UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF FROM INSERVICE TESTING REQUIREMENTS

ALABAMA POWER COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT NO. 1

DOCKET NO. 50-348

Introduction

Technical Specification 4.0.5 for the Joseph M. Farley Nuclear Plant, Unit No. 1 (Farley-1) states that inservice testing (IST) of ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda, as required by 10 CFR 50.55a(g). 10 CFR 50 §50.55a(g)(6)(i) authorizes the Commission to grant relief from code requirements upon making the necessary findings.

By letter dated May 1, 1979, Alabama Power Company (the licensee) submitted a pump and valve IST program for the second 20-month operation of Farley-1. The licensee's program was based on a January 1978 guidance document entitled "NRC Staff Guidance for Preparing Pump and Valve Testing Program Descriptions and Associated Relief Requests Pursuant to 10 CFR 50.55a(g)." In this submittal, the licensee requested relief from certain requirements of the ASME Boiler and Pressure Code, Section XI, 1974 Edition through the Summer of 1975 Addenda, (the Code).

The staff performed a preliminary review of the Farley-1 IST program and, by letter dated November 16, 1979, granted interim relief to the licensee until a thorough review could be completed.

The licensee's program was subsequently revised by letters from the licensee dated November 15, 1979 (Revision 1), April 21, 1980 (Revision 2), July 16, 1981 (Revision 3), and October 25, 1982 (Revision 4).

Evaluation

The licensee's IST program and requests for relief, through Revision 1, have been reviewed by the staff's contractor EG&G Idaho, Inc. The contractor's evaluations and recommendations, based on the staff's guidance (Attachment 1), were submitted in its Safety (Technical) Evaluation Report (Attachment 2). The guidance in Attachment 1 was also provided to licensees by letter dated September 26, 1979.

We have reviewed the EG&G report and agree with its findings, and we approve the actions that are recommended. Using modified criteria that is cognizant of the 1980 Edition of the ASME code, the staff has also reviewed Revisions 2, 3 and 4 and the licensee's associated requests for relief. Our evaluations are presented in a Supplemental Technical Evaluation (Attachment 3).

Based on the findings in Attachments 2 and 3 the staff has reached the conclusions that are tabulated below.

A. Pumps For Which The Requested Relief Is Denied

None.

B. Pumps For Which The Requested Schedular Relief Is Approved

System	Pump
Charging (HHSI)	P002 A,B,C
Residual Heat Removal	P001 A,B
Component Cooling Water	P001 A,B,C
Service Water	P001 A,B,C,D,E
Auxiliary Feedwater	P001 A,B
Auxiliary Feedwater	P002
Containment Spray	P001 A,B
River Water	P004-B
River Water	P005-B
River Water	P008-A
River Water	P009-A
River Water	P010-A

The licensee requested relief from measuring some, or all, of the parameters required by IWP-3100 on a monthly frequency according to the 1974 Edition of the ASME Code. In the 1980 Edition of the ASME Code, this frequency has been extended to every 3 months. The recommendations in the EG&G TER are consistent with this Code change.

C. Valves For Which Limited Relief Is Approved

System Name	System Number	Valve Number
RHR/LHSI	Q 1E11	V025 A, B
Containment Spray	Q 1E13	V003 A, B V014
HHSI	Q 1E21	V032 A, B, C V037 A, B, C

Valves Q1E11V025 A, B and Q1E13V003A, B

Farley Unit 1 is designed so that both RHR pumps and both Containment Spray pumps can take suction from the containment sump for recirculation cooling of the core during a post-LOCA event. Each of these pumps is isolated from the containment sump by redundant motor operated valves (V025 A&B for RHR and V003 A&B for containment spray). These Category A valves are normally closed and the sump and suction lines are dry.

The inboard (primary isolation) valve in each of the four suction lines is located outside of containment but is enclosed so as to form an extension of the containment pressure boundary. Inasmuch as movement of the valves cannot be determined visually unless the cover is removed, the licensee has requested that relief be given to permit the valves's position indication to be verified by means of remote redundant position indicators. A fully

closed position would be verified during leak testing of the valves by pressurizing the pipe between the two valves. Partial verification of an open position would be achieved at the end of the leak test by relieving pressure through the primary valve. The Code requires that valves with remote position indicators be observed at least every two years to verify that valve position is accurately indicated.

The staff has reviewed the design of these systems at the site and has discussed, in detail, the licensee's proposed alternatives for leak testing and verifying valve operation. We agree with EG&G (see Enclosure 2, pages 40 and 47) that the licensee's proposed test for operability depends solely on the accuracy of the remote position indicators that are located on the valve operator. Because of the importance of the four primary isolation valves for containment isolation and during post-LOCA recovery, we conclude that the proposed types of tests are not sufficiently acceptable as the only tests of position indication available throughout the life of the plant. Even though the difficulties associated with removal of the protective cover are recognized, the most acceptable verification procedure would be visual observation of valve movement on a frequency based on IWV-3300. Therefore, we do not agree with the licensee's basis, and the licensee's request for relief from the Code's requirements for verification of valve position indication for valves V025 A and B and V003 A and B is not approved.

Valve 01E 13V014

In its Technical Evaluation Report EG&G recommends that the licensee's request for relief for Valve V014 be approved but that the licensee continue to seek a method to fully meet the requirements of IWV-3520 by full stroking this valve during each refueling outage (See Page 51 Enclosure 2). Valve V014 is a check valve between the RWST and containment spray pump suction and full stroking is not practical during any operational mode, including refueling. The licensee proposes to partially stroke this valve during the quarterly tests of the containment spray pumps to verify its operability.

We agree with the EG&G evaluation and recommendation. It is the staff's position that when the flow required by the safety analysis in the FSAR cannot be verified by full stroking the valve or an equivalent test, the valve should be disassembled and visually inspected. The licensee however, contends that valve V014 cannot be disassembled unless the RWST is drained because there is no means of isolating the RWST.

We approve the requested relief from the requirements of the Code to perform the alternate testing. We do not, however, consider this alternative alone to be adequate to verify the operability of these valves during the total life of the plant. We recommend that the licensee further investigate a method to full stroke exercise these valves. The licensee is requested to submit the results of his investigation containing proposed test methods for compliance with the intent of the code requirement prior to the start of the next refueling outage.

Valve Q1E21 V032 A, B, C and V037A, B, C

The licensee also requested relief from the requirements of IWV-3520 for the three inboard check valves that isolate the accumulator from the RCS cold legs. These valves V032 A, B, and C and the redundant (outboard) valves V037 A, B, and C are considered by the staff to be pressure isolation valves (PIVs) (see Section H of this Safety Evaluation) and are to be categorized as AC rather than Category C as in the licensee's IST program.

We agree with the licensee's bases for not full-stroking V032 A, B, and C and V037 A, B, and C. We also recognize the practicality of the proposed alternative, i.e., partial stroking of these six valves during refueling with the accumulator at atmospheric pressure, and we approve the requested relief to perform the alternate testing. We do not, however, consider this alternative alone to be adequate to verify the operability of these valves during the total life of the plant, and recommend that the licensee further investigate a method to full stroke exercise these valves. The licensee is requested to submit the results of his investigation containing proposed test methods for compliance with the intent of the Code requirement prior to the start of the next refueling outage.

C. Valves For Which Alternative Verification Of Operability Is Approved

System Name	System Number	Valve Number
Reactor Coolant	Q 1B13	V038
		V054
RHR/LHSI	Q 1E11	V028
		V038 A, B
Containment Isolation	Q 1E14	V001
HHSI/CVCS	Q 1E21	V122 A, B, C
		V052
Liquid Waste Disposal	Q 1G21	V204
		V291
Auxiliary Steam	Q 1N12	V010 A,B
Condensate Transfer and Storage	Q 1P11	V002
Service Water	Q 1P16	V075
Component Cooling Water	Q 1P17	V159
		V083
Service Air	Q 1P18	V001
		V002
Instrument Air	Q 1P19	V002

The licensee has demonstrated that the operability of these valves cannot be determined during operation or in cold shutdown by any of the specific methods allowed in IWV-3520. Consequently, the staff has approved other methods of verification, such as leak testing or by testing associated pumps.

E. Valves For Which Testing May Be Deferred To A Refueling Outage

System Name	System Number	Valve Number	
RHR/LHSI	Q 1E11	V021 A,B,C	
		V051 A,B,C	
		V042 A,B	
Containment Spray	Q 1E13	V007 A,B	
		V002 A,B	
HHSI/CVCS	Q 1E21	V058	V264
		V115 A,B,C	V066 A,B,C
		V119	V078 A,B,C
		V213	V079 A,B,C
		V062 A,B,C	V026
		V076 A,B	V037 A,B,C
		V077 A,B,C	V210
Post Accident CTMT Venting & Sampling	Q 1E23	V021	-
Liquid Waste Disposal	Q 1G21	V005	
Spent Fuel Pool	Q 1G31	V013	
Auxiliary Feedwater	Q 1N23	V013 A,B	
		V014, A,B,C	

The licensee has demonstrated that these valves cannot be exercised during power operation or during cold shutdowns other than refueling outage. The staff has agreed with the licensee's basis and approve relief from the exercising requirements of Section XI.

F. Valves For Which Testing May Be Deferred To Cold Shutdown And Refueling Outages

System Name	System Number	Valve Number	
RHR/LHSI	Q 1E11	V001 A,B	
		V016 A,B	
		V044	
Containment Isolation	Q 1E14	V002	V003
		HV 3657	V004
		HV 3658	
HHSI/CVCS	Q 1E21	V015	V376 A,B
		V056 A,B	V016 A,B
		V063	V253 A,B,C
		V068	V259 A,B,C

System Name	System Number	Valve Number	
		V072	V265
		V249 A,B	V326 A,B
		V254	V327 A,B
		V257	V336 A, B
		V258	
Main Steam	Q 1N11	V001 A,B,C	V002 A,B,C
		V003 A,B,C,D,E,F	
Condensate and Feedwater	Q 1N21/Q1C22	FCV 478	FCV 489
		FCV 488	FCV 499
		FCV 498	V001 A,B,C
		FCV 479	
Auxiliary Feedwater	Q 1N23	V002 A,B,C,E,G	V007 A,B
		V011 A,B,C	V006
		V002 D,F,H	V003
Containment Purge	Q 1P13	V281	V283
		V282	V284
Service Water	Q 1P16	V071	V514
		V072	V515
		V081	V516
		V010 A,B,C,D	V517
		V043 A,B,C,D	
		V207 A,B,C,D	
Component Cooling Water	Q 1P17	V082	HV 3045
		V097	HV 3184
		V099	HV 3067
		HV 3443	HV 3095
Instrument Air	Q 1P19	HV3611	

The above valves have been identified by the licensee as being incapable of being tested during plant operation without placing the plant in an unsafe condition. The staff agrees with this evaluation and approves deferral of testing until an appropriate cold shutdown (including refueling).

G. Valves For Which Specific Relief From Stroke Timing Is Approved

System Name	System Number	Valve Number
RHR/LHSI	Q 1E11	V032 A, B
		V033 A, B

We agree with the licensee that these Category B flow control valves associated with the RHR heat exchangers have no active function when used in their injection mode (LHSI). The operability of the valves will be tested quarterly to assure capability to open and close for their RHR function.

H. Category A Valve Leak Rate Test Requirements For Pressure Isolation Valves

Several safety systems connected to the reactor coolant pressure boundary have design pressures below the reactor coolant system operating pressure. Redundant isolation valves within the Class 1 boundary forming the interface between these high and low pressure systems protect the low pressure systems

from pressures which exceed their design limit. In this role the valves perform a pressure isolation function. Four of these Category AC PIVs have been identified at Farley-1 as being in pipe configurations that could potentially result in a LOCA outside of containment (event V in Wash-1400). Surveillance requirements and leak-rate limitations for these four valves have consequently been included in the Technical Specifications. These valves are:

System Name	System Number	Valve Number
HHSI/CVCS	Q 1E21	V076 A,B V077 A,B

We conclude that the actions required in IWV-3420 are met by the licensee's compliance with these Technical Specifications.

The licensee has also identified the following thirteen check valves as having pressure isolation functions and has categorized them as AC in the Farley-1 IST program.

System Name	System Number	Valve Number
RHR/LHSI	Q 1E11	V021 A, B, C V051 A, B, C
HHSI	Q 1E21	V077 C V062 A, B, C V066 A, B, C

The licensee does not consider these valves to have "Event V" configurations; however, during the second, third, and fourth refueling they were leak rate tested the same as required for the Event V valves in the Farley-1 Technical Specification. We find the licensee's program for these valves to be acceptable.

Several other check valves have been identified by the staff as performing a pressure isolation function between high and low pressure systems. We have determined that the licensee should verify this capability beyond the exercising requirements of the Code. The licensee should leak rate test these valves using the same acceptance criteria as for the Event V valves in the Farley-1 Technical Specifications. These valves shall be reclassified A or AC, if not already so classified, and tested in accordance with IWV-3400 of the Code.

System Name	System Number	Valve Number
HHSI/CVCS System	Q 1E21	V032 A, B, C V037 A, B, C V078 A, B, C V079 A, B, C
RHR/LHSI	Q 1E11	V042 A, B V001 A, B V016 A, B

I. Valves For Which Relief From Testing Is Approved

Name	System Number	Valve Number
Reactor Coolant	Q 1B13	V026 A, B
Spent Fuel Pool Cooling	Q 1G31	V012
Instrument Air	Q 1P19	V004
		HV2228
Containment Cooling	Q 1P23	V002 A, B.

These are containment isolation valves that are normally closed and passive. The staff's position is that valves which are not required to change position for any operating condition of the plant are exempted from the testing (exercising) requirements of Section XI. However, their positions should be verified quarterly and each time the valve is cycled.

J. Additional Requests For Schedular Relief

The licensee has requested relief from the requirements of IWV-3410(g) and IWV-3520(c) to complete all corrective actions required, as the result of tests performed during cold shutdown, before the plant is restarted. It is the staff's position that fulfillment of the plant's Technical Specifications provides acceptable conditions for restart. Therefore, relief from the Code requirement is granted. However, the licensee must have positive plans to complete all corrective actions during future shutdowns.

The licensee also requested relief from the provisions of IWV-3410(c) for valves that are normally tested only at cold shutdown or refueling because testing during operation would place the plant in an unsafe condition. IWV-3410(c) stated that frequency of stroke-time tests shall be increased to once each month until action is taken to correct the cause of increased stroke-times. We agree with the licensee that valve stroking should not be performed during power operation if the plant is placed in an unsafe condition and, therefore, approve relief from the Code's requirement for increased testing.

K. Valves for Which Requested Relief is Denied and Testing in Accordance with IE Bulletin 83-03 is Required

Name	System Number	Valve Number
Service Water	Q 1P16	V659
		V660
		V661

These are check valves that are normally closed, but that are open to supply service water to the diesel generators for cooling. The licensee has requested relief from the exercising requirements of IWV-3520(2) and has proposed alternate testing. Based on failures experienced with such valves, as described in IE bulletin 83-03, the licensee's proposal for alternate testing is denied. It is the staff's position that even the testing required by the Code is inadequate, and the licensee is required to develop and implement procedures for testing these valves in accordance with IE Bulletin 83-03.

L. Pressurizer Power Operated Relief Valves

The NRC has adopted the position that the pressurizer power operated relief valves should be included in the IST program as Category B valves and tested to the requirements of Section XI. However, since the PORVs have shown a high probability of sticking open and are not needed for over-pressure protection during power operation, the NRC has concluded that routine exercising during power operation is "not practical" and, therefore, not required by IWV-3410(b)(1).

In lieu of quarterly testing during power operation, the NRC requires the following test schedule for the Farley 1 PORVs:

1. Full stroke exercising and stroke timing of PORVs should be performed during cooldown prior to achieving the water solid condition in the pressurizer, during cold shutdown prior to heat up or, as a minimum, once each refueling cycle.

2. Fail safe actuation testing is permitted by the Code to be performed at each cold shutdown if the valves cannot be tested during power operation. This testing should be performed at each cold shutdown.

3. The PORV block valves should be included in the IST program to provide protection against a small break LOCA should a PORV fail open.

The Joseph M. Farley Unit 1 pressurizer power operated relief valves, PCV445A and PCV445B, and associated block valves, V027A and V027B, have not been included in the IST program, therefore, these valves are not tested in accordance with the above requirements. The staff feels that these valves must be included in the IST program and tested in accordance with the above test schedule.

Overall Evaluation

The staff has determined that where stated the Code requirements are impractical, the granting of this relief is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest considering the burden that could result if they were imposed on your facilities.

Environmental Consideration

We have determined that this relief does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that this relief involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this relief.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the relief does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, the action does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operating in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this action will not be inimical to the common defense and security or to the health and safety of the public.

Date: MAY 02 1983

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GUIDANCE CONCERNING INSERVICE TESTING OF PUMPS AND VALVES

Following are staff positions used to determine the adequacy of Inservice Testing Programs and to grant relief from ASME Section XI requirements, where appropriate.

I. A. Scope

All valves important to safety (e.g., required to shut down the plant to cold shutdown, maintain the plant in cold or hot shutdown condition, or mitigate the consequences of an accident) should be included in the IST program. Pressure relief valves should not be omitted from the program.

B. Testing Intervals

1. Quarterly testing required by the Code should be performed unless impractical.

2. If quarterly testing is not possible the next interval to be considered is cold shutdown.

3. Testing at refueling is the longest acceptable interval.

C. Exceptions to Testing Requirements

1. Passive Gate Valves - Gate valves which are not required to change position for any operating condition of the plant are exempted from the testing requirements of Section XI. However, their positions should be verified quarterly and each time the valve is cycled.

2. Check Valves, Control Valves and Relief Valves - The measurement of stroke times is meaningless for these valves. Relief, if requested, should be granted.

3. Valves should be exercised at intervals as close as practical to those required by the Code. When full stroking is not practical on a quarterly basis, part stroking quarterly is acceptable when supplemented by full stroking on a cold shutdown or refueling basis.

4. Valve tests should not be performed such that they place the plant in an unsafe condition (e.g., failure might constitute a loss of system function).

5. Valves with very fast closing times (e.g., less than 2 seconds) may be exempted from the stroke time measurement and acceptance criteria as these are difficult to accomplish. In such cases, however, it is important to establish reasonable alternatives. Measurement to the nearest ½ second and corrective action based on a change of 1 second or more are considered acceptable.

D. Unacceptable Relief Requests

1. A relief request based solely on radiation exposure to test personel is not considered sufficient.

2. Relief from full stroking a valve at some time is not usually granted.

3. A relief request describing a check valve as a passive component, therefore not needing exercise, is not granted.

4. Relief from verifying remote position indicators at least each two years is not granted.

5. Some licensees have proposed to use the "Maximum acceptable stroke time" as delineated in their FSAR as the value at which corrective action is required. This is not considered an acceptable alternative. For example, a valve's operating time may be acceptable up to a value of 30 seconds to satisfy FSAR commitments. However, the valve actually operates in 10 seconds. It is readily obvious that considerable degradation could occur without any requirement for corrective action.

6. Nonspecific relief requests (e.g., plant management to determine whether or not a valve is considered inoperable, plant management to determine conditions for restart, etc.) are not acceptable.

E. Special Cases

1. Corrective Action - When a valve is found to be inoperable at cold shutdown with respect to Code acceptance criteria the use of plant Technical Specifications to determine acceptable conditions for restart has been accepted. However, it should be accompanied by positive statements concerning the plan of action to correct the inoperable status.

2. Past experience has indicated that certain valves are extremely hard to full stroke test, as follows:

a. Accumulator or Core Flood Tank Check Valves (PWRs)

b. Containment Sump Recirculation Suction Check Valves (PWRs)

c. Containment Spray Check Valves (BWRs and PWRs)

Relief requests pertaining to these components should be referred to the MEB reviewer.

F. Containment Isolation Valves (CIV) and Pressure Isolation Valves (PIV)

All PIVs and CIVs should be Category A or AC.

1. PIVs (valves which form the barrier between high and low pressure systems) should have their leak tight integrity and operational readiness (exercise, etc.) verified in accordance with Section XI of the ASME Code.

2. CIVs (valves which penetrate the containment boundary and communicate with either the containment atmosphere or the reactor coolant system) should be redundant for each penetration and should have their leak tight integrity verified in accordance with Appendix J to 10 CFR 50. These valves must also have their operational readiness (exercise, etc.) verified in accordance with Section XI of the Code.

3. CIV/PIV (valves which perform both a containment isolation function and a pressure isolation function, though not necessarily at coincident times) must be tested to both verify their operational readiness in accordance with ASME Section XI and leak tight integrity in accordance with Appendix J to 10 CFR 50 and ASME Section XI.

G. Deviations in Leak Test Mediums

It is acceptable to leak test a valve with air and analytically determine the equivalent water leakage if the licensee has provided the correlation between the leakages of these two mediums.

II. PUMPS

A. Pumps

All pumps supplied with an emergency power supply are to be included in the program.

B. Testing Intervals

The 1974 and 1977 editions of the ASME Code required pump testing monthly. However, the 1980 Code has increased the acceptable interval to quarterly. Relief to test on a quarterly basis is usually granted for individual pumps if a reasonable basis is provided. However, it should be demonstrated that the individual pump will not suffer degradation if exercised only at 90-day intervals.

C. Bearing Temperature

Relief from measuring this parameter is generally granted if a reasonable basis is provided.

D. Other Relief Requests

Relief requests pertaining to other than the measurements of bearing temperature and testing intervals should be referred to the MEB reviewer.

Attachment 2

EG&G Idaho, Inc.

FORM EG&G-038
Rev. 11-79)

INTERIM REPORT

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Victor Nerses, NRC-DE

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

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Idaho Falls, Idaho 83415

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INTERIM REPORT

TABLE OF CONTENTS

I. Introduction

Contained herein is a safety evaluation of the pump and valve inservice testing (IST) program submitted by the Alabama Power Company on 1 May 1979 for its Joseph M. Farley nuclear plant. The program applies to Joseph M. Farley for the period 1 August 1979 through 30 April 1981. The working session with Alabama Power and Joseph M. Farley representatives was conducted on September 26 and 27, 1979. The licensee re-submittal was issued on 16 November 1979 and was reviewed by EG&G Idaho, Inc., to verify compliance of proposed tests of safety related class 1, 2, and 3 pumps and valves with requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition, through the Summer of 1975 Addenda. Alabama Power Company has also requested relief from the ASME Code from testing specified pumps and valves because of practical reasons. These requests have been evaluated individually to determine whether they have significant risk implications and whether the tests, as required, are indeed impractical.

The evaluation of the pump testing program and relief requests for pumps is contained in Section II below; the evaluation of the valve testing program and associated relief requests is contained in Section III. All evaluations for Section II and III are the recommendations of EG&G Idaho, Inc.

Category A, B, and C valves that meet the requirements of the ASME Code Section XI and are not exercised every 3 months are contained in Attachment I.

A listing of P&ID's used for this review are contained in Attachment II.

Valves that are never full stroke exercised or that have a testing interval greater than each refueling outage and relief requests with insufficient technical basis where relief is not recommended are summarized in Attachment III.

II. Pump Testing Program

The IST program submitted by Alabama Power Company was examined to verify that Class 1, 2, and 3 safety related pumps were included in the program and that those pumps are subjected to the periodic tests as required by the ASME Code, Section XI. Our review found that all Class 1, 2, and 3 safety related pumps were included in the IST program and, except for those pumps identified below for which specific relief from testing has been requested, the pump tests and frequency of testing comply with the code. Each Alabama Power Company request for relief from testing pumps, the code requirement for tesing, the basis for requesting relief, and the EG&G evaluation of that request is summarized below and grouped according to the system in which the pumps reside:

A. Charging (HHSI) System

1. Relief Request

The licensee has requested specific relief from measuring vibration amplitude (V), lubricant level or pressure, and differential pressure (dP) for the Charging (HHSI) pumps P002A, B, and C in accordance with the requirements of Section XI and proposed to run pumps monthly and measure inlet and outlet pressure. In addition, V, dP, and lubricant level or pressure will be measured quarterly. Bearing temperature will be measured annually.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

In order to comply with this test requirement for the Charging/HHSI pump dP, the pumps must be aligned to their fixed resistance recirculation flow path. This alignment to the test configuration requires that normal charging and RCP seal water requirements must be provided from a pump in the other train and isolation of the pump train to be tested. The pump now providing normal charging and seal water must be provided with its cooling water from the appropriate train source which may cause realignment in that system and its support systems. The pump now aligned in the test configuration is not available for charging or HHSI.

In addition, the normal charging and seal supply configuration is not considered fixed resistance and adequate flow instrumentation is not provided.

A test parameter of dP will be determined while the pumps are operating, either normally or in accordance with the alternate testing specified in paragraph 2.1.1.2, in their normal operating configuration providing charging and RCP seal requirements. The acceptable limit for each pump's dP will be equivalent to 93% of the manufacturer's curve at a maximum charging and recirculation flow of 180 GPM ($dP \geq 2315$ psi). Inability to meet this criterion will result in corrective action as provided in paragraph 2.1.1.2. The dP parameter will be measured, compared, and analyzed in accordance with code nominally once every 3 months.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for charging (HHSI) pumps P002A, B, and C from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing frequency is sufficient to determine any pump degradation (the intent of Section XI). In addition, the establishment of two reference values for these pumps will provide the required degradation information whether the pump is lined up to the normal charging flow path or the recirculation flow path. We conclude that the licensee's proposal of running pumps monthly to measure Pi and Po to ensure no pump degradation and of measuring all parameters quarterly and bearing temperature yearly, meets the intent of the Section XI testing requirements.

3. Residual Heat Removal (RHR) System

1. Relief Request

The licensee has requested specific relief from measuring vibration amplitude (V) and lubricant level or pressure for

RHR pumps P001A and B from the testing requirements of Section XI and proposed to measure these parameters quarterly. Inlet pressure Pi, outlet pressure Po, differential pressure dP, and flow rate Q will be measured monthly and bearing temperature will be measured yearly.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for

inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

In order to satisfy the test requirement for dP, each pump must be aligned to a fixed resistance recirculation flow path. In the event the system is providing reactor coolant

flow or is aligned to do so, each of the pumps must be realigned for the test while the other pump is realigned to satisfy reactor coolant flow requirements. The test configuration also requires the train to be isolated from the RCS and aligned to the RWST. This test configuration jeopardizes the overpressurization protection requirements outlined in the Technical Specifications.

Test parameters will be measured and acceptability determined in accordance with the following:

Test	RCS	Pump Function	Parameter Measured	Acceptance Criteria	Criteria Basis
(1)	Power Operation or Pressure ≥450 psig	ECCS	dP, each pump	Per Test Requirement (2.1.11)	Code
(2)	Pressure <450 psig and/or temperature ≥310°F, RC Pump(s) Operating.	Aligned to RCS for RHR	dP, each pump	>126.5 psid	0.93Δ Pc* Qc*=3000 GPM
(3)	Pressure <450 psig and/or temperature ≥310°F, RC Pump Not Operating.	Reactor Coolant Flow	Q, each pump	>3000 GPM	Tech. Spec.

* Where Qc and dPc are points on the mfg. curve.

Inability to meet these criteria will result in corrective action as provided in paragraph 2.1.1.2. The alternate tests (2) or (3) will not be conducted coincidently with the quarterly requirements of Table P-1 and paragraph 2.1.1.2. In the event the quarterly requirements of Table P-1 and Test (1) are required when the RCS condition is as specified in tests (2) or (3), tests (2) or (3) will be conducted in lieu of the quarterly requirements. The Quarterly Test Parameters and the test (1) parameter will then be measured, compared, and analyzed in accordance with the test requirement (2.1.11) within one (1) week after the plant is returned to normal operation.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for RHR pumps P001A and B from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing frequency is sufficient to determine any pump degradation. We conclude that the proposal of running pumps monthly to measure Pi, Po, dP, and Q to ensure pump degradation has not occurred, and to measuring all parameters quarterly, and bearing temperature yearly meets the intent of the Section XI testing requirements. Also, we agree that the proposed operating and acceptability criteria meets the intent of the Section XI requirements.

C. Component Cooling Water (CCW) System

1. Relief Request

The licensee has requested specific relief from measuring inlet pressure Pi, outlet pressure Po, differential pressure dP, vibration amplitude V, and lubricant level or pressure,

for Component Cooling water pumps P001A, B, and C from the testing requirements of Section XI and proposed to run these pumps monthly and measure flowrate Q to determine pump degradation. In addition, Pi, Po, dP, Q, V, and lubricant level or pressure will be measured quarterly and bearing temperature will be measured yearly.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate

assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every three (3) months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

The flow measuring devices for the Component Cooling Water System are located downstream of the CCW heat exchangers and are neither designed nor strategically located to provide flow indication within sufficient accuracy to accommodate the test requirement. As a result, CCW pump dP must be measured while the pumps are aligned in a fixed resistance recirculation flow path in order to satisfy the test requirement. This alignment to the test configuration requires that each pump be manually isolated from its normal flow path each month. CCW system requirements must be met by the other CCW pumps which may cause train supply switchover for certain systems such as RHR or Charging. This alignment to a test configuration on a monthly frequency reduces pump availability and is contrary to justification for quarterly testing provided in paragraph 2.1.1.1.

A test parameter of flow (Q) will be measured while the pumps are operating, either normally or in accordance with the alternate testing specified in paragraph 2.1.1.2, in their normal operating configuration. Due to variable resistance in the system and the accuracy of the flow measurement, the flow parameter will be required to meet or exceed a heat exchanger discharge flow corresponding to hot shutdown loads ($Q \geq 6400$ GPM). Inability to meet this criterion will result in corrective action as provided in paragraph 1.1.12. ~~This a~~lternate test will not be conducted coincidently with the quarterly requirements of Table P-1 and paragraph 2.1.1.2.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Component Cooling Water pumps

P001A, B, and C from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing the proposed alternate testing frequency should determine any pump degradation. We conclude that the proposal to run pumps monthly and measure Q to ensure no pump degradation and to measure all parameters quarterly and measure bearing temperature yearly meets the intent of the Section XI testing requirements.

D. Service Water (SW) System

1. Relief Request

The licensee has requested specific relief from measuring inlet pressure Pi, outlet pressure Po, differential pressure dP, vibration amplitude V, flowrate Q, and lubricant level or pressure for Service Water Pumps P001A-E from the testing requirements of Section XI and proposed to measure these parameters quarterly and measure bearing temperature yearly.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of

performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal

operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

The service water pumps are of vertical design with no means of direct inlet pressure measurement as required by IWP-4200.

Indirect inlet pressure measurement will be obtained utilizing service water structure wet pit station level instrumentation. The level is then converted to pump inlet pressure by the following calculation:

$$\text{Inlet Pressure} = \frac{\text{Wet Pit Level (ft.)} - 152.5 \text{ ft.}}{2.3066 \text{ ft/psig}}$$

Due to the demands of dependent systems, the individual testing of service water pumps as required by IWP-3400 would jeopardize safe plant operation and be impossible to accomplish during plant shutdown.

Tests involving combinations of two pumps within each train indicate the hydraulic condition of the pumping system. The combinations are arranged such that each pump is included in at least one combination test in each train. The initial

tests are run on all combinations in each train including the swing pump to provide base line data for any subsequent tests. In the event of a detection of hydraulic change by a test, the test results are applied to both pumps in the combination. Each of the pumps is then tested in combination with another appropriate pump to assess the individual pump operational readiness.

As indicated in paragraph 2.1.3.1, the service water pumps cannot be individually tested. The pumps must be tested quarterly by train [two (2) pumps] as a variable resistance system. This is accomplished by throttling the flow to a repeatable quantity and measuring the dP. The monthly measurement of a single hydraulic parameter, as allowed in paragraph 2.1.1.2 and comparison per the test requirement, is meaningless since either flow (Q) or differential pressure (dP) is readily attainable regardless of pump operability. The monthly measurement of both hydraulic parameters imposes extended abnormal operating conditions on the pumps and system in order to attain the repeatable values and defeats the purpose implementing quarterly tests as provided in paragraph 2.1.1.1.

A test parameter of flow (Q) will be measured for each train [two (2) pumps operating in each train]. The swing pump will be operated with either of the pumps in the train to which it is aligned and flow will be measured for the train. The pumps will be operationally acceptable if the test flow meets or exceeds a quantity equivalent to the cold shutdown requirements for that system train ($Q \geq 15{,}200$ GPM). Inability to meet these criteria will result in corrective action as provided in paragraph 2.1.1.2. The flow parameter will be measured, compared, and analyzed in accordance with the Code nominally once every 3 months.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Service Water Pumps P001A-E from the testing requirements of Section XI. The licensee has demonstrated that through previously conducted testing the proposed alternate testing frequency is sufficient to determine any pump degradation. Due to present piping configurations, installed instrumentation, and system flow requirements, we agree that the service water pumps can only be tested using two pumps in parallel instead of individually as required by Section XI. We conclude that since these pumps are running continously during power operation performing their required safety function that measuring Pi, Po, dP, Q, V, and lubricant level or pressure quarterly, and bearing temperature yearly is sufficient to ensure no pump degradation and does meet the intent of the Section XI testing requirements.

E. Auxiliary Feedwater

1. Relief Request

The licensee has requested specific relief from measuring vibration amplitude V, and lubricant level or pressure for the motor driven Auxiliary Feed Pumps P001A & B in accordance with the requirements of Section XI and proposed to measure inlet pressure Pi, outlet pressure Po, and differential pressure dP monthly, and measure V and lubricant level or pressure quarterly. Bearing temperature will be measured annually.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for the motor driven Auxiliary Feed Pumps P001A-A & B from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate

testing frequency is sufficient to determine any pump degradation. We conclude that running pumps monthly to measure Pi, Po, and dP to ensure pump degradation has not occurred and to measure all parameters quarterly and bearing temperature yearly meets the intent of the Section XI testing requirements.

2. Relief Request

The licensee has requested specific relief from measuring differential pressure dP, flowrate Q, vibration amplitude V, lubricant level or pressure, and speed for the turbine driven Auxiliary Feed pump P002 in accordance with the requirements of Section XI and proposed to measure inlet pressure Pi, outlet pressure Po, (dP and Q with more limiting required action ranges) monthly, and V, lubricant level or pressure and speed quarterly. Bearing temperature will be measured annually.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides

such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a

single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

The plant Technical Specifications require that the pumps be tested at least once per 31 days by verifying that the pump develops a differential pressure of at least 93% for the applicable flow rate as determined from the manufacturer's pump performance curve when the secondary steam supply pressure is greater than 90 psig. A test in accordance with the Code requires a different hydraulic test circuit than the Technical Specification test in order to obtain a fixed resistance recirculation flow path because the flow device used in the Tech. Spec. test is not designed for the accuracy limitations of the Code. As a result, tests performed monthly and quarterly as described in paragraph 2.1.1 would require two (2) separate tests with two (2) separate system alignments and an increased test duration.

The monthly test required by the Tech. Spec. accomplishes the same purpose as the Code test with a more conservative allowable range for test quantities in the required action range. For example:

	Code	Tech. Spec.
Req'd. Action if	$\Delta P < 0.90\ \Delta P_r$ or $> 1.03\ \Delta P_r$	$\Delta P \leq 0.93\ \Delta P_c$*
Req'd Action if	$Q < 0.90\ Q_r$ or $> 1.03\ Q_r$	$Q = Q_c$*

* Where Qc and dPc are points on the mfg. curve.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for the turbine driven Auxiliary Feed pump P002 from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing frequency is sufficient to determine any pump degradation. We conclude that the proposal of running pumps monthly to measure Pi, Po, dP, and Q to ensure pump degradation has not occurred and to measure all parameters quarterly and bearing temperature yearly meets the intent of the Section XI testing requirements. Also, we agree that the proposed dP and Q required action ranges are more restrictive than the Section XI requirements, thus the code intent is met.

F. Containment Spray

Relief Request

The licensee has requested specific relief from measuring vibration amplitude V, and lubricant level or pressure for the Containment Spray pumps P001A-A & B in accordance with the requirements of Section XI and proposed to measure inlet pressure Pi, outlet pressure Po, and differential pressure monthly, and measure V and lubricant level or pressure quarterly. Bearing temperature will be measured annually.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for the Containment Spray pumps P001A-A & B from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing frequency is sufficient to determine pump degradation has not occurred. We conclude that the proposal to measure Pi, Po, and dP monthly, and to measure all parameters quarterly and bearing temperature yearly meets the intent of the Section XI testing requirements to demonstrate pump operability.

3. River Water

Relief Request

The licensee has requested specific relief from measuring inlet pressure Pi, outlet pressure Po, differential pressure dP, vibration amplitude V, and lubricant level or pressure for the River Water pumps P004-B, P005-B, P008-A, P009-A, and P010-A in accordance with the requirements of Section XI and proposed to measure Po monthly, and Pi, dP, V, and lubricant level or pressure quarterly. Bearing temperature will be measured annually.

Code Requirement

An inservice test shall be conducted on all safety related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

Licensee's Basis for Requesting Relief

The intent of imposing the pump testing program is to provide assurance of an increased level of plant safety obtained by verifying that the pumps are capable of performing their safety function. A monthly test provides such assurance; however, monthly testing also requires additional run times and unusual operation of the equipment necessary to drive the pump and to align the system for the test. A penalty for increased usage and run time is increased equipment degradation and possible failure. An optimized testing program would provide assurance of pump operability and have the least impact on the normal

degradation of equipment expected over its service lifetime. Operating experience has indicated that pumps will not degrade over a single 30-day period. Of the approximately 24 monthly tests previously conducted on each of the pumps in the Farley Unit No. 1 program, adequate assurance of operability is provided in as few as eight 3-month tests. In addition, extensive investigation has been conducted within the ASME Section XI Subgroup for inservice testing of pumps and valves concerning the optimization of the test frequency. The investigation has resulted in a proposed revision to the code which would require a pump test frequency of nominally once every 3 months.

The pumps will be tested and the required parameters measured nominally once every three (3) months. If deviations fall within the "alert range" of Table IWP-3100-2, the frequency of testing shall be increased to monthly until the cause of the deviation is determined and corrected and either the existing reference values reverified or a new set established per IWP-3111.

In addition, the pumps will be operated nominally once every month to maintain the lubrication of the pump bearings and to prevent other undesirable occurrences. The test will require the pumps to be run in either their test or normal operating configuration for at least five (5) minutes and a single hydraulic parameter to be measured to detect any gross degradation of the pumps or the system in which they operate. In cases of multiple pump operation within a system or train of a system, a system or train parameter will be measured and used to verify that the pumps are operating sufficiently to satisfy system requirements. The parameters to be measured monthly are indicated in Table P-1. Any pumps whose measured parameters indicate unsatisfactory performance will be retested within 48 hours and parameters measured in accordance with the quarterly test interval indicated in Table P-1. Any further corrective action will result from the quarterly test parameters.

The river water pumps are of vertical design with no means of direct inlet pressure measurement as required by IWP-4200.

Indirect inlet pressure measurement will be obtained by using river water structure wet pit station level instrumentation. The level is then converted to pump inlet pressure by the following calculation:

$$\text{Inlet Pressure} = \frac{\text{Wet Pit Level (ft.)} - 62.5 \text{ ft.}}{2.3066 \text{ ft/psig}}$$

Due to a continuously fluctuating river level and the fixed resistance associated with the system, the determination of readily duplicated points of operation as required by IWP-3110 is not possible.

Each pump's test results are maintained as reference values. When subsequent results provide an inlet pressure within ±2% of a previous test inlet pressure, the tests are compared and an assessment of the pump hydraulic condition is made.

Since discharge pressure instrumentation is provided for each train, single pump tests are required in order to satisfy the test requirement for dP. Starting and stopping of individual pumps and aligning the system into a test configuration for testing on a monthly basis defeats the intent and purpose of quarterly testing provided in paragragn 2.1.1.

A test parameter of discharge pressure (Po) will be measured for each train with two (2) pumps operating and providing normal pond supply. All pumps will be operated with another pump in that particular train. The pumps will be operationally acceptable if the test discharge pressure (Po) meets or exceeds a quantity corresponding to a dP for the system at minimum river level with two (2) pump flow. Inability to meet these criteria will result

in corrective action as provided in paragraph 2.1.1.2. This alternate test will not be conducted coincidentally with the quarterly requirements of Table P-1 and paragraph 2.1.1.2.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for the River Water pumps P004-B, P005-B, P008-A, P009-A, and P010-A from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing methods and frequency is sufficient to determine any pump degradation. We conclude that calculating Pi, measuring Po with 2 parallel pumps, running pumps monthly for Po measurements to ensure pump degradation has not occurred, and measuring all parameters quarterly and bearing temperature yearly meets the intent of the Section XI testing requirements.

III. Valve Testing Program Evaluation

The IST program submitted by Alabama Power Company was examined to verify that all Class 1, 2, and 3 safety related valves were included in the program and that those valves are subjected to the periodic tests required by the ASME Code, Section XI, and the NRC positions and guidelines. Our review found that all Class 1, 2, and 3 safety related valves were included in the IST program and, except for those valves identified below for which specific relief from testing has been requested, the valve tests and frequency of testing comply with the code requirements and the NRC positions and guidelines listed in General Section A. Also, included in the General Section A are the NRC position and valve listings for the leak testing of valves that perform a pressure isolation function and a procedure for the licensee's use to incorporate these valves into the IST program. Each Alabama Power Company request for relief from testing valves, the code requirement for testing, Alabama Power Company basis for requesting relief, and the EG&G evaluation of that request is summarized (B through Q) below and grouped according to each specific system.

A. General Considerations

1. Testing of Valves which Perform Pressure Isolation Function

There are several safety systems connected to the reactor coolant pressure boundary that have design pressures that are below the reactor coolant system operating pressure. There are redundant isolation valves forming the interface between these high and low pressure systems to prevent the low pressure systems from being subjected to pressures which exceed their design limit. In this role, the valves are performing a pressure isolation function.

It is the NRC view that the redundant isolation provided by these valves regarding their pressure isolation is important. The NRC considers it necessary to provide assurance that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity For this reason the NRC believes that some method, such as pressure monitoring, radiography, ultrasonic testing, leak testing, etc. could be used to ensure that the condition of each valve is satisfactory to maintain this pressure isolation function.

In the event the leak testing is selected as the appropriate method for achieving this objective, EG&G believes that the following valves should be categorized as A or AC and leak tested in accordance with IWV-3420 of Section XI of the applicable edition of the ASME Code. These valves are:

8998A, B, & C
8973A, B, & C
8993A & B
8988A & B
8997A, B, & C
8995A, B, & C

We have discussed this matter and identified the valves listed above to the licensee. The licensee has agreed to consider testing each of these valves and to categorize these valves with the appropriate designation depending on the testing method selected. Whatever the licensee selects as the testing method to be used to determine each valve's condition, the licensee will provide to the NRC for evaluation on a valve-by-valve basis the details of the method used that clearly demonstrates the condition of each valve.

2. ASME Code Section XI Requirements

Subsection IWV-3410(a) of the Section XI Code (which discusses full stroke and partial stroke) requires that Code Category A and B valves be exercised once every three months, with the exceptions as defined in IWV-3410(b-1), (e), and (f). IWV-3520(a) requires that Code Category C valves be exercised once every three months, with the exceptions as defined in IWV-3520(b). IWV-3700 requires no regular testing for Code Category E valves. Operational checks, with appropriate record entries, shall record the position of these valves before operations are performed and after operations are completed and shall verify that each valve is locked, or sealed. The limiting value of full stroke time for each power operated valve shall be identified by the owner and tested in accordance with IWV-3410(c). In the above exceptions, the code permits the valves to be tested at cold shutdown where:

a. It is not practical to exercise the valves to the position required to fulfill their function or to the partial position during power operation.

b. It is not practical to observe the operation of the valves (with fail-safe actuators) upon loss of actuator power.

The staff stated its position to the licensee that check valves whose safety function is to open are expected to be full stroked. If only limited operation is possible (and it has been demonstrated by the licensee and agreed to by the staff), the check valve shall be partial stroked. Since disc position is not always observable, the NRC staff stated

that verification of the plant's safety analysis design flow rate through the check valve would be an adequate demonstration of the full stroke requirement. Any flow rate less than design will be considered part-stroke exercising unless it can be shown that the check valve's disc position at the lower flow rate would be equivalent to or greater than the design flow rate through the valve. The licensee agreed to conduct his flow tests to satisfy the above position.

The licensee has stated that none of the Category A or B power operated valves can be part-stroked because of the design logic of the operating circuits. These circuits are such that when an open or close signal is received the valve must complete a full stroke before the relay is released to allow the valve to stroke in the other direction. We find that the above relief request from part-stroking is warranted and should be granted because the required function of the valves involves only full open or full closed positions.

3. Cold Shutdown Testing

a. Inservice valve testing at cold shutdown is defined as: Valve testing should commence not later than 48 hours after shutdown and continue until complete or plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdwn should be performed during the subsequent cold shutdowns to meet the code required testing frequency. We find the licensee's proposed cold shutdown condition testing acceptable.

3. The Code states that, in the case of cold shutdowns, valve testing need not be performed more often than once every three months for Category A and B valves and once every nine months for Category C valves. It is the NRC position that the code is inconsistent and that Category C valves should be tested on the same schedule as Category A and B valves. The licensee has agreed to modify any procedures as necessary on cold shutdown, to read, "In the case of frequent cold shutdowns, valve testing need not be performed more often than once every three (3) months for Category A, B, and C valves."

4. Changes to the Technical Specifications

In a November 1976 letter to the licensee, the NRC provided an attachment entitled "NRC Guidelines for Excluding Exercising (Cycling) Tests of Certain Valves During Plant Operation." The attachment stated that when one train of a redundant system such as in the Emergency Core Cooling System (ECCS) is inoperable, nonredundant valves in the remaining train should not be cycled since their failure would cause a loss of total system function. For example, during power operaton in some plants, there are stated minimum requirements for systems which allow certain limiting conditions for operation to exist at any one time and if the system is not restored to meet the requirements within the time period specified in a plant's Technical Specifications (T.S.), the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For such plants this situation could be contrary to the NRC guideline as stated in the document mentioned above.

The licensee has agreed to review the plant's T.S. and to consider the need to propose T.S. changes which would have the effect of precluding such testing.

After making this review, if the licensee determines that the T.S. should be changed because the guidelines are applicable, the licensee will submit to the NRC, in conjunction with the proposed T.S. change, the inoperable condition for each system that is affected which demonstrates that the valve's failure would cause a loss of system function or if the licensee determines that the T.S. should not be changed because the guidelines are not applicable or cannot be followed, the licensee will submit the reasons that led to their determination for each potentially affected section of the T.S.

5. Safety Related Valves

This review was limited to safety-related valves. Safety-related valves are defined as those valves that are needed to mitigate the consequences of an accident and/or to shut down the reactor and to maintain the reactor in a shutdown condition. Valves in this category would typically include certain ASME Code Class 1, 2 and 3 valves and could include some non-code Class valves.

It should be noted that the licensee may have included non-safety related valves in their Inservice Test Program as a decision on the licensee's part to expand the scope of their program.

6. For those valves that are impractical to test quarterly, the licensee has proposed to test them at cold shutdowns or refueling outages. In NRC and EG&G discussions with the licensee (September 26 and 27, 1979) the licensee has agreed to change this position to test at cold shutdowns and refueling. The licensee has also agreed to change their definition "C/R" to cold shutdown and refueling instead of the proposed cold shutdown or refueling. Valve testing exceptions to the above stated position are specifically addressed in this SER.

B. Reactor Coolant

1. Category A and A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A valves V026A & B, pressurizer pressure transmitter to dead weight pressure generator isolations, in accordance with the requirements of Seciton XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full or partial stroke) during normal operation or cold shutdown provides no assurance of an increase in safety. These valves are containment isolation valves which are normally closed and passive.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valves V026A & B from the requirements of Section XI. These valves are in their safety related position and are not required to open or close to mitigate the consequences of an accident or safely shut down the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function which they perform. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

b. Relief Request

The licensee has requested specific relief from exercising Category A/C valves, V038 reactor make-up water to pressurizer relief tank check, and V054 charging pump relief valve line check, in accordance with the requirements of Section XI and proposed to verify valve closure during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, either directly or indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate

test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valves V038 and V054 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (their safety related position) is during leak testing. These valves are not equiped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

C. Residual Heat Removal/Low Head Safety Injection

1. Category A and A/C Valves

a. Relief Request

The ~~licensee~~ has requested specific relief from performing leak rate testing and valve position indicator checks for Category A valves V025A & B, RHR pump (LHSI) suctions from containment sump, in accordance with the requirements of Section XI and proposed to leak test these valves by applying a pressure between the primary and secondary isolations.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

These valves provide primary isolation for containment sump penetrations with no provisions for leak rate testing with the differential pressure in the same direction as applied when the valves are performing their function as required by IWV-3420(c).

Leak rate testing will be performed by applying the differential pressure between the primary and secondary isolation valves.

Remote position indicators will be used to verify valve position per IWV-3300. However, visual observation of valve operation is not practical. Such observation would require removal of the valve protective chamber which is also considered to be a portion of the containment pressure boundary. Since the valve is provided with redundant indicators, position is accurately reflected by the remote indications.

The leak rate test during each refueling outage will verify that the remote position indicators accurately reflect the closed position of the valves. No practical means exist to verify the open position of the valves. However, following each leak-rate test the air pressure will be relieved by opening these valves, thus verifying that the disk moves away from the seat.

Evaluation

We agree with the licensee's basis and therefore feel relief should be granted for Category A valves V025A and B from the leak testing requirements of Section XI. The licensee has demonstrated that with the present piping configurations these valves can only be leak tested by applying a pressure between the valves. We conclude that this method of leak testing should verify the leak tight integrity of these valves. However, we do not agree with the licensee's basis for not checking valve position indicators in accordance with the requirements of Section XI. These valves have a dual safety function, to be full open and permit LHSI pump recirculation and to shut for containment isolation. We conclude that the valve position indicators must be checked to verify these valves are fully open and fully shut and that the proposed test method does not verify this.

b. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V021A, B, and C, RHR pump discharge to cold leg safety injection checks, in accordance with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 requires flow verification under LHSI into each RCS loop. These valves cannot be exercised during power operation because the LHSI/RHR pumps cannot overcome RCS pressure. During cold shutdown, these valves cannot be full stroke exercised because design flow cannot be verified through the valve unless all intitial test conditions can be met (i.e., suction from RWST through both pumps to the RCS with the RCS at atmospheric pressure).

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valves V02A, B and C from the exercising requirements of Section XI. The licensee has demonstrated that RHR/LHSI pump discharge pressure cannot overcome RCS operating pressure to establish flow and exercise these valves. Also during cold shutdown, specific initial conditions must be met to permit full flow/full stroke exercising. The vessel head must be removed, to place the RCS at atmospheric pressure and provide an adequate expansion volume to accomodate full LHSI flow. We conclude that the proposed alternate testing frequency of full stroke exercising the valves during refueling outages should verify proper valve operability.

c. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V051A, B, and C, boron

injection to RCS cold leg checks, in accordance with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 requires flow verification under HHSI or LHSI into each RCS loop. This flow verification cannot be accomplished during normal operation or cold shutdown. During normal operation with the Reactor Coolant System at operating pressure, these valves cannot be full stroke exercised because the HHSI pumps cannot provide design flow and the LHSI pumps cannot provide any flow. During normal operation, partial-stroke exercising these valves with the HHSI pumps would induce undesired thermal shock to the safety injection nozzles.

During cold shutdown, design flow (full stroke exercising) cannot be verified because the Reactor Coolant System is pressurized.

The valve will be verified as operable by comparing HHSI flow through the BIT to the sum of the established individual reactor loop injection flows. The valve test will coincide with the testing of the HHSI system via the BIT at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A/C valves V051A, B, & C from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised during power operation because the LHSI cannot overcome RCS pressure and partial stroking with the HHSI would result in thermal shock and damage to the injection nozzles. These valves cannot be exercised during cold shutdowns because the flow required for full stroke exercising could result in a low temperature overpressurization of the RCS. During refueling outages with the vessel head removed to provide an adequate expansion volume and with the RCS at atmospheric pressure full design flow/full stroke exercising can be accomplished. We conclude that the proposed alternate testing frequency to full stroke exercise the valves during refueling outages should demonstrate proper valve operability.

2. Category B Valves

a. Relief Request

The licensee has requested specific relief from stroke timing Category B valves V032A and B, residual heat exchanger tube side discharges, and V033A and B, residual heat exchanger bypasses, in accordance with the requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The measurement of stroke time for these flow control valves provides no increase in the level of safety for this system. The valves have no active function when the system is aligned for the LHSI function. The operability testing of these valves every 3 months will verify that the valves will operate from a closed to an open position.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category B valves V032A and B, and V033A and B from the stroke timing requirements of Section XI. The licensee has demonstrated that the only time these valves are required to function as modulating valves is during RHR operation. The above function is tested quarterly. Once the system is aligned for the LHSI flow path, these valves become passive and are not required to change position to perform their safety function. We conclude that the operability of these valves is inconsequential with regard to the safety functon they perform and that stroke time measurements for passive valves is meaningless.

3. Category C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category C valves V042A and B, RHR pump discharge to cold leg injection checks, in accordance

with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 requires flow verification under LHSI into each RCS loop. These valves cannot be exercised during power operation because the LHSI/RHR pumps cannot overcome RCS pressure. During cold shutdown, these valves cannot be full stroke exercised because design flow cannot be verified through the valve unless all initial test conditions can be met (i.e., suction from RWST through both pumps to the RCS with the RCS at atmospheric pressure).

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category C valves V042A and B from the exercising requirements of Section XI. The licensee has demonstrated that RHR/LHSI pump discharge pressure cannot overcome RCS operating pressure to establish flow and exercise these valves. Also during cold shutdown, specific initial conditions must be met to permit full flow/full stroke exercising. The vessel head must be removed to place the RCS at atmospheric pressure and provide an adequate expansion volume to accomodate full LHSI flow. We

conclude that the proposed alternate testing frequency of full stroke exercising these valves during refueling outages should verify proper valve operability.

C. Containment Spray

1. Category A Valves

a. Relief Request

The licensee has requested specific relief from performing leak rate testing and valve position indicator checks for Category A valves, 1003 A and B ~~1003A and B~~ containment spray pump suctions from the containment sump, in accordance with the requirements of Section XI and proposed to leak test these valves by applying a pressure between the primary and secondary isolations.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

These valves provide primary isolation for containment sump penetrations with no provisions for leak rate testing with the differential pressure in the same direction as applied when the valves are performing their function as required by IWV-3420(c). Leak rate testing will be performed by applying the differential pressure between the primary and secondary isolation valves.

Remote position indicators will be used to verify valve position per IWV-3300. However, visual observation of valve operation is not practical. Such observation would require removal of the valve protective chamber which is also considered to be a portion of the containment pressure boundary. Since the valve is provided with redundant indicators, position is accurately reflected by the remote indications. The leak rate test during each refueling outage will verify that the remote position indicators accurately reflect the closed position of the valves. No practical means exist to verify the open position of the valves. However, following each leak-rate test the air pressure will be relieved by opening these valves, thus verifying that the disk moves away from the seat.

Evaluation

We agree with the licensee's basis and therefore feel relief should be granted for Category A valves V003 A & B ~~V003A and B~~ from the leak testing requirements of Section XI. The licensee has demonstrated that with the present piping configurations these valves can only be leak tested by applying a pressure between the valves. We conclude that this method of leak testing should verify the leak tight integrity of these valves. However, we do not agree with the licensee's basis for not checking valve position indicators in accordance with the requirements of Section XI. These valves have a dual safety function, to be full open and permit LHSI pump recirculation and to shut for containment isolation. We conclude that the valve position indicators must be checked to verify these valves are fully open and fully shut and that the proposed test method does not verify this.

1. Category C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category C valves V007A and B, containment spray additive to eductor checks, in accordance with the requirements of Section XI and proposed to manually full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, exercising these valves with flow would introduce sodium hydroxide into the RWST (ECCS water supply). During cold shutdown, both trains of the system would have to be made inoperable in order to drain the system for bonnet removal and manual exercising of the valve disk. The valves will be verified as operable by removing the bonnet and manually full stroke exercising the disk at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category C valves V007A and B from the exercising requirements of

Section XI. The licensee has demonstrated that exercising these valves during power operation would contaminate the RWST/ECCS water supply with sodium hydroxide resulting in corrosion of the ECCS systems. Draining of the system to manually exercise these valves would render the system inoperable. During cold shutdown, draining the system to perform valve testing could result in a delay of reactor startup. We conclude that with the present plant design, manual exercising is the only available method to full stroke exercise these valves without system contamination or rendering the system inoperable. Also, we conclude that the proposed alternate test method and frequency should demonstrate proper valve operability.

b. Relief Request

The licensee has requested specific relief from exercising Category C valves V002A and B, containment spray pump discharge checks, in accordance with the requirements of Section XI and proposed to manually full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of these normally closed check valves per IWV-3520 during power operation or cold shutdown is not practical. During power operation, the CMTC is not available. During cold shutdown, valve

disassembly or an air test for flow verification requires draining a portion of the system. The valves will be verified as operable by removing the bonnet and manually full stroke exercising the disk at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category C valves V002A and B from the exercising requirements of Section XI. The licensee has demonstrated that exercising these valves by establishing flow through the system would result in spraying down the containment resulting in equipment damage. Also, we conclude that the only other available methods of exercising are by valve disassembly and manual disc exercising or by using air to move the disc. These tests require containment entry and partial system draining which is not possible during power operation and could result in a delay of reactor startup during cold shutdown. We conclude that the proposed alternate test method and frequency to disassemble these valves and manually full stroke exercise during refueling should demonstrate proper valve operability.

c. Relief Request

The licensee has requested specific relief from exercising Category C valve V014, containment spray suction from the RWST, in accordance with the requirements of Section XI and proposed to partial stroke exercise this valve quarterly.

Code Requirement

Refer to valve testing paragraph 4.2.

Licensee's Basis for Requesting Relief

The operability testing (full stroke) of this normally closed check valve per IWV-3520 during plant operation, cold shutdown, or refueling is not practical. The only means of full stroking the valve is by initiating the Containment Spray System which would cause excessive damage to equipment in CTMT. Manually exercising the valve would require removing the valve bonnet after draining the RWST. This action would put the plant in an unsafe condition. The valve will be verified as operable during the quarterly testing of the Containment Spray Pumps. Due to system design, the valve can only be partial stroke tested.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category C valve V014 from the exercising requirements of Section XI during power operation and cold shutdown. The licensee has demonstrated that exercising this valve during power operation or cold shutdown would result in spraying down the containment and thus would cause excessive damage to electrical equipment inside the containment. We conclude that with the present piping design only partial stroke exercising during the quarterly pump test can be accomplished. However, we recommend that the utility further investigate a method to full stroke exercise this valve during each refueling outage.

E. Containment Isolation System

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valve V001, containment air sample check, in accordance with the requirements of Section XI and proposed to verify valve closure during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, either directly or indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valve V001 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (its

safety related position) is leak testing. These valves are not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

F. High Head Safety Injection/Chemical and Volume Control

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valve VC52, SIS accumulator tanks fill line, in accordance with the requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

This valve is a passive containment isolation valve whose safety function is to remain closed. Valve leak rate tests shall be conducted each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valve VC52 from the requirements of Section XI. This valve is in its

safety related position and is not required to open or close to mitigate the consequences of an accident or safely shut down the plant. Therefore, the operability of this valve is inconsequential with regard to the safety function which it performs. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

b. Relief Request

The licensee has requested specific relief from exercising Category A/C valves, V058 nitrogen supply to accumulators, V115 A, B, and C CVCS seal injections to RCP's, V119 CVCS charging pump discharge to regen heat exchanger, and V213 seal water from RCP's, in accordance with the requirements of Section XI and proposed to verify valve closure during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, either directly or indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valves V058, V115 A, B, and C, V119, and V213 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (their safety related position) is leak testing. These valves are not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

c. Relief Request

The licensee has requested specific relief from exercising category A/C valves V062 A, B, and C, SIS boron injection to RCS cold legs in accordance with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 requires flow verification under HHSI into each RCS loop. This flow verification cannot

be accomplished during normal operation or cold shutdown. During normal operation, full or partial stroking would cause a perturbation of the RCS, possibly causing a plant shutdown. During cold shutdown, stroking the valve would cause overpressurization of the RCS. The valve will be verified as operable by initiation of HHSI through the BIT to the RCS during each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for category A/C valves V062 A, B, and C from the exercising requirements of Section XI. The licensee has demonstrated exercising these valves during power operation would inject highly borated water into the RCS causing power transients that could result in a reactor shutdown. Also, during cold shutdown injecting high head safety injection flow could result in a low temperature over-pressurization of the RCS. We conclude that full stroke exercising can only be accomplished during refueling outages with the vessel head removed providing an adequate expansion volume while the RCS is at atmospheric pressure.

d. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V076 A and B, residual heat exchanger to SI to RCS hot legs, in accordance with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, these valves cannot be full or partial stroked because the RHR/LHSI pumps cannot overcome RCS pressure. During cold shutdown, these valves cannot be fully or partially stroked without bypassing the core during RHR and defeating the RHR cooling function. The valves will be full-stroke tested at each refueling outage when RHR/LHSI design flow is used to fill the reactor cavity.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category A/C valves V076 A and B from the exercising requirements of Section XI. The licensee has demonstrated that exercising these valves during power operation cannot be accomplished because RHR/LHSI cannot overcome RCS operating pressure. Also, during cold shutdown, exercising these valves would result in the diversion of RHR flow, thus bypassing the core resulting in a loss of the RHR cooling function. We conclude that full stroke exercising these valves during refueling outages when RHR/LHSI flow is used to fill the refueling cavity should demonstrate proper valve operability.

e. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V077 A, B, and C, HHSI/LHSI/RHR to RCS hot legs-1-and-2, in accordance with the requirements of Section XI and proposed to full stroke exercise the valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, these valves cannot be full stroked because the HHSI pumps cannot provide design flow and the LHSI pumps cannot provide any flow. Partial stroking the valves with the HHSI pumps at power would induce thermal shock to the safety injection nozzles. During cold shutdown, full or partial stroking with the HHSI pumps could overpressurize the RCS. The valves will be full stroked by initiation of LHSI while filling the cavity during each refueling outage. Establishment of LHSI/ECCS design flow through the hot leg injection path will verify that the valves have sufficiently opened to perform their function.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category A/C valves V077 A, B, and C from the exercising requirements of Section XI. The licensee has demonstrated that exercising these valves during power operation with HHSI flow would result in thermal shock to the injection nozzles causing damage. Also, during power operation LHSI/RHR cannot overcome RCS operating pressure to exercise these valves. During cold shutdown, exercising these valves using HHSI flow could result in a low temperature overpressurization of the RCS. We conclude that full stroke exercising these valves while filling the refueling cavity with the vessel head removed providing an expansion volume and the RCS at atmospheric pressure should verify proper valve operability.

2. Category B Valves

a. Relief Request

The licensee has requested specific relief from exercising Category B valve V254, CVCS BA filter to the charging pump suction, in accordance with the requirements of Section XI and proposed to full stroke exercise this valve during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of this valve during normal operation or cold shutdown would require that the boric acid system be made inoperable, thus placing the plant in an unsafe condition. The valve will be full stroke tested for operability at each refueling outage.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category B valve V264 from the exercising requirements of Section XI. The licensee has demonstrated that if this valve failed while exercising, the boric acid system would be made inoperable. The boric acid system is required to be in continuous operation during power operation and cold shutdown. We conclude that exercising this valve during refueling outages when the system can be removed from service should verify proper valve operability.

3. Category C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category C valves V066 A, B, and C, HHSI pump discharge to RCS cold legs, and V078 A, B, and C and V079 A, B, and C, HHSI pump discharge to RCS hot legs, and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, these valves cannot be full stroke exercised because the HHSI pumps cannot achieve design flow against RCS pressure. Partially stroking the valves at power would induce thermal shock to the safety injection nozzles. During cold shutdown, full stroking would overpressurize the RCS. The valves will be verified as operable by comparing HHSI flow to the sum of the established individual reactor loop injection flows. The valve test will coincide with the testing of the HHSI system during each refueling outage.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category C valves V066 A, B, and C, V078 A, B, and C, and V079 A, B, and C from the exercising requirements of Section XI. The licensee has demonstrated that exercising these valves during power operation would result in thermal shocking of the injection nozzles causing nozzle damage. Also, during cold shutdown, exercising these valves with HHSI flow could result in a low temperature overpressurization of the RCS. We conclude that full stroke exercising these valves during refueling outages with the vessel head removed providing an adequate

expansion volume to prevent low temperature over-pressurization and the RCS at atmospheric pressure should verify proper valve operability.

b. Relief Request

The licensee has requested specific relief from exercising Category C valve V026 HHSI suction from the RWST in accordance with the requirements of Section XI and proposed to full stroke exercise this valve during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of this normally closed check valve per IWV-3520 requires flow verification under HHSI into each RCS loop. This flow verification cannot be accomplished during normal operation or cold shutdown. During normal operation, full or partial stroking would cause overboration of the RCS, possibly causing a plant shutdown. During cold shutdown, stroking the valve would cause overpressurization of the RCS. The valve will be verified as operable by initiation of HHSI through the BIT to the RCS during each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category C valve V026

from the exercising requirements of Section XI. The licensee has demonstrated exercising this valve during power operation would inject highly borated water into the RCS causing power transients that could result in a reactor shutdown. Also, during cold shutdown injecting high head safety injection flow could result in a low temperature over-pressurization of the RCS. We conclude that full stroke exercising can only be accomplished during refueling outages with the vessel head removed providing an adequate expansion volume while the RCS is at atmospheric pressure.

c. Relief Request

The licensee has requested specific relief from exercising Category C valves V032 A, B, and C, accumulator discharge to RCS cold legs, in accordance with the requirements of Section XI and proposed to partial stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, these valves cannot be full- or partial-stroke exercised because the accumulators cannot overcome RCS pressure. During cold shutdown, these valves cannot be fully or partially stroked without overpressurizing the

RCS. During refueling outages, these valves cannot be full-stroke exercised at accumulator operating pressure without causing internal core damage due to excessive flow rates. Disassembly of the valves during refueling outages requires the draining of the accumualtors and associated piping. The valves will be partial-stroke exercised at each refueling outage by discharging the accumulators into the RCS with the accumulators at atmospheric pressure. The valves will be verified as closed prior to the exercising by testing for leakage with a differential pressure $\geq$100 psi across the valves. A decrease in accumulator level when the system is discharged to the RCS will verify a partial stroke.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category C valves V032 A, B, and C from the exercising requirements of Section XI during power operation and cold shutdown. The licensee has demonstrated that during power operation these valves cannot be exercised because accumulator pressure cannot overcome RCS operating pressure. During cold shutdown exercising these valves with accumulator flow could result in a low temperature over-pressurization of the RCS. We also agree that full stroke exercising these valves with accumulator flow during refueling outages with the vessel head removed to provide an adequate expansion volume could result in internal core damage because of the excessive flow rates. We conclude that with the present piping configurations, only partial stroke exercising of these valves is possible. However, we recommend that the

utility further investigate a method to full stroke exercise these valves (i.e. manual exercising during refueling outages).

c. Relief Request

The licensee has requested specific relief from exercising Category C valves V037 A, B, and C, accumulator discharge to RCS cold legs, in accordance with the requirements of Section XI and proposed to partial stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing of these normally closed check valves per IWV-3520 during normal operation or cold shutdown is not practical. During normal operation, these valves cannot be full-stroke exercised because the accumulators cannot overcome RCS pressure. The valves cannot be partial-stroke exercised during normal operation without making the accumulators inoperable, thus placing the plant in an unsafe condition. During cold shutdown, these valves cannot be fully or partially stroked without overpressurizing the RCS. During refueling outages, these valves cannot be full-stroke exercised at accumulator operating pressure without causing internal core damage due to excessive flow rates. Disassembly of the valves during refueling outages requires the draining of the accumulators and

associated piping. The valves will be partial-stroke exercised at each refueling outage by discharging the accumulators into the RCS with the accumulators at atmospheric pressure. The valves will be verified as closed prior to the exercising by testing for leakage with a differential pressure $\geq$100 psi across the valves. A decrease in accumulator level when the system is discharged to the RCS will verify a partial stroke.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category C valves V032 A, B, and C from the exercising requirements of Section XI during power operation and cold shutdown. The licensee has demonstrated that during power operation these valves cannot be exercised because accumulator pressure cannot overcome RCS operating pressure and the accumulators cannot be removed from service. During cold shutdown exercising these valves with accumulator flow could result in a low temperature overpressurization of the RCS and the accumulators are isolated, which prevents partial stroking through the test line. We also agree that full stroke exercising these valves with accumulator flow during refueling outages with the vessel head removed to provide an adequate expansion volume could result in internal core damage because of the excessive flow rates. We conclude that with the present piping configurations, only partial stroke exercising of these valves is possible. However, we recommend that the utility further investigate a method to full stroke exercise these valves (i.e., manual exercising during refueling outages).

e. Relief Request

The licensee has requested specific relief from exercising Category C valve V210, CVCS BA filter to charging pump suction, from the exercising requirements of Section XI and proposed to full stroke exercise this valve during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Operability testing of this normally closed check valve per IWV-3520 during normal operation or cold shutdown would require that the boric acid system be made inoperable, thus placing the plant in an unsafe condition. The valve will be full-stroke tested at each refueling outage. A flow or differential pressure greater than or equal to the manufacturer's minimum full-open values (Flow $\geq$ 10 GPM, dP $\geq$ 5 psig) will be verified.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category C valve V210 from the exercising requirements of Section XI. The licensee has demonstrated that exercising this valve requires isolation of the boric acid system. The boric acid system is required to be inservice at all times during power operation and cold shutdown. We conclude that full stroke exercising this valve during refueling outages when the boric acid system can be removed from service should verify proper valve operability.

3. Post Accident Containment Venting and Sampling

1. Category B Valves

a. Relief Request

The licensee has requested specific relief from exercising Category B valve V021, CTMT pressurization line, in accordance with the requirements of Section XI and proposed to full stroke exercise this valve during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full stroke) of this valve during normal operation or cold shutdown could cause a loss of system function. During normal operation, opening the valve dumps all instrument air into the CTMT atmosphere causing a loss of RCS pressure control for spray and a loss of letdown control. During cold shutdown, exercising the valve would cause loss of pressure control and level control. Valve design does not facilitate a partial-stroke test.

The valve will be full stroke tested for operability at each refueling outage.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category B valve V021 from the exercising requirements of Section XI. The licensee has demonstrated that exercising this valve during power operation would cause a loss of spray for RCS pressure control and a loss of letdown and pressurizer level control which could result in a reactor trip. Also, exercising this valve during cold shutdown would cause a loss of RCS pressure and level control which could result in a RCS low temperature overpressurization. We conclude that full stroke exercising this valve during refueling outages with the vessel head removed and the RCS at atmospheric pressure should demonstrate proper valve operability.

H. Liquid Waste Disposal

1. Category A and A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A valve V005, reactor coolant drain tank control valve, in accordance with the requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full or partial stroke) during normal operation or cold shutdown of these valves provides no assurance of an increase in safety. The valve is a containment isolation valve which is normally closed and passive. The valve's closed position will be verified during the performance of the leak-rate tests at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valve V005 from the requirements of Section XI. This valve is in its safety related position and is not required to open or close to mitigate the consequences of an accident or safely shutdown the plant. Therefore, the operability of this valve is inconsequential with regard to the safety function which it performs. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

b. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V204, containment sump recirc, and V291, containment sump pump discharge in accordance with the requirements of Section XI and proposed to verify valve closure (their safety related position) during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, neither directly nor indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valves V204 and V291 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (their safety related position) is leak testing. These valves are not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

I. Spent Fuel Pool Cooling and Clean-up

1. Category A and A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A valve V012, spent fuel pool clean-up loop isolation, in accordance with the requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full or partial stroke) during normal operation or cold shutdown of this valve provides no assurance of an increase in safety. The valve is a containment isolation valve which is normally closed and passive. The valve's closed position will be verified during the performance of the leak-rate tests at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valve V012 from the requirements of Section XI. This valve is in its safety related position and is not required to open or close to mitigate the consequences of an accident or safely shut down the plant. Therefore, the operability of this valve is inconsequential with regard to the safety function which it performs. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

b. Relief Request

The licensee has requested specific relief from exercising Category A/C valve V013, spent fuel pool cooling clean-up loop check, in accordance with the requirements of Section XI and proposed to verify valve closure (its safety related position) each refueling outage.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, either directly or indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valve V013 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (its safety related position) is leak testing. This valve is not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

J. Auxiliary Feedwater

1. Category B Valves

3. Relief Request

The licensee has requested specific relief from exercising Category B valves V013 A and B, and V014 A, B, and C, service water to auxiliary feedwater pump suction, in accordance with the requirements of Section XI and proposed to full stroke exercise these valves during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

It is not practical to exercise these valves during normal plant operation or at cold shutdown per IWV-3410. The exercising of these valves would introduce chlorides and fluorides into the Steam Generators, jeopardizing the secondary water chemistry which would result in Steam Generator mechanical damage. These valves will be exercised at reactor refueling outages.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for Category B valves V013 A and B and V014 A, B, and C from the exercising requirements of Section XI. The licensee has demonstrated that exercising these valves during power operaton or cold shutdown could introduce service water into the AFW suction piping resulting in the introduction of chlorides and fluorides into the steam

generators. Thus, secondary water chemistry would be out of specification and steam generator mechanical stress damage could occur. We conclude that exercising these valves during refueling outages when the AFW suction piping can be isolated and flushed prior to its return to service should demonstrate proper valve operability.

K. Service Water

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valve V075, service water to RCP motor coolers, in accordance with the requirements of Section XI and proposed to verify valve closure (its safety related position) during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, neither directly nor indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specification.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valve V075 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (its safety related position) is leak testing. This valve is not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

L. Condensate and Demineralized Water Transfer and Storage

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valve V002, demineralized water to reactor vessel head storage, in accordance with the requirements of Section XI and proposed to verify valve closure (its safety related position) each refueling outage.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, neither directly nor indirectly, the operability of this normally open check valve per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valve V002 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (its safety related position) is leak testing. This valve is not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

M. Component Cooling

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valves V189, CCW supply to

excess letdown heat exchanger, and V083, CCW supply to RCPs, in accordance with the requirements of Section XI and proposed to verify valve closure (their safety related position) during refueling outages.

Code Requirements

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, neither directly nor indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for Category A/C valves V083 and V159 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (their safety related position) is leak testing. These valves are not equiped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

N. Service Air System

1. Category A Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A valves V001 and 002, service air to pipe penetration room and containment, from the exercising requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full or partial stroke) during normal operation or cold shutdown of these valves provides no assurance of an increase in safety. The valves are containment isolation valves which are normally closed and passive. The valves' closed position will be verified during the performance of the leak rate tests at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valves V001 and 002 from the requirements of Section XI. These valves are in their safety related position and are not required to open or close to mitigate the consequences of an accident or safely shutdown the plant. Therefore, the operability of these valves is

inconsequential with regard to the safety function which they perform. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

C. Instrument Air

1. Category A/C Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A/C valve V002, containment instrument air supply, in accordance with the requirements of Section XI and proposed to verify valve closure (its safety related position) during refueling outages.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

Due to plant design it is not practical to verify by any positive means, either directly or indirectly, the operability of these normally open check valves per the requirements of IWV-3520. Valve closure will be verified during the performance of the valve leak-rate test which shall be conducted at the same frequency as reactor refueling outages per the plant Technical Specifications.

Evaluation

We agree with the licensee's basis, and therefore feel that relief should be granted for category A/C valve V002 from the exercising requirements of Section XI. The licensee has demonstrated that due to plant design the only method available to verify valve closure (its safety related position) is leak testing. This valve is not equipped with valve position indicators and test connections are located inside the containment. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

P. Containment Cooling and Purge

1. Category A Valves

a. Relief Request

The licensee has requested specific relief from exercising Category A valves V002A and B, containment leak rate test, in accordance with the requirements of Section XI.

Code Requirement

Refer to valve testing paragraph A.2.

Licensee's Basis for Requesting Relief

The operability testing (full or partial stroke) during normal operation or cold shutdown of these valves

provides no assurance of an increase in safety. The valves are containment isolation valves which are normally closed and passive. The valves' closed position will be verified during the performance of the leak rate tests at each refueling outage.

Evaluation

We agree with the licensee's basis, and therefore feel relief should be granted for Category A valves V002A and B from the requirements of Section XI. These valves are in their safety related position and are not required to open or close to mitigate the consequences of an accident or safely shutdown the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function for which they perform. We conclude that the quarterly stroke and stroke time measurements are meaningless for passive valves.

Q. Miscellaneous

1. Valves Exercised During Cold Shutdowns and Refuelings

a. Relief Request

The licensee has requested specific relief for all valves that require stroke timing, that can only be exercised during cold shutdowns or refueling outages from the exercising requirements of Section XI and proposed to test these valves once each cold shutdown, not to exceed once each month, if this testing frequency is required by IWV-3410(c).

Code Requirement

IWV-3410(c) states that if an increase in stroke time of 25% or more from the previous test for valves with stroke times greater than ten seconds or 50% or more for valves with stroke times less than or equal to ten seconds is observed, test frequency shall be increased to once each month until corrective action is taken.

Licensee's Basis for Requesting Relief

Valves that are normally tested during cold shutdown or refueling cannot be tested once each month. Stroking these valves during power operation may place the plant in an unsafe condition. The test frequency shall be increased to once each cold shutdown, not to exceed once each month.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for all valves that require stroke timing that can only be exercised during cold shutdowns and refueling outages from the exercising requirements of IQWV-3410(c). The licensee has provided the specific technical basis why each of these valves cannot be exercised during power operation. We conclude that the proposed alternate testing frequency to exercise valves once each cold shutdown, not to exceed once each month, if required by IWV-3410(c), meets the intent of Section XI.

b. - Relief Request

The licensee has requested specific relief for all valves that can only be exercised during cold shutdowns or refueling outages from the requirements of Section XI, IWV-3410(g) and IWV-3520(c), and proposed to use plant Technical Specifications to determine the conditions for plant start-up.

Code Requirement

IWV-3410(g) and IWV-3520(c) state that when corrective action is required as a result of tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable operation shall be run following any required corrective action before the valve is returned to service.

Licensee's Basis for Requesting Relief

The plant Technical Specifications provide the requirements and plant conditions necessary for plant startup. The test requirement will be satisfied before the valve is required for plant operability as defined in the plant Technical Specifications.

Evaluation

We agree with the licensee's basis and therefore feel that relief should be granted for all valves, that can only be exercised during cold shutdowns and refueling outages, from the requirements of Section XI, IWV-3410(g) and IWV-3520(C). The Joseph M. Farley Technical Specifications have been previously reviewed

and approved by the NRC. We conclude that using plant Technical Specifications to establish limiting conditions of operations meets the intent of the requirements of Section XI and should assure system availability.

IV. Attachment 1

The following are Category A, B, and C valves that meet the 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 and are full stroke exercised during cold shutdowns and refueling outages. EG&G has reviewed all valves in this attachment and agrees with the licensee that testing these valves during power operation is not possible due to the valve type and location, system design, or because this action would place the plant in an unsafe condition. We feel these valves should not be exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

A. Residual Heat Removal/Low Head Safety Injection

1. Category A valves V001A and B, reactor coolant to RHR pumps and Category B valves V016A and B, RHR pump suctions cannot be exercised during power operation. These valves are interlocked shut when RCS pressure is greater than 402.5 psig to prevent overpressurizing the RHR system. Also, these valves are not designed for partial stroke exercising. These valves are full stroke exercised during cold shutdowns and refueling outages.

2. Category B valve V044, residual heat exchanger discharge to RCS hot leg, cannot always be exercised during power operation. The operability testing (full or partial stroke) of this valve during normal operation could subject the RHR system to pressure in excess of its design pressure (600 psig). It is assumed for the purpose of the cycling test that the upstream check valves have failed. Venting of the upstream pressure cannot be accomplished under any

conditions because of the radiation hazard to plant personnel. Once every three (3) months the upstream pressure will be measured. If the pressure is less than or equal to 550 psig, then the valve will be full stroke exercised. If the pressure is greater than 550 psig the valve not will be exercised that quarter. If the upstream pressure prohibits quarterly testing, the valve will be full stroked at cold shutdowns and refueling outages.

B. Containment Isolation System

1. Category A valves V002, HV3657, and HV3658, containment air samples, cannot be exercised during power operation. The operability testing (full stroke shutting) of these valves during normal operation could cause a loss of system function. A failure while cycling in a nonconservative position would cause a loss of the CTMT radiation monitoring system. The valve design does not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown and refueling outage. This system is required for accident mitigation.

2. Category A valves V003 and V004, containment differential pressure detector isolations, cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation could cause a loss of system function. A failure while cycling in a nonconservative position would cause a loss of the CTMT Pressure Instrument System. The valve design does not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown and refueling outage. The containment pressure instrument system is required for power operation and accident mitigation.

C. High Head Safety Injection/Chemical and Volume Control

1. Category B valves V015, boron injection recirculation to boron injection tank, and V056A and B, boron injection tank recirculation isolations, cannot be exercised during power operation. The operability testing (full stroke) of this valve during normal operation could cause a loss of system function. A failure while cycling in a nonconservative (closed) position would render the boron injection system inoperable. The volume of the BIT could not be assured. Valve design does not facilitate a partial-stroke test. The valves will be full stroke tested for operability at each cold shutdown.

2. Category B valves V063, HHSI to RCS cold legs, and V068 and V072, HHSI to RCS hot legs, cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation could put the plant in an unsafe condition. These normally closed valves provides back-up safety-injection into the RCS bypassing the BIT. Failure during cycling in a nonconservative position would jeopardize the normal safety injection function. The valve design does not facilitate a partial-stroke test. These valves will be full-stroke tested for operability at each cold shutdown.

3. Category A valves V249A and B seal water from RCPs, cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation could cause a loss of system function. The failure of these valves in a nonconservative position during a cycling test would cause the loss of the RCP seal water cooling function resulting in pump damage or forcing the RCP to be stopped resulting in a reactor trip. The design of the valve will not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown.

4. Category A valves V254, RC from regen heat exchanger, and V257 and 258, CVCS charging pump discharges to the regen heat exchanger, and Category B valves V376A and B, charging pump suctions from the VCT, cannot be exercised during power operation. Failure of these valves in an unconservative position while exercising would eliminate the VCT as a source of charging make up water which would result in a loss of pressurizer level control and could cause a reactor scram. The design of these valves does not facilitate partial stroke exercising. These valves will be full-stroke tested for operability at each cold shutdown.

D. Main Steam

1. Category B valves V001A-C and V002A-C, MSIV's cannot be full stroke exercised during power operation. Shutting these valves would result in a turbine trip and could result in a reactor trip. These valves are partial stroke exercised during power operation and full stroke exercised during cold shutdowns.

2. Category B valves V003A-F cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation is not possible. The bypass valves are interlocked with the MSIVs such that when the MSIVs are open, the bypass valves are closed. The design of the valves will not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown.

E. Condensate and Feedwater

1. Category B valves FCV 478, 488, and 498, main feedwater isolations, and FCV 479, 489, and 499, main feedwater bypass isolations, and category C valves V001A-C, main feedwater

checks, cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation would cause an interruption of feedwater to the Steam Generators and introduce unwarranted transients to the primary as well as the secondary systems that could result in a reactor trip. The design of the valves will not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown.

F. Auxiliary Feedwater

1. Category C valves V002A, B, C, E, and G, MDAFW discharge to S/Gs, and V011A, B, and C, auxiliary feedwater to S/Gs, cannot be exercised during power operation. The only positive means of exercising these normally closed valves is by directing AFW flow into the Steam Generators. The initiation of AFW during power operation will result in unnecessary thermal shock to the Auxiliary Feedwater-to-Main Feewater connection. An introduction of cold water into the secondary system will also cause power transients. AFW flow will be directed through the valves at the design flow rate of the AFW system at cold shutdown. Verification of this flow through the valves in conjunction with verification that the control valve position is the same for each test will provide assurance that the valves have opened sufficiently to perform their function.

2. Category C valves V002D, F, and H and V003, TDAFW discharge to S/G's, cannot be exercised during power operation. The only positive means of exercising (full or partial stroke) of these normally closed valves is by directing AFW flow into the Steam Generators. The initiation of AFW during power operation will result in unnecessary thermal shock to the Auxiliary Feedwater-to-Main Feedwater connection. An introduction of cold water into the secondary system will

also cause power transients. The operation of the Turbine Driven AFW pump during cold shutdown is not possible because Turbine Drive steam is not available. AFW flow will be directed through the valves at the design flow of the AFW system during a mode of operation approaching cold shutdown or leaving cold shutdown in which steam is available. Verification of this flow through the valves in conjunction with verification that the control valve position is the same for each test will provide assurance that the valves have opened sufficiently to perform their function.

3. Category C valves V007A and B, MDAFW pump suction checks, cannot be full stroke exercised during power operation. No instrumentation is provided for the determination of differential pressure across the valves. A partial-stroke test will be accomplished during the quarterly testing of the MDAFW pumps. Acceptance of the pump test will provide assurance that the valves have partially opened. A full-stroke test will be accomplished by providing MDAFW pump design flow to the Steam Generators during cold shutdown. Verification that design flow is reached provides assurance that the valves have opened in order to perform their function.

G. Service Water

1. Category A valves V071, service water to RCP motor coolers, and V072 and B1, service water return from RCP motor coolers cannot be exercised during power operation. The operability testing of these valves during normal operation could cause a loss of system function. The failure of one of these valves in a nonconservative (closed) position would cause overheating of the RCP motors and would require the shutdown of RC Pumps and of the Reactor. Valve design does not facilitate partial-stroke testing. These valves will be full-stroke tested for operability at each cold shutdown.

H. Component Cooling Water

1. Category A valves V082, CCW to RCP's, and V097 and 99, CCW from RCP's bearings, and HV3045 and 3184, CCW return from RCP's thermal barriers, cannot be exercised during power operation. The operability testing (full stroke) of these valves during normal operation would jeopardize the RCP cooling function. Cycling of the valves would interrupt the CCW supply to the reactor coolant pumps. Also the failure of the valves in a nonconservative position during the cycling test would result in a loss of the system function. This would require stopping RCPs to prevent overheating and damage resulting in a reactor shutdown. The design of the motor-operated valves will not facilitate a partial-stroke test. The valves will be full-stroke tested for operability at each cold shutdown.

I. Instrument Air

1. Category A valve HV3611, containment instrument air supply, cannot be exercised during power operation. The operability testing (full stroke) of this valve during normal operation would cause an interruption of instrument air supply to instruments and equipment associated with the RCS. Also, a failure in a nonconservative position during a cycling test would cause a complete loss of instrument air supply to the containment resulting in a loss of RCS control and could force a reactor shutdown. The design of the valve will not facilitate a partial-stroke test. The valve will be full-stroke tested for operability at each cold shutdown.

V. Attachment II

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

System	P&ID	Rev.
Post Accident Containment Combustible Gas	D-175019	9
Safety Injection	D-175038	
	(sheet 1)	12
	(sheet 2)	10
	(sheet 3)	6
Penetration and Filtration (HVAC)	D-175022	
Containment Cooling and Purge	D-175010	
	(sheet 1)	9
	(sheet 2)	5
Chemical and Volume Control	D-175039	
	(sheet 1)	8
	(sheet 2)	11
Service Water	D-17-119	
	(sheet 2)	
	(sheet 3)	
River Water	D-170119	
	(sheet 7)	
Waste Processing	D-175042	8
Containment Drains and Vents	D-175004	
	(sheet 1)	13
Spent Fuel Pool Cooling	D-175043	8
Main and Auxiliary Steam	D-175033	
	(Sheet 1)	11
	(sheet 2)	9

System	P&ID	Rev.
Main Feedwater	D-175073	6
Auxiliary Feedwater	D-175007	12
Demineralized Water	D-175047	12
Sampling	D-175009	
	(sheet 1)	13
	(sheet 2)	9
Component Cooling Water	D-175002	
	(sheet 1)	13
	(sheet 2)	11
Service Air	D-175035	5
Instrument Air	D-175034	
	(sheet 2)	0
	(sheet 3)	0
HVAC and Filter	D-205012	6
HVAC and Filter	D-175012	10
Reactor Coolant	D-175037	
	(sheet 2)	9
Residual Heat Removal	D-175041	9
Service Water	D-175003	
	(sheet 1)	9
	(sheet 2)	9

VI. Attachment III

A. Valves that are never full stroke exercised or that have a testing frequency greater than each refueling outage:

1. V014 containment spray suction from RWST

2. V032 A, B, and C accumulator discharge to RCS cold legs

B. Relief requests with insufficient technical basis where relief was not recommended:

1. Valve Testing Program

a. D.2.c
b. F.3.c
c. C.1.a
d. D.1.a