operability by disassembly, inspection, and manually exercising the valve disks during reactor refueling outages, relief may be granted from the Code requirements as requested provided that the disassembly/inspection is performed each refueling outages.

4.6.2.3 Relief Request. The licensee has requested relief from exercising valves RCIC-CV-22, -23, -24, and -25, reactor core isolation cooling turbine exhaust line vacuum breaker checks, in accordance with the

requirements of Section XI, Paragraph IWV-3520, and proposed to full-stroke exercise these valves during refueling outages.

4.6.2.3.1 Licensee's Basis for Requesting Relief--The RCIC turbine exhaust vacuum breaker checks are located in the torus area. These valves are inaccessible or access is extremely hazardous for mechanical exercising during operations and cold shutdowns. The torus is contaminated and filled with water.

Exercising each refueling cycle would serve to adequately assess valve operational readiness and not unduly expose personnel to excess radiation exposure and safety hazards.

Alternative Test:

Mechanical exercising will be performed each refueling outage.

4.6.2.3.2 Evaluation--These valves cannot be manually exercised during power operation or cold shutdowns because they are located in the torus (suppression pool area) which is inside the reactor containment. The containment is always inerted with nitrogen gas during power operation and is not routinely de-inerted during cold shutdowns. Additionally, access to these valves is very limited because the torus can be entered only through a manway equipped with a large bolted cover. The cover is sealed and forms part of the primary containment boundary, therefore, the manway must be local leak rate tested as required by 10 CFR 50, Appendix J, following each torus entry.

Based on the impracticality of exercising these valves quarterly or during cold shutdowns, the burden on the licensee if these Code requirements were imposed, and the licensee's proposed alternate testing of full-stroke exercising these valves during reactor refueling outages, relief may be granted from the Section XI requirements as requested.

4.7 Reactor Feedwater System

4.7.1 Category A/C Valves

4.7.1.1 Relief Request. The licensee has requested relief from exercising valves RF-CV-13, -14, -15, and -16, reactor feedwater header checks, in accordance with the requirements of Section XI, Paragraphs IWV-3400 and -3520, and proposed to verify closure during each refueling outage.

4.7.1.1.1 Licensee's Basis for Requesting Relief--These valves are normally open and must remain open during reactor operations to ensure adequate feedwater flow. Feedwater provides normal reactor core cooling during operation. To exercise these valves during plant operation could cause a reactor scram due to the transitory nature of operating the feedwater pumps at low-flow or no-flow conditions.

Alternative Test:

These valves will be exercised to a closed position during refueling outages. The observation of specified leakage during local leak-rate testing provides the only means for verification to the closed position.

4.7.1.1.2 Evaluation--These valves cannot be exercised shut during power operation because interruption of reactor feedwater could cause a reactor trip. Valves RF-CV-14 and -16 are dual function valves, i.e., open to allow high pressure coolant injection and reactor core isolation cooling flow to the reactor vessel and closed to provide containment isolation. The function of valves RF-CV-13 and -15 is to shut to prevent diversion of high pressure coolant injection and reactor core isolation cooling flow from the reactor vessel. The open position of valves RF-CV-14 and -16 is continuously verified during reactor operation utilizing reactor feedwater flow, however, the only method available to verify closure of all four valves is leak testing because these valves are not equipped with position indication and some of the required test

connections are located inside containment. The containment is always inerted with nitrogen gas during power operation and is not routinely de-inerted during cold shutdowns.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the alternate testing of verifying the open position of RF-CV-14 and -16 during normal operation and of verifying closure of all four valves during leak tests performed at refueling outages should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.8 Main Steam System

4.8.1 Category A Valves

4.8.1.1 Relief Request. The licensee has requested relief from trending the stroke time of valves MS-AO-80A, -80B, -80C, and -80D, inboard main steam isolations, and MS-AO-86A, -86B, -86C, and -86D, outboard main steam isolations, in accordance with Section XI, Paragraph IWV-3417(a), and proposed to utilize the Technical Specification stroke time limits.

4.8.1.1.2 Licensee's Basis for Requesting Relief--Each MSIV is full-stroke timed each quarter. Stroke-time specifications in seconds (T) are given below:

With Flow $3 < T < 5$

Without Flow $4 < T < 4.5$

The normal operating time is 4 seconds. A 50% deviation from the normal operating time would be 2 seconds or 6 seconds. This would exceed Technical Specification limits and corrective action would be required. Since corrective action is required before the 50% deviation is reached, an increase in test frequency would not serve any purpose.

Alternative Test:

Due to the short stroke-time specifications for the MSIVs, no increase in test frequency will be performed if stroke-time exceeds 50% of the previous test value.

4.8.1.1.3 Evaluation--Trending the stroke times of the main steam isolation valves is unnecessary because the plant Technical Specifications place definite limits on the maximum and minimum allowable stroke times which are more restrictive than the requirements of Section XI. In addition, the plant Technical Specifications require corrective action if either limit is exceeded.

Since the plant Technical Specifications are more restrictive than the requirements of Section XI, the alternate stroke timing proposed will give reasonable assurance of valve operability and, therefore, relief may be granted from the valve stroke time trending requirements of Section XI as requested.

4.8.2 Category B/C Valves

4.8.2.1 Relief Request. The licensee has requested relief from exercising and measuring the stroke times of valves MS-RV-71A, -71B, -71C, -71D, -71E, -71F, -71G, and -71H, main steam safety/reliefs, in accordance with the requirements of Section XI, Paragraph IWV-3400, and proposed to full-stroke exercise these valves without measuring stroke time once during each refueling cycle.

4.8.2.1.1 Licensee's Basis for Requesting Relief--These valves are power actuated and serve as safety relief valves for the main steam lines. Each valve is currently exercised in accordance with Surveillance Procedure 6.3.2.1. Exercising these valves during reactor operations can cause pressure, temperature, and reactivity transients to the primary pressure boundary and containment system.

The valve supplier does not recommend exercising these valves below 150 psig steam pressure because of the risk of valve seat damage and resultant leakage. Technical Specifications require testing once each refueling cycle at a reactor pressure >100 psig which is adequate to assess the operational readiness of these valves.

Relief valves are quick acting and their stroke-time cannot be measured by conventional means. Successful exercising will verify adequate stroke-time. Should a relief valve fail to function as designed, corrective action is required.

Alternative Test:

Exercise once each refueling cycle in accordance with Surveillance Procedure 6.3.2.1.

4.8.2.1.2 Evaluation--Operation of these valves during power operation should be minimized because each operation results in reactor pressure and power transients that could result in a reactor trip. Also, failure of one of these valves in the open position would result in rapid depressurization and cooldown of the reactor vessel and a reactor trip. However, these valves must be exercised while the reactor is at power because reactor steam is the motive force and, therefore, they cannot be operated during cold shutdowns or refueling outages since reactor steam is not available during those plant conditions. Additionally, these valves cannot be stroke timed without the installation of special test and timing equipment because they are extremely fast acting, are located inside primary containment, and are inaccessible during power operation.

Based on the impracticality of full-stroke exercising and stroke timing these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, full-stroke exercising these valves, without stroke timing, at a refueling outage frequency (i.e., entering or leaving a refueling outage) when some reactor steam is available, should be sufficient to demonstrate proper valve

operability and, therefore, relief may be granted from these requirements of Section XI as requested.

4.8.3 Category C Valves

4.8.3.1 Relief Request. The licensee has requested relief from exercising valves MS-CV-21 through -35, main steam safety/relief valve tailpipe vacuum breaker checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to full-stroke exercise them during refueling outages.

4.8.3.1.1 Licensee's Basis for Requesting Relief--These vacuum breaker checks are located inside containment. They are inaccessible or access is extremely hazardous for mechanical exercising during operations.

Exercising once each refueling cycle during cold shutdown would serve to adequately assess valve operational readiness and not unduly expose personnel to excess radiation exposure and safety hazards.

Alternative Test:

Mechanical exercising will be performed each refueling outage.

4.8.3.1.2 Evaluation--These valves are located inside containment and drywell access is required to manually exercise them. These valves are not equipped with actuators or position indication and are accessible only during shutdowns and only when the drywell is de-inerted. They cannot be exercised during each cold shutdown because the drywell is not routinely de-inerted each cold shutdown.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, full-stroking these valves during refueling outages when the drywell is de-inerted to allow access should demonstrate

roper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.9 Reactor Water Cleanup System

4.9.1 Category A/C Valves

4.9.1.1 Relief Request. The licensee has requested relief from exercising valve RWCU-CV-15, reactor water cleanup return header check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify valve closure (its safety position) during leak testing at refueling outages.

4.9.1.1.1 Licensee's Basis for Requesting Relief--This valve cannot be ve ified as being closed upon reversal or stopping of flow without opening and venting the line on the upstream side of the check valve. Opening or venting the RWCU line during operations could cause a leak of high pressure reactor coolant and potentially lead to the release of radioactive material.

An extended RWCU system outage during normal operations or cold shutdown would lead to a degradation of reactor water purity. This would add to the radioactive contamination in the reactor coolant system and could lead to additional exposure of site personnel. It is essential that RWCU remain in operation as much as possible and RWCU-VC-15 closure verification be performed only during refueling outages.

Alternative Test:

4"-RWCU-CV-15 will be verified for closing during leak-rate testing once each refueling cycle.

4.9.1.1.2 Evaluation--This system cannot be removed from service for any length of time during power operation or cold shutdown because that could result in the inability to maintain reactor coolant chemistry within

specifications which, in turn, would force reactor shutdown or prevent reactor startup. This valve is not equipped with an actuator or position indication, so the only alternative method available to verify closure is leak testing.

Based on the impracticality of full-stroke exercising this valve quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate testing of verifying valve closure during the performance of leak testing at refueling outages should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.10 Primary Containment System

4.10.1 Category A/C Valves

4.10.1.1 Relief Request. The licensee has requested relief from exercising valves PC-CV-13 and -14, primary containment vacuum breaker checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to full-stroke exercise these valves during refueling outages.

4.10.1.1.1 Licensee's Basis for Requesting Relief--Access to these valves is extremely difficult and hazardous. Despite the personnel hazard, they have been tested quarterly for over 10 years and have never experienced a failure. The valves do not experience excessive use or stress which could lead to valve degradation. For these reasons, the testing frequency will be changed to once each refueling cycle.

Alternative Test:

Exercise once each refueling cycle instead of quarterly or cold shutdown.

4.10.1.1.2 Evaluation--These valves are in a location dangerous to personnel because they are located in the area above the rounded top of the torus where there are no permanently installed walkways or handrails and falls are a hazard. Also, these valves should not degrade due to their service conditions because they are exposed to building atmosphere only, externally, and either air or nitrogen gas internally; neither of which is a hostile environment that would contribute to valve degradation.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate exercising frequency of each refueling outage when ample time is available to rig scaffolding and other safety equipment should be sufficient to demonstrate valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.11 Control Rod Drive System

4.11.1 Category A/C Valves

4.11.1.1 Relief Request. The licensee has requested relief from exercising valves CRD-CV-13, -14, -15, and -16, reactor recirculation pump seal water supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify valve closure (their safety position) during leak testing each refueling outage.

4.11.1.1.1 Licensee's Basis for Requesting Relief--These valves cannot be exercised during operation. Stopping or reversal of flow impose a severe thermal transient on the reactor recirculation pump seals, which could possibly lead to seal failure.

Alternative Test:

Each valve will be verified as operating properly (closing) during the leak-rate test performed each refueling cycle.

4.11.1.1.2 Evaluation--These valves cannot be exercised closed during power operation because the loss of seal water flow could result in reactor recirculation pump seal failure or greatly reduced seal life. These valves cannot be exercised during cold shutdowns because one of the reactor recirculation pumps is usually kept running and must be supplied with seal water. Additionally, these valves are not equipped with position indication and some of the required test connections are located inside containment and may be inaccessible because the drywell is not routinely de-inerted each cold shutdown.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the alternate testing proposed should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.11.2 Category B Valves

4.11.2.1 Relief Request. The licensee has requested relief from exercising valves CRD-CV-126 and -127, control rod scram inlet and outlet, in accordance with the requirements of Section XI, Paragraph IWV-3400, and proposed to full-stroke exercise 10% of them every 16 weeks and all of them after each refueling outage.

4.11.2.1.1 Licensee's Basis for Requesting Relief--These valves (137 each) are required to operate for rapid insertion (scram) of control rods. Each valve is tested by scram timing control rods in accordance with Technical Specification Sections 3.3 and 4.3, and Nuclear Performance Evaluation Procedure 10.9. The Technical Specifications require testing 10% of the CRDs every 16 weeks and 100% of the drives after each refueling outage. The CRDs must fully insert within specified time limits. Should either the insert or exhaust valves fail, the CRDs may not be able to meet Technical Specification requirements.

The air operated valves fail open on loss of air or power. Normal opening removes power to the pilot solenoid valve simulating a loss of power. On loss of power, the solenoid vents the air operator and CRD-CV-126 and CRD-CV-127 are spring driven open. Thus each time a scram signal is given, the valves "experience" a loss of air/power to verify each valves' fail-safe open feature. In effect, scram testing meets or exceeds the functional testing requirements of Section XI to assess operational readiness.

Alternate Test:

Scram testing per Technical Specifications will be substituted for all Section XI requirements. The test frequency will be 10% each 16 weeks and 100% after each refueling outage.

4.11.2.1.2 Evaluation--These valves cannot be exercised without causing the associated control rod to scram and the valves must operate properly in order that the associated control rod meets the scram insertion time limits defined in the Technical Specifications. The alternate exercising frequency required by the Technical Specifications has been previously reviewed and approved by the NRC staff to reduce the wear of the control rod drive mechanisms and to reduce the number of rapid reactivity transients to which the reactor core is exposed. However, since these valves are power operated, they must be stroke timed when exercised or relief from stroke timing should be requested. The licensee has failed to provide a discussion of any difficulties encountered while attempting to stroke time these valves or even if an attempt has been made. These are very rapidly acting valves that operate in pairs and cannot be stroke timed without the installation of special timing and recording equipment.

Based on the impracticality of complying with the exercising requirements of Section XI and the burden on the licensee if those requirements were imposed, relief may be granted from the exercising frequency requirements of Section XI to allow exercising these valves in accordance with the exercising frequency required by the Technical

Specifications. However, the licensee has not demonstrated the impracticality of measuring the stroke time of these valves, therefore, they should be required to measure the stroke time of these valves when exercised or explain why stroke timing cannot be accomplished in the form of a relief request that must subsequently be reviewed and approved by the NRC staff before implementation.

4.11.3 Category C Valves

4.11.3.1 Relief Request. The licensee has requested relief from exercising valve CRD-CV-114, control rod scram discharge header check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to full-stroke it during control rod scram testing.

4.11.3.1.1 Licensee's Basis for Requesting Relief--This valve (137 each) is required to operate for rapid insertion (scram) of control rods. Each valve is tested by scram timing control rods in accordance with Technical Specification Sections 3.3 and 4.3, and Nuclear Performance Evaluation Procedure 10.9. The Technical Specifications require testing 10% of the CRDs every 16 weeks and 100% of the drives after each refueling outage. The CRDs must fully insert within specified time limits. Should this valve fail, its CRD may not be able to meet Technical Specification requirements.

Alternative Test:

Scram testing per Technical Specification will be substituted for all Section XI requirements. The test frequency will be 10% each 16 weeks and 100% after each refueling outage.

4.11.3.1.2 Evaluation--The 114 valve, which is located in the scram discharge line, must open to allow the control rod to scram and proper operation is verified during control rod scram testing if the associated control rod meets the scram insertion time limits defined in the

Technical Specifications. Also, the proposed alternate exercising frequency is acceptable as previously stated in Item 4.11.2.1.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate testing of verifying proper control rod scram insertion times should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.11.3.2 Relief Request. The licensee has requested relief from exercising valve CRD-CV-115, accumulator charging header check, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify closure during refueling outages.

4.11.3.2.1 Licensee's Basis for Requesting Relief--This valve (137 each) is required to operate for rapid insertion (scram) of control rods. It is partially tested by scram timing control rods in accordance with Technical Specification Section 3.3 and 4.3, and Nuclear Performance Evaluation Procedure 10.9. Technical Specifications require testing 10% of the CRDs every 16 weeks and 100% of the drives after each refueling outage. The CRDs must fully insert within specified time limits. Should the check valve fail to close, the CRDs may not be able to meet Technical Specification requirements.

This valve is tested in the reverse flow direction (closed position) by Surveillance Procedure 6.4.1.8. This test isolates each CRD scram accumulator and vents pressure on the upstream side of the check valve. Accumulator pressure decay would be observed should the valve fail to close properly. Corrective action is required if any CRD accumulator inlet check valve should fail to hold pressure in accordance with specifications.

Alternative Test:

Testing per Surveillance Procedure 6.4.1.8 will be substituted for Section XI requirements. The test frequency will be each refueling cycle.

4.11.3.2.2 Evaluation--The 115 valve, located in the accumulator charging water header, must close when the associated control rod is scrammed to prevent diversion of flow away from the scram flow path in the event the accumulator charging header became depressurized. However, since this valve is not equipped with position indication, the only method available to verify closure is the licensee's proposed accumulator pressure decay test performed in accordance with Technical Specifications.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, the proposed alternate testing of verifying valve closure during the performance of a pressure decay test in addition to observing satisfactory control rod scram times should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.12 Service Water System - Diesel Generator

4.12.1 Category C Valves

4.12.1.1 Relief Request. The licensee has requested relief from exercising valves SW-CV-35CV, -36CV, -37CV, and -38CV, diesel generator service water supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3520, and proposed to verify valve operability during diesel engine tests and to disassemble and inspect each valve every third refueling outage.

4.12.1.1.1 Licensee's Basis for Requesting Relief--These check valves are in the lines to supply cooling water to the emergency diesels.

Diesel temperatures are monitored during monthly testing. Should these valves fail to open or provide adequate flow for DG cooling, the problem would be observed during this monthly test. Should DG operational temperature exceed specification, corrective action would be required per Surveillance Procedure 6.3.12.1.

Currently, Surveillance Procedure 6.3.10.16 is used to visually inspect the DG-SW check valves once every three years. This procedure meets the suggested requirements in IE-Bulletin 83-03.

Alternative Test:

In lieu of Section XI testing, each valve will be disassembled and visually inspected every three years and operability assessed every month during DG operability testing. This combination of testing meets or exceeds Section XI testing requirements.

4.12.1.1.2 Evaluation--Verification of proper diesel generator operating temperatures during the diesel generator load tests in addition to the proposed disassembly/inspection every third refueling outage should demonstrate that these valves have opened and are allowing sufficient cooling water flow to the engine and to verify the mechanical integrity of the valve internals. This testing is in agreement with the recommendations of IE Bulletin 83-03 which states, in part, "This may be accomplished by using both a forward flow and a back flow test or by valve disassembly and inspection. Other equally effective means of assuring integrity of the valves may be used."

Based on the impracticality of complying with the exercising requirements of Section XI and the burden on the licensee if these requirements were imposed, the proposed alternate testing of verifying proper diesel engine cooling during tests and a disassembly/inspection every third refueling outage should be sufficient to demonstrate valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.13 Service Water System

4.13.1 Category B Valves

4.13.1.1 Relief Request. The licensee has requested relief from testing valves SW-MO-37, reactor building and diesel generator supply header cross connection, SW-MO-117, turbine building service water supply, SW-MO-886, -887, -888, and -889, reactor equipment cooling system/service water cross connections, and SW-MO-650 and -651, reactor equipment cooling heat exchanger service water outlets, in accordance with the requirements of Section XI, Paragraph IWV-3400, and proposed to functionally test these valves in accordance with station surveillance procedures.

4.13.1.1.1 Licensee's Basis for Requesting Relief--Cooper Nuclear Station Technical Specification 4.12.C requires a monthly functional test of system motor-operated valves to demonstrate operability of the component and system. If this test is not completed satisfactorily, the subsystem is declared inoperable and a Limiting Condition of Operation is entered, requiring either equipment repair within a specified time or plant shutdown.

These valves are tested in accordance with Surveillance Procedure 6.3.18.1. Assessing operational readiness has been performed by CNS for over 10 years.

The SW system is continuously in service and each of the above valves is in the position required to support reactor shutdown. The valves are in their normal position related to safety and are essentially passive. They are easily accessible and, should they fail to operate, repair could be immediate.

Alternative Test:

In lieu of testing these valves in accordance with Section XI, these valves will be tested in accordance with Surveillance

Procedure 6.3.18.2. This testing meets or exceeds the requirements of Section XI.

4.13.1.1.2 Evaluation--The licensee has not supplied sufficient technical information that demonstrates that the proposed alternate testing is at least equivalent to the testing required by Section XI. The licensee has not identified these valves in the IST program, Appendix B, "Normal Operating Time," therefore, the assumption must be made that the stroke time of these valves is not being measured while being functionally tested because a limiting stroke time value has not been assigned. On this basis, the licensee's proposed alternate testing does not meet the requirements of Section XI. Also, valves SW-MO-37 and SW-MO-117 do not appear to be passive valves because, according to the system drawings provided with the program, the -37 valve responds to a level switch signal and the -117 valve responds to a pressure switch signal. Additionally, these valves are identified as "Active" in the "IST Valve Summary Listing - Valves," Page 9 of 12, as are all other valves in this relief request.

The licensee has not demonstrated the impracticality of testing these valves in accordance with the requirements of Section XI, therefore, the licensee should be required to comply with Paragraphs IWV-3413(a), (b), and -3417(a) of the Code and relief should not be granted as requested. The licensee should also be required to correctly identify these valves as active or passive throughout the IST program.

4.13.1.2 Relief Request. The licensee has requested relief from stroke timing valves SW-MO-89A and -89B, residual heat removal heat exchanger service water outlets, in accordance with the requirements of Section XI, Paragraph IWV-3413(b), and proposed to test these valves in accordance with station surveillance procedures.

4.13.1.2.1 Licensee's Basis for Requesting Relief--These valves are tested in accordance with Surveillance Procedure 6.3.20.1 and Technical Specification 4.5.B. This testing is performed quarterly. SW-MOV-89A and -89B are throttling flow control type valves. For that reason,

measurement of the time the valve requires to travel to the position required to fulfill its function is impractical. This valve position varies and is highly dependent upon valve trim condition, service water booster pump (SWBP) condition, and flow instrumentation repeatability. Furthermore, these valves are interlocked with each SWBP on their respective loops to prevent starting the SWBP before the valve is a specified percentage of full open. Control of the valve is then transferred to the pump maximum flow controller. This method of valve operation is not conductive to repeatable stroke-time testing.

Alternative Test:

These valves will be full-stroke exercised every three months in accordance with CNS Surveillance Procedure 6.3.20.1. This will meet or exceed the intent of Section XI testing requirements.

4.13.1.2.2 Evaluation--These valves cannot be accurately stroke timed because they are controlled with a "thumb-wheel" type controller after a pump associated with either valve has been started and initiation of valve movement is subject to considerable variation. This type of controller provides an output signal that is dependent upon the speed with which the controller is operated. The stroke time measurements of these valves would be very difficult to repeat due to the absence of valve control switches and would not contribute meaningful data to utilize in monitoring valve degradation.

Based on the impracticality of complying with the valve stroke time measurement requirements of Section XI and the burden on the licensee if these requirements were imposed, the alternate testing of exercising these valves to their required position should be sufficient to demonstrate proper valve operability and, therefore, relief may be granted from the stroke time measurement requirements of Section XI as required.

4.14 Reactor Building Closed Cooling System (REC)

4.14.1 Category B Valves

4.14.1.1 Relief Request. The licensee has requested relief from testing the following valves in accordance with Section XI, Paragraph IWV-3400, and proposed to functionally test them in accordance with station surveillance procedures.

REC-MO-694 and -695:	Loop A and B cross connections
REC-MO-697 and -698:	Critical service return header isolations
REC-MO-700:	Noncritical service supply isolation
REC-MO-702 and -709:	Containment cooling supply and return isolations
REC-MO-712 and -713:	Reactor equipment cooling heat exchanger inlets
REC-MO-711 and -714:	Reactor equipment cooling heat exchanger outlets
REC-MO-721 and -722:	Reactor equipment cooling pump suction noncritical return
REC-MO-1329:	Radwaste supply isolation

4.14.1.1.1 Licensee's Basis For Requesting Relief--The REC system is in operation continuously. The above valves are in the normal position required for the system to perform its safety related function. As required by Technical Specifications, each valve is exercised monthly using Surveillance Procedure 6.3.16.2 and returned to its normal position

after testing. Should a valve fail to demonstrate operability, corrective actions are required by the Technical Specifications.

Surveillance Procedure 6.3.16.2 will serve to assess the operational readiness of the REC motor operated valves.

Alternative Test:

In lieu of Section XI testing, these REC valves will be tested in accordance with Surveillance Procedure 6.3.16.2. These monthly operational tests will meet or exceed the requirements of Section XI.

4.14.1.1.2 Evaluation--The licensee has not supplied sufficient technical information that demonstrates that the proposed alternate testing is at least equivalent to the testing required by Section XI. The licensee has not identified these valves in the IST program, Appendix B, "Normal Operating Time," therefore, the assumption must be made that the stroke time of these valves is not being measured while being functionally tested because a limiting stroke time value has not been assigned. On this basis, the licensee's proposed alternate testing does not meet the requirements of Section XI.

Since the licensee has not demonstrated the impracticality of testing these valves in accordance with the requirements of Section XI and the licensee's proposed alternate testing does not meet the requirements of Section XI, Paragraphs IWV-3413(a), (b), and -3417(a); therefore, relief may not be granted from the requirements of these Paragraphs as requested.

4.14.2 Category C Valves

4.14.2.1 Relief Request. The licensee has requested relief from exercising valves REC-CV-10, -11, -12, and -13, reactor equipment cooling pump discharge checks, REC-CV-15, containment cooling supply check, and REC-CV-16, noncritical cooling return header check, in accordance with the requirements of Section XI, Paragraph IWV-3522, and proposed to

functionally test these valves in accordance with station surveillance procedures.

4.14.2.1.1 Licensee's Basis for Requesting Relief--Usually three of the four REC pumps are in service all the time. Pumps are shifted daily to ensure an equal distribution of use. Surveillance Procedure 6.3.16.1 requires the testing of each of the REC pumps monthly. This testing observes proper flow and no reversal of flow when a pump is stopped. Should any of these valves fail, inadequate flow rates would be observed and corrective action would be required.

Cooper Nuclear Station Technical Specification 4.12.1.B requires periodic testing of the REC system to verify operability of the REC loops. If this operability is not verified, a Limiting Condition of Operation is entered requiring either equipment repair within a specified time or plant shutdown.

Alternative Test:

In lieu of Section XI testing, each valve's operational readiness will be assessed during daily operations (pump shifting) and during monthly testing per Surveillance Procedure 6.3.16.1 The above evaluation will meet or exceed Section XI exercise testing requirements.

4.14.2.1.2 Evaluation--This request for relief is unnecessary for valves REC-CV-10, -11, -12, and -13 because Section XI, Paragraph IWV-3522, allows the use of system flow to full-stroke exercise check valves. Verification of adequate system flow when the pumps are shifted is a satisfactory demonstration of discharge check valve operability, therefore, the licensee is meeting the full-stroke requirements of Section XI.

The check valve REC-CV-15, containment cooling supply, does not appear to perform a safety-related function but has been included in the IST program at the licensee's option. This valve is being full-stroke

exercised utilizing system flow as would be required if it were safety-related, therefore, this relief request is unnecessary. The licensee is presently exercising valve REC-CV-16, noncritical cooling return header check, to the open position only. This exercising position is incorrect because the safety-related position of this valve is shut to prevent loss of pump suction and diversion of flow from the critical cooling headers in the event the noncritical header becomes depressurized. The licensee should be required to exercise this valve to its safety-related position.

The relief request for valves REC-10, -11, -12, -13, and -15 is unnecessary because the licensee is meeting the full-stroke exercising requirements of Section XI. Additionally, since the relief request for valve REC-CV-16 is incorrect, the licensee should be required to verify the closure capability of this valve because its safety-related position is shut.

4.15 Instrument Air System

4.15.1 Category C Valves

4.15.1.1 Relief Request. The licensee has requested relief from exercising valves IA-CV-17 through -22, -36, and -37, main steam safety/relief valve accumulator instrument air supply checks, in accordance with the requirements of Section XI, Paragraph IWV-3522, and proposed to full-stroke exercise them during refueling outages.

4.15.1.1.1 Licensee's Basis for Requesting Relief--These valves are inside containment and inaccessible or extremely difficult to access during normal operations or cold shutdown. An extended time/pressure decay procedure will be used to verify each valve closure. This will be done by venting the upstream side of the check valve and monitoring accumulator pressure to ensure each check valve functions properly.

Performance of this test during each cold shutdown would not significantly improve assessment of valve operability since the relief valves operated by these accumulators are only exercised each refueling cycle. Assessment of valve operability during each cold shutdown would significantly increase personnel exposure and not improve plant safety.

Alternative Test:

The above valves will be tested to verify closure during each refueling outage in accordance with Surveillance Procedure 6.3.9.1.

4.15.1.1.2 Evaluation--These check valves are located inside the drywell and are not accessible during power operation.

Additionally, these valves are not equipped with actuators or position indication and the test connections required for exercising are accessible only during shutdowns and only when the drywell is de-inerted. They cannot be exercised each cold shutdown because the drywell is not routinely de-inerted each cold shutdown. The licensee has implied that these valves and the accumulators supplied through them need to be operational only while the safety/relief valve associated with each accumulator is being exercised. This is incorrect in that failure of an accumulator requires that the associated safety/relief valve be declared inoperable for its automatic depressurization function whenever the automatic depressurization system is required to be operable. The licensee should correct this statement.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns and the burden on the licensee if these Code requirements were imposed, full-stroke exercising these valves during cold shutdowns and refueling outages when the drywell is de-inerted to allow access should demonstrate proper valve operability and, therefore, relief may be granted from the exercising requirements of Section XI as requested.

4.16 Standby Gas Treatment System

4.16.1 Category B Valves

4.16.1.1 Relief Request. The licensee has requested relief from testing the following valves in accordance with Section XI, Paragraph IWV-3400, and proposed to functionally test them in accordance with station surveillance procedures.

SGT-249AV and -250AV: Train A and B suctions

SGT-251AV and -252AV: Train A and B discharges

SGT-255AV and -256AV: Train A and B bypasses.

4.16.1.1.1 Licensee's Basis for Requesting Relief--Cooper Nuclear Station Technical Specification 4.7.B requires a monthly 10-hour system operability test to demonstrate both system and component operability. If this test is not completed satisfactorily, a Limiting Condition of Operation is entered requiring either equipment repair or plant shutdown.

The above valves are tested in accordance with Surveillance Procedure 6.3.19.1. This testing is conducted monthly during system operability testing. Air flow in all piping and duct work is observed to ensure full system functionality. Should one of these valves fail to allow specified flow, corrective action would be required.

Alternative Test:

In lieu of Section XI testing, the SGT valves will be tested in accordance with Surveillance's Procedure 6.3.19.1. This will meet or exceed the requirements of Section XI.

4.16.1.1.2 Evaluation--The licensee has not supplied sufficient technical information that demonstrates that the proposed alternate testing is at least equivalent to the testing required by Section XI. The licensee has not identified these valves in the IST program, Appendix B, "Normal Operating Time," therefore, the assumption must be made that the stroke time of these valves is not being measured while being functionally tested because a limiting stroke time value has not been assigned. On this basis, the licensee's proposed alternate testing does not meet the requirements of Section XI.

Since the licensee has not demonstrated the impracticality of testing these valves in accordance with the requirements of Section XI and the licensee's proposed alternate testing does not meet the requirements of Section XI, Paragraphs IWV-3413(a), (b), and -3417(a); therefore, relief may not be granted from the requirements of these Paragraphs as requested.

APPENDIX A
VALVES TESTED DURING COLD SHUTDOWNS

APPENDIX A
VALVES TESTED DURING COLD SHUTDOWNS

The following are Category A, B, and 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. The reviewer has evaluated all valves in this Appendix and agrees with the licensee that testing these valves during power operation is not practical due to the valve type, location, or system design. These valves either cannot or should not be exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

1. RESIDUAL HEAT REMOVAL SYSTEM

1.1 Category A Valves

Valves RHR-MO-17 and -18, residual heat removal shutdown cooling suction isolations, cannot be exercised quarterly during power operation because they are interlocked shut for pressure isolation. Opening these valves during operations could possibly allow high pressure reactor coolant into the low pressure suction lines of the residual heat removal system, therefore, it is essential that these valves remain closed during plant operation. These valves will be full-stroke exercised and stroke timed during cold shutdowns in accordance with IWV-3412(a).

Valves RHR-MO-32 and -33, reactor vessel head spray supply isolations, cannot be exercised during power operation because they are interlocked shut with reactor pressure in order to help prevent an intersystem LOCA. These valves will be full-stroke exercised and stroke timed during cold shutdowns in accordance with IWV-3412(a).

1.2 Category B Valves

Valves RHR-920-MV and -921-MV, augmented off-gas system steam supply isolations, cannot be exercised during normal plant operation without causing significant augmented off-gas system transients which could include a fast or uncontrolled burn of the hydrogen gas in the off-gas piping buried under the plant. Also, routine quarterly testing of either of these two valves could cause a release of radioactive material several magnitudes above normal release activities. These valves will be full-stroke exercised and stroke timed during cold shutdowns in accordance with IWV-3412(a).

2. REACTOR RECIRCULATION SYSTEM

2.1 Category B Valves

Valves RR-MO-53A and -53B, reactor recirculation pump discharges, cannot be exercised during power operation because closure of either of these valves would reduce recirculation flow and result in reactor water temperature transients and reactivity transients. These transients would reduce control power distribution and fuel usage. This could lead to decreased fuel reliability and increase the possibility of a fuel element failure. In addition, failure of these valves during operation would require reactor shutdown due to inaccessibility. Failure of either of these valves in a nonconservative position during testing could result in the loss of a safety subsystem. The safety design basis of the residual heat removal system requires the reactor recirculation pump discharge valves to shut in a specified time window so that low pressure coolant injection flow is not short circuited through a postulated double-ended recirculation pump suction line break. These valves will be full-stroke exercised and stroke timed during cold shutdowns in accordance with IWV-3412(a).

APPENDIX B
P&ID LISTING

APPENDIX B

P&ID LISTING

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

System	P&ID	Revision
Core Spray	2045	N14
Residual Heat Removal	2040	N17
Standby Liquid Control	2045	N14
High Pressure Coolant Injection	2041 2044	N29 N17
Reactor Core Isolation Cooling	2041 2043	N29 N10
Reactor Feedwater	2044	N1[illegible]
Main Steam	2041 2028	N29 N12
Reactor Recirculation	2027	N23
Reactor Water Cleanup	2042-Sh. 1	N09
Radwaste	2038	N08
Primary Containment	2022	N21
Atmospheric Containment Atmosphere Dilution (ACAD)	2084	N09
Control Rod Drive	2039	N19
Service Water-Diesel Generator	2077	N09
Service Water	2006-Sh. 1 2036	N14 N28
Reactor Building Closed Cooling	2031-Sh. 1 2031-Sh. 2	N06 N15
Diesel Generator-Starting Air	2077	N09

System	P&ID	Revision
Excess Flow Check Valves	2041	N29
	2045	N14
	2027	N23
	2028	N12
Suppression Chamber Vent	2027	N23
Instrument Air	2010-Sh. 2	N17

APPENDIX C
IST PROGRAM ANOMALIES IDENTIFIED IN THE REVIEW

APPENDIX C

IST PROGRAM ANOMALIES IDENTIFIED IN 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. The licensee has not included the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, and the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B, in the request for relief from measuring bearing temperature annually. The licensee should be required to address this item. (See Item 3.1.1)

2. The licensee should be required to measure vibration in accordance with Section XI during pump tests until an IST program revision has been provided to and approved by the NRC staff that is in agreement with the requirements of ANSI/ASME OM-6, Draft 8, as stated in Item 3.1.2. The licensee should also be required to measure vibration on the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, and the diesel generator fuel oil transfer pumps, DG-FOT-1A and -1B. (See Item 3.1.2)

3. The licensee should be required to conduct the tests of the high pressure coolant injection pump, HP-1, in accordance with Section XI. The licensee has not identified the request for relief, RP-05, in the high pressure coolant injection section of the body of the pump testing program. (See Item 3.3.1)

4. The licensee should provide the NRC staff with a relief request that describes how inlet pressure measurements are taken and how lubricant level is observed on the submerged service water pumps, SW-1A, -1B, -1C, and -1D. (See the body of the pump testing program, service water system and Item 3.4.1)

5. The licensee should be required to test the reactor equipment cooling pumps, REC-1A, -1B, -1C, and -1D, in accordance with Section XI. (See Items 3.5.1, 3.1.1, and 3.1.2)

6. The licensee should be required to test the diesel fuel oil transfer pumps, DG-FOT-1A and -1B, in accordance with Section XI. (See Items 3.6.1, 3.1.1, and 3.1.2)

7. The licensee should be required to comply with Section XI, Paragraphs IWV-3426 and -3427, when leak testing containment isolation valves. (See Item 4.1.1.1)

8. The licensee has included valve RHR-CV-23, reactor vessel head spray supply check, in Technical Justification TJV-03 but has not included this valve in the body of the valve testing program. The licensee stated at the working meeting that this valve was scheduled to be removed from the system during the outage in the fall of 1986 and that if it was not removed, it would be included in the IST program. This item will require further verification.

9. Technical Justification TJV-03 states that valves RHR-MO-32 and -33, reactor vessel head spray supply isolations, can be exercised only during cold shutdowns and then goes on to state that they will be exercised during refueling outages. It is the reviewer's opinion that this inconsistency is a typographical error and that these valves will be exercised during cold shutdowns as described in the body of the valve testing program. It should also be noted that the licensee has identified these valves as passive valves. The licensee should be required to correct this item. (See Appendix A, Item 1.1)

10. The licensee should be required to continue the disassembly/inspection program on valve RHR-CV-20, service water emergency core flooding supply check, during each refueling outage. (See Item 4.3.1.2)

11. The licensee has incorrectly identified the residual heat removal system pressure maintenance supply check valves as core spray system valves in Relief Request RV-15. The licensee should be required to correct this item.

12. The licensee has failed to describe how valve HPCI-CV-15, high pressure coolant injection turbine exhaust check, is full-stroke exercised quarterly during extended shutdowns when no steam is available to operate the turbine. The licensee should be required to correct this item. (See the body of the valve testing program, High Pressure Coolant Injection Section.)

13. The licensee should be required to continue the disassembly/inspection program on valve HPCI-CV-11, high pressure coolant injection torus suction check, during each refueling outage. (See Item 5.5.2.2)

14. The licensee has incorrectly identified reactor core isolation cooling valve RCIC-LVSC-42 as the RCIC turbine drain to the torus when it is the RCIC barometric condenser vacuum pump discharge to the torus. The licensee should be required to correct this item. (See Relief Request RV-25 and the body of the valve testing program, Reactor Core Injection Cooling Section.)

15. The licensee should be required to continue the disassembly/inspection program on valve RCIC-CV-11, reactor core isolation cooling torus suction check, during each refueling outage. (See Item 4.6.2.2)

16. The licensee has incorrectly identified the relief request that applies to the main steam isolation valves in the body of the valve testing program, Main Steam Section. The applicable relief request is Relief Request RV-04 instead of Relief Request RV-05. The licensee should be required to correct this item. (Also see Item 4.8.1.1)

17. The licensee should be required to measure the stroke time of valves CRD-CV-126 and -127, control rod scram inlet and outlet, or to provide a relief request that explains why it cannot be done. (See Item 4.11.2.1)

18. The licensee should be required to include valve CRD-CV-138, control rod drive cooling water header check (137 valves), in the IST program because this valve performs a safety-related function by having to shut during a control rod scram to prevent diversion of scram water flow away from the scram flow path in the event the cooling water header became depressurized. (See Section 4.11)

19. The licensee has incorrectly identified the diesel generator service water supply check valves in Relief Request RV-09. The correct valve numbers should be SW-CV-35CV, -36CV, -37CV, and -38CV. The licensee should be required to correct this item. (See Item 4.12.1.1)

20. The licensee should be required to test valves SW-MO-37, reactor building and diesel generator supply header cross connection, SW-MO-117, turbine building service water supply, SW-MO-886, -887, -888, and -889, reactor equipment cooling system/service water cross connections, and SW-MO-650 and -651, reactor equipment cooling heat exchanger service water outlets, in accordance with the requirements of Section XI. Additionally, the licensee has incorrectly identified these valves as passive in Relief Request RV-32. (See Item 4.13.1.1)

21. The licensee should be required to test the following valves in accordance with Section XI.

REC-MO-694 and -695:	Loop A and B cross connections
REC-MO-697 and -698:	Critical service return header isolations
REC-MO-700:	Noncritical service supply isolation

REC-MO-702 and -709: Containment cooling supply and return isolations

REC-MO-712 and -713: Reactor equipment cooling heat exchanger inlets

REC-MO-711 and -714: Reactor equipment cooling heat exchanger outlets

REC-MO-721 and -722: Reactor equipment cooling pump suction noncritical return

REC-MO-1329: Radwaste supply isolation.

The licensee has incorrectly described the function of valves REC-MO-697, -698 and -700 in Relief Request RV-13. The licensee should be required to correct this item. (See Item 4.14.1.1)

22. The licensee should be required to verify the closure capability of valve REC-CV-16, noncritical cooling return header check, in accordance with the requirements of Section XI. (See Item 4.14.2.1)

23. The licensee should be required to test valves SGT-249AV, -250AV, -251AV, -252AV, -255AV, and -256AV in accordance with Section XI. The licensee has also incorrectly identified valve SGT-252AV in Relief Request RV-37 as valve SGT-253AV. (See Item 4.16.1.1)

24. The licensee has not provided a request for relief from the valve stroke time trending requirements of Section XI, Paragraph IWV-3417(a), for rapid acting valves in the IST program, therefore, the licensee should be required to comply with this Code paragraph.

25. The licensee has failed to include the diesel generator air start solenoids in the IST program or to propose any alternate testing for those valves. These valves are safety-related and should be included in the IST program and tested as closely as possible to the requirements of Section XI. The licensee should be required to comply with this position.

26. The following relief requests have been determined to be unnecessary because the licensee is meeting the Code requirements. For the sake of clarity, each relief request is listed according to system, relief request number, valve(s) number, and a very brief explanation why the request is unnecessary.

a. Standby Liquid Control System

a.1 Relief Request RV-19

a.1.1 Valves SLC-14A and -14B

a.1.1.1 These are the explosive injection valves. This relief request is unnecessary because Section XI, Paragraph IWV-3610, does not require that Category D valves be exercised, only that 20% of the charges be tested every two years.

b. Service Water System

b.1 Relief Request RV-35

b.1.1 Valves SW-CV-19, -20, -21, and -22

b.1.1.1 These are the residual heat removal service water booster pump discharge check valves and are being full-stroke exercised with system flow. This relief request is unnecessary because Section XI, Paragraph IWV-3522, allows the use of system flow to full-stroke exercise check valves.

b.2 Relief Request RV-33

b.2.1 Valves SW-CV-10, -11, -12, -13, -27, and -28

b.2.1.1 These are the service water pump discharge check valves and the reactor equipment cooling heat exchanger service water supply check valves. This relief request is unnecessary because Section XI, Paragraph IWV-3522, allows the use of system flow to full-stroke exercise check valves.

c. Diesel Generator Fuel Oil Transfer System

c.1 Relief Request RV-10

c.1.1 Valves DG-FOT-10, -11, -12, and -13

c.1.1.1 These are the diesel generator fuel oil transfer pump discharge check valves and the diesel generator fuel oil transfer header building penetration check valves. This relief request is unnecessary because Section XI, Paragraph IWV-3522, allows the use of system flow to full-stroke exercise check valves.

d. Diesel Generator Starting Air System

d.1 Relief Request RV-08

d.1.1 Valves DG-SA-10-CV, -11-CV, -12-CV, -13-CV, -14-CV, -15-CV, -16-CV, -17-CV, -18-CV, -19-CV, -20-CV, and -21-CV

d.1.1.1 These are the diesel generator starting air compressor discharge check valves, the starting air receiver inlet check valves, and the starting air receiver discharge check valves. This relief request is unnecessary because Section XI, Paragraph IWV-3522, allows the use of system flow to full-stroke exercise check valves.

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