UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE THIRD TEN-YEAR INSERVICE TESTING PROGRAM

GEORGIA POWER COMPANY

EDWIN I. HATCH NUCLEAR PLANT UNITS 1 AND 2

DOCKET NUMBERS 50-321 AND 50-366

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1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements determined acceptable to the staff. Alternatives that conform with the guidance in GL 89-04 may be implemented without additional NRC approval, but are subject to review during inspections. Further guidance was given in Generic Letter 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

The Hatch Units 1 and 2 third ten-year interval program was submitted in a letter dated September 15, 1995. The third ten year interval for Unit 1 started on January 1, 1996 and ends on December 31, 2006. In accordance with the proposed alternative of Relief Request RR-G-2, the third ten-year interval for both Units 1 and 2 will begin on January 1, 1996. In addition, in accordance with the proposed alternative of Relief Request RR-G-1 which was approved in a letter dated August 29, 1995, the applicable Codes used in the Hatch IST program will be the American Society of Mechanical Engineers Operation and Maintenance (ASME OM) Code-1990 for pumps and valves, with the exception of relief valves. The applicable Code for relief valves will be ASME OM Code-1995.

The NRC staff's findings with respect to authorizing alternatives and granting or not granting the reliefs requested as part of the licensee's IST program are contained in this safety evaluation (SE). In addition, the staff has evaluated the deferred test justifications for valves which the licensee states cannot be tested in accordance with the Code during power operation or cold shutdowns. The staff has also reviewed the IST program scope for selected systems and technical positions taken by the licensee in their IST program. The licensee should address the anomalies identified in Section 7 within one year of the date of this SE or the next refueling outage, whichever is longer, unless otherwise noted. Relief requests determined to be required as a result of this review should be submitted for NRC evaluation prior to the next scheduled testing. Proposed alternatives cannot be implemented without prior NRC approval.

2.0 IST PROGRAM ISSUES

2.1 Refueling Outage Justification ROJ-V-2

The licensee has categorized the automatic depressurization (ADS) relief valves listed in Appendix B of this SE as Category BC. Therefore, these valves are considered in the Hatch IST program as power-operated valves. Refueling outage justification ROJ-V-2 defers stroke testing of the ADS valves in accordance with the exercise requirements of Paragraph ISTC 4.2.2. Based on the categorization of the valve, the staff agrees with the deferral of the stroke testing to refueling outages.

ROJ-V-2 also states that the power-operated stroke testing requirements of Paragraph ISTC 4.2.4 will be substituted with maintenance activities, pilot valve stroke testing, and complete valve exercising. Test methods employed by the licensee that are different from the Code require an approved relief request. Therefore, relief would be required from the requirements of Paragraph ISTC 4.2.4. Since the licensee provided sufficient information in their refueling outage justification to evaluate ROJ-V-2 as a relief request, an evaluation has been included below.

2.1.1 Licensee's Basis for Requesting Alternate Testing

The licensee states:

> Failure of these valves to close after exercising during power operation would result in a loss of reactor coolant. Additionally, these valves cannot be exercised at a pressure below 100 psig and the position of the main stage of this 2 stage relief valve can only be determined by indirect means.

2.1.2 Alternate Testing

The licensee proposes:

> Each pilot operating assembly is removed and sent to an independent testing laboratory each refueling outage. The pilot assemblies are inspected and set-point tested in accordance with ASME OMc Code, 1994 Addenda, Appendix I to determine their operating condition. Each pilot assembly is also stroke timed to monitor degradation and ensure that it actuates within an acceptable time range. Each pilot assembly is repaired and/or adjusted to ensure its operability prior to re-installation.
>
> Additionally, each valve is exercised using the manual control switch at least once every 18 months.
>
> This bench testing, pilot stroke timing, maintenance/adjustments, and inspection performed each refueling outage should ensure that the valves are maintained in a state of operational readiness.

2.1.3 Evaluation

Each main steam safety and relief ADS valve consists of a main stage and a pilot stage. The body of the main stage contains the main steam inlet and discharge ports. The main disc is seated in the discharge port and is attached to the main piston. The pilot stage or "topworks" is a separate component. The bonnet of the pilot stage is flanged to the main stage body over the main piston. The pilot stage functions to vent the area over the main piston when the inlet pressure reaches the setpoint pressure. Venting this volume actuates the piston and unseats the disc, thereby allowing steam to flow through the main stage discharge port. The pilot valves are totally enclosed with no visible moving parts. There are no position indication devices installed on either the pilot or main stage valves.

As discussed in the December 10, 1991, SE, stroke timing the ADS valves by conventional methods is impractical because their typically fast stroke times could yield results with a high degree of uncertainty due to the variations in the response times of the individuals performing the test. In addition, variations in steam pressure and other system variables which may not be precisely duplicated from test to test could produce variations in valve stroke times that may mask changes in valve condition. It would be a burden for the licensee to install instrumentation to facilitate stroke timing the valves because the results may not accurately reflect the valve condition.

The licensee has proposed to perform inspection and exercising activities on the main steam safety and relief valves which includes removing all the pilot valves on both units and inspecting and setpoint testing them every refueling outage. Exercise testing of the ADS valves should be performed once the valves are reinstalled during startup from the refueling outage. The proposed alternate testing and inspection methods provide a reasonable assurance of operational readiness because the inspection and maintenance activities monitor the valves for degradation. In addition, exercising the valves during startup would confirm that they have been properly reinstalled.

2.1.4 Conclusion

Relief from the Code stroke time measurement requirements for the ADS valves is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility. The relief is granted with the provision that exercising of the main steam safety valves be conducted during the initial startup after refueling outages to ensure that the valves have been properly reassembled.

2.2 Comments on Review of Hatch IST Program Pump Notes

A review of the pump notes was performed to verify their validity and consistency with the Code requirements and regulatory guidance. The following discrepancies were noted as a result of this review:

2.2.1 Pump Note 6

The licensee stated that the reactor core isolation cooling (RCIC) system does not fall within the scope requirements of the ASME OM Code as implemented by 10 CFR 50.55a (i.e. not ASME Class 1, 2 or 3), is not covered by the regulatory position of Regulatory Guide 1.26, and was not designed to facilitate performance of OM Code type pump testing. However, the Hatch Final Safety Analysis Report (FSAR), Section 3.2.2, "System Quality Group Classifications," states that:

> "...system quality group classifications, as defined in NRC Regulatory Guide 1.26 (September 1974), have been determined for each water, steam, or radioactive waste containing component of those fluid systems relied upon to:
>
> - Prevent or mitigate the consequences of accidents and malfunctions originating within the reactor coolant pressure boundary
> - Provide safe shutdown capability of the reactor and maintain it in a safe shutdown condition
> - Contain Radioactive waste"

FSAR Section 3.2.2 further states that "System quality group classifications and design and fabrication requirements, as indicated in Tables 3.2-1 and 3.2-3, meet the requirements of Regulatory Guide 1.26." Table 3.2-1, Sheet 4, lists the RCIC pumps and most of the valves in the RCIC system as Quality Group Classification B which corresponds to ASME Class 2. RCIC Valves identified in Table 3.2-1 as "isolation and within" are listed as Quality Group Classification A which corresponds to ASME Class 1. Therefore, the licensee's statements that the RCIC system is not covered by Regulatory Guide 1.26 and does not fall within the scope of IST are incorrect.

The licensee has also stated that the RCIC system was not designed to facilitate performance of OM Code type pump testing. The Hatch Unit 1 and Unit 2 Technical Specifications (TS) have recently been updated to the BWR/4 Standard TS. Surveillance Requirement SR 3.5.3.3 requires RCIC pump testing every 92 days at reactor pressures ≥920 psig and ≤1058 psig with a pump flow rate ≥400 gpm against a system head corresponding to reactor pressure. This test is equivalent to a quarterly IST pump test. The reactor pressures specified in the TS indicate that this testing is performed at power. FSAR Section 4.7.4 also states that the capability of testing [the RCIC system] during plant operation gives added assurance. Therefore, the licensee's statement concerning the ability to test this system in accordance with the Code is incorrect.

The Hatch TS require the RCIC system to be operable. TS LCO (limiting condition of operation) action statement 3.5.3.A requires that the RCIC system be restored to operable status within 14 days after being declared inoperable.

TS action statement 3.5.3.B requires the reactor to be shut down if the conditions of TS 3.5.3.A are not met.

The RCIC system components, as described in the FSAR, meet the requirements of Regulatory Guide 1.26, are classified as Quality Group Classification A and B which correspond to ASME Safety Class 1 and 2 respectively and are required to be operable in the plant TS. Therefore, it is concluded that the RCIC system is within the licensing basis of Hatch and specific components have a required safety function to bring the reactor to the cold shutdown condition as specified in scope statements of ASME OM Code-1990, Paragraphs ISTB 1.1 and ISTC 1.1. The RCIC pump and applicable system valves should be included within the scope of the licensee's IST program. The licensee should revise their IST program as appropriate and begin testing the applicable components in accordance with the Code requirements.

2.2.2 Pump Note 7

Pump Note 7 states that inlet and discharge pressure will not be recorded for the six diesel fuel oil transfer pumps and that the flow rate will be measured using an ultrasonic flow meter. The line will be used as a fixed resistance system. Not measuring both inlet and discharge pressure is not in accordance with the Code test procedure requirements of Paragraph ISTB 5.2(d). In addition, the testing that the licensee has proposed is not discussed in any prior staff guidance. Therefore, the licensee must submit a relief request to use the proposed alternate testing.

2.3 Comments on Review of Hatch IST Program Valve Notes

A review of the valve notes was performed to verify their validity and consistency with code requirements and regulatory guidance. System P&IDs, and applicable sections of Hatch's FSARs and TS were reviewed to ensure such consistency in the application of these notes. In addition, IST programs of other plants (those with similar designs to Hatch's) were considered when verifying inclusion criteria for different systems and/or components. However, it should be noted that the latter comparisons were only used in cases where inconsistencies were identified between Hatch's IST program and code requirements and regulatory guidance. The following discrepancies were noted as a result of this review:

2.3.1 Valve Note 11

It appears that the licensee is crediting the quarterly exercise requirement of the RHR water level stop check valves (1E11-F126A&B and 2E11-F124A&B) and the core spray water level stop check valves (1(2)E21-F040A&B) by using the manual hand wheel to exercise each valve. The modified response to Question Group 25 in NUREG-1482 states that the use of the handwheel to close stop check valves is consistent with the Code if this achieves the safety-related function of the valve. However, if a prompt closure of these check valves on cessation or reversal of flow is required to accomplish their safety function, closure must be verified by either reverse flow testing or other positive means such as acoustic monitoring or radiography.

A review of P&IDs revealed that each valve listed is in series with another check valve with no intermediate test connections to facilitate back flow testing. However, Section 4.1.1 of NUREG-1482 states, in part, that if only one valve of the in-series check valves is credited in the safety analysis, then verification that the pair of valves is capable of closing is acceptable for IST. Considering the information provided in the aforementioned sections of NUREG-1482, the licensee should review the guidance provided in the NUREG and revise their IST program accordingly.

2.3.2 Valve Notes 7 and 12

Valve Note 12 states, in part, that the core spray pump discharge check valves (1(2)E21-F003 A & B) which have a normal position of closed and safety positions of open and closed are verified to be in the closed position by the TS requirement to confirm that the pump discharge piping is completely filled. Valve Note 7, which also applies to these core spray valves, states that these valves are tested to the open position either quarterly or during normal operation of the associated pump. The guidance in NUREG-1482, Question Group 24, regarding Position 3 of GL 89-04 states, "if a valve performs a safety function in both the open and closed positions, the Code requires that the valves be exercised to the open position and then be verified to close." A review of the P&IDs indicates that the testing could be performed such that the check valves are verified closed after their test in the open direction. It is not clear whether the testing of the core spray check valves adheres to this guidance. The licensee should review the testing of these valves and revise their IST program as necessary.

2.3.3 Valve Note 13

Valve Note 13 states, in part, that its associated valves are not provided with test connections to enable any measurements during pump testing and that partial flow will be confirmed by indirect means after reassembly. This note is applied to certain minimum flow line valves including RHR minimum flow line valves 1E11-F046A & B. This note is consistent with the guidance provided in Section 4.1.2 of NUREG-1482. However, upon reviewing the IST valve list it appears that this note may also be applicable to RHR minimum flow line valves 1E11-F046C & D and 2E11-F046A-D; as the configuration for these valves appears identical to the 1E11-F046A & B valves. The licensee should review the scope of Note 13 and revise their IST program as necessary.

2.3.4 Valve Note 22

Valve Note 22 states, in part, that the forward flow operability of the associated check valves (service water motor cooling water check valves 1P41-F438A & B, and 2P41-F306A & B) will be verified quarterly during pump testing by observation of free flow through the sight glass located downstream of the check valves. However, Position 1 to GL 89-04 clearly states that full flow testing of check valves requires that the flow through the valve be known. Additionally, in the response to Question Group 1 to this Position, the staff stated that "some form of quantitative criteria should be established to demonstrate full-stroke capability." With regard to alternate testing, it is stated in the response to Question Group 8 that, "in general, the licensee should demonstrate that the alternate test is quantifiable and repeatable." The testing proposed by the licensee is a qualitative test which is not quantifiable. This test verifies that some flow is achieved through the valve; however, this test alone would not be conclusive in determining whether the valve is capable of passing the maximum required accident condition flow. In addition, the proposed testing would not provide a means for tracking valve degradation. The licensee should revise the testing of this valve to provide quantifiable acceptance criteria that will monitor for degradation in accordance with Code requirements.

2.3.5 Valve Notes 16, 17, 19 and 20

These notes are related to valves in the RCIC system. Section 2.2.1 of this SE concluded that the RCIC system should be included within the scope of the Hatch IST program. Therefore, the licensee should reconsider the actions described in these notes and revise their IST program accordingly.

3.0 GENERAL RELIEF REQUESTS

3.1 Relief Request RR-G-1

The licensee is requesting to use the requirements of ASME OM-1990 for the inservice testing requirements of pumps and valves, with the exception of Mandatory Appendix I which applies to safety/relief valves. The licensee is also requesting that the requirements specified for safety/relief valves in ASME OM-1995 be used for inservice testing.

3.1.1 Licensee's Basis for Requesting Relief

The licensee states:

> The ASME/ANSI OM document was issued as a Code with the ASME OM Code 1990 Edition. This edition was amended with the OMa Code 1991 Addenda, the OMb Code 1992 Addenda, and the OMc Code 1994 Addenda. The ASME OM Code 1995 Edition was issued in early 1995. With each addenda and edition of the ASME OM Code, the ASME OM Code Committee has included updated inservice testing requirements based on improved knowledge, operating history and experience and changes in testing technology. Beginning with the ASME OM Code 1990 Edition, the format of the document was also changed to read like a Code instead of a Standard as it was initially drafted. Therefore, application of later versions of the ASME OM Code, than specified in 10 CFR 50, should enhance the quality of the IST program.

3.1.2 Alternate Testing

The licensee proposes:

> The versions of the ASME OM Code utilized for the updated E. I. Hatch, Unit 1 and 2, Inservice Testing Program shall be as specified below.
>
> Inservice Testing of Valves (all except safety/relief valves) - ASME OM Code 1990 Edition
>
> Inservice Testing of Pumps - ASME OM Code 1990 Edition
>
> Inservice Testing of Safety/Relief Valves - ASME OM Code 1995 Edition

3.1.3 Evaluation

This request was evaluated in a letter from the NRC dated August 29, 1995. The letter stated that the 1990 Edition of the OM Code contains essentially the same requirements as the OM standards with the exception that the general administrative requirements which were previously covered by Subsection IWA of ASME Section XI are now included in Subsection ISTA of the OM Code.

The 1995 Edition of Appendix I corrects several editorial problems and clarifies a number of issues from the earlier editions. Implementing only the portion of the 1995 Edition of the OM Code that addresses testing of pressure relief devices is acceptable because Appendix I is included in both the 1990 and 1995 Editions of the OM Code. The 1995 Edition of the OM Code does include a clarification in the scope of the pressure relief devices that are subject to the requirements of inservice testing. Since the change is a clarification and not a change in the definition of the scope, it is not necessary to impose the revised scope statement from Subsection ISTC of the 1995 Edition of the OM Code.

Because the testing will be performed in accordance with requirements that are essentially the same as those referenced in the current regulations, the proposed plan provides an acceptable level of quality and safety. The licensee should note that the requirements of Appendix I augment the rules of Subsection ISTC in their IST program.

3.1.4 Conclusion

The alternative was authorized pursuant to 10 CFR 50.55a(a)(3)(i) in the letter from the NRC dated August 29, 1995, based on the alternative providing an acceptable level of quality and safety. The licensee should revise their IST program to indicate that the requirements of Appendix I augment the rules of Subsection ISTC in their IST program.

3.2 Relief Request RR-G-2

The licensee has proposed to update the Hatch Units 1 and 2 IST programs concurrently to the applicable ASME Codes listed in relief request RR-G-1. Based on the commercial operation dates, the third ten-year interval for Unit 1 is required to begin on January 1, 1996, while the Unit 2 third ten-year interval is not required to begin until September 6, 1999.

3.2.1 Licensee's Basis for Requesting Relief

The licensee states:

> The ISI Program submittal for the second 10-year interval for E. I. Hatch Unit 2 included Relief Request 6.1.2 which requested approval to allow start of the second 10-year interval on January 1, 1986. This relief request was granted and subsequently both Hatch Units ISI and IST Programs were updated to the same edition of the ASME XI Code applicable at that time. The ISI and IST Program intervals for both units have been implemented concurrently since that date.
>
> The commercial operation date for Hatch Unit 1 was December 31, 1976. The commercial operation date for Hatch Unit 2 was September 5, 1979. Therefore, the Hatch Unit 2 ISI/IST Programs for the second 10-year interval were updated approximately 40 months early.
>
> Maintaining both units on the same interval schedule allows both IST programs to be developed utilizing the same edition of the Code, will make it easier for involved personnel to become familiar with the Code requirements, will ensure a greater degree of consistency for IST between the units, and will reduce the cost associated with surveillance procedure revisions for the program update and for maintenance of the program documents.

3.2.2 Alternate Testing

The licensee proposes:

> Update the E. I. Hatch Nuclear Plant Unit 2 IST Program concurrent with the Unit 1 third 10-year interval IST Program update due on December 31, 1995. The Unit 2 IST Program will be updated concurrent with the Unit 1 IST Program in accordance with the applicable regulations for the remainder of the plant life.

3.2.3 Evaluation

The licensee has proposed to update the Unit 2 IST program more frequently than required in the regulations to maintain both units on the same interval. This will allow both units to have IST programs to be developed under the same edition of the Code which has obvious benefits. In addition, this approach follows the guidance presented in NUREG-1482, Section 3.3.2.

3.2.4 Conclusion

The alternative to maintain concurrent intervals for the Hatch Units 1 and 2 IST programs is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

3.3 Relief Request RR-G-3

The licensee has proposed to complete the implementation of their third ten-year IST program according to the schedule detailed below. The third ten-year IST program will be fully implemented by September 1, 1996. The licensee has utilized the guidance of NUREG-1482, Section 3.3.3, in the implementation of their third ten-year IST program.

3.3.1 Licensee's Basis for Requesting Relief

The licensee states:

> The surveillance testing requirements of the 3rd interval IST Program are not significantly different from those included in the existing 2nd interval IST Program. The ASME Section XI Code, 1980 Edition with the Winter 1981 Addenda was utilized for the 2nd interval program, whereas the OM Code 1990 and 1995 Editions have been utilized for development of the 3rd interval program (See RR-G-1).
>
> The 2nd interval program was revised in 1990 to address NRC GL 89-04 at which time the testing requirements of the OM Code were applied for pumps. Pump testing at Hatch presently utilizes the OM Code 1990 Edition.
>
> Power-operated valve exercising and stroke timing requirements of the 1990 OM Code require the use of a reference stroke time as opposed to comparison to the previous stroke time required by the ASME XI Code. The actual testing is the same, acceptance limits and evaluation requirements are different between ASME XI and the OM Code.
>
> Safety and relief valve testing is more clearly defined in OM Code Appendix I, and is defined for each type and class of valve, but the required testing is not significantly different from that of the ASME XI Code which references ANSI/ASME PTC 25.3-1976.
>
> NRC NUREG-1482, paragraph 3.3.3, recommends that if a timely implementation of the updated IST Program requirements is not possible, that the licensee submit a schedule which identifies the

proposed schedule for implementation. This schedule should be submitted prior to the beginning of the new interval.

Revision of approximately one-hundred IST surveillance procedures within a short (3 month) time period would place undue hardship on plant personnel who are also responsible for plant operation and support of a fall 1995 Unit 2 outage, and a spring Unit 1 1996 outage.

NRC review and approval of IST Program updates has historically required a significant amount of time. The licensee is at the mercy of the regulators when coordinating and scheduling surveillance procedure revisions to implement an IST Program update while still maintaining and existing program's testing requirements.

3.3.2 <u>Alternate Testing</u>

The licensee proposes:

GPC will implement a transition from the existing IST Program to the 3rd Interval IST Program in accordance with the below described schedule.

- 3rd Interval IST Program effective on January 1, 1996. Any program revisions required as a result of NRC review and issue of SER will occur in accordance with schedule included in SER. Existing IST Program will also remain in effect until October 1, 1996.

- GPC administrative control procedures applicable to the 3rd Interval IST Program update to be revised and effective on January 1, 1996.

- GPC to begin revision of IST surveillance procedures on a system by system basis in January, 1996. System by system surveillance procedure revisions to continue until September 30. 1996.

- All surveillance procedures to be revised and effective and IST implementation to be in compliance with 3rd Interval IST Program by September 30, 1996. Any procedure revisions required as a result of NRC review and issue of SER will occur in accordance with schedule included in SER.

- 2nd Interval IST Program to be voided effective October 1, 1996.

3.3.3 Evaluation

This request was evaluated in a letter from the NRC dated August 29, 1995. The licensee has proposed to implement the complete IST program by October 1, 1996. The inservice testing requirements for pumps are currently in accordance with the 1990 Edition of the OM Code. Valve testing is currently under ASME Section XI. The proposed schedule is considered reasonable because the changes in the Code requirements do not result in a major redirection in the methods of performing testing. Therefore, the proposed plan provides an acceptable level of quality and safety.

3.3.4 Conclusion

The alternative was authorized pursuant to 10 CFR 50.55a(a)(3)(i) in the letter from the NRC dated August 29, 1995, based on the alternative providing an acceptable level of quality and safety.

4.0 PUMP RELIEF REQUESTS

4.1 Relief Request RR-P-1

The licensee has requested relief from the vibration instrument frequency response range requirements of ASME OM Code-1990, Section ISTB 4.6.1(f), for the instrumentation designated to measure vibration parameters of the standby liquid control pumps. The licensee has proposed to use the existing vibration instrumentation which does not meet the minimum frequency response range requirements specified by the Code.

4.1.1 Licensee's Basis for Requesting Relief

The licensee states:

> The Standby Liquid Control (SBLC) Pumps operate at 370 RPM (6.2 Hz), therefore the instrument frequency response range of the Plant Hatch IST Program instrumentation does not satisfy the Code requirement.
>
> In lieu of the requirements of ISTB 4.6.1(f), the vibration measuring instrument frequency response range utilized for the Standby Liquid Control Pumps will be as described below.
>
> 1. An I.R.D. Model 810 with accuracy of ±5 percent over a frequency response range of 5.8-10,000 Hz or a CSI Model 2100 analyzer with accuracy of ±5 percent over a frequency response range of 3-5000 Hz (displacement) is utilized for IST.
>
> 2. These lower frequency response limits result from high-pass filters which eliminate low-frequency elements associated with the input signal from the integration process. These

filters prevent low frequency electronic noise from distorting vibration readings thus any actual vibration occurring at low frequencies is filtered out.

3. The SBLC pumps are Union Pump Company reciprocating pumps. The subject pumps utilize roller bearings instead of sleeve bearings. Sleeve bearings can exhibit vibration at sub synchronous frequencies when a condition of oil whirl is present. However, oil whirl does not occur in roller or ball bearings.

4. Roller and ball bearing degradation symptoms typically occur at 1X (6.2 Hz) shaft rotational frequency and greater. Therefore, vibration measurements at frequencies less than shaft speed would not provide meaningful data relative to degradation of the pump bearings.

5. The SBLC pumps are standby pumps only. They are only operated during Technical Specification Surveillance and Inservice Testing which results in very little run time. In the unlikely event that the system is required to perform its safety function, the pump run time would be from 19 to 74 minutes to exhaust the volume of the sodium pentaborate storage tank.

6. In addition to the IST vibration monitoring program, these pumps are included in the site maintenance department vibration program. This program has the capability to perform spectral analysis with equipment which would satisfy the frequency response range requirement of the ISTB 4.6.1(f). The maintenance vibration monitoring may not be performed at a frequency equivalent to that required for IST, but based on the infrequent operation of these pumps, the likelihood that a vibration problem would go undetected by both programs is minimal. The maintenance vibration program will also be utilized to analyze any IST vibration data which placed the pumps in the ALERT or ACTION Ranges. The need for any corrective actions would be based on evaluation of IST and maintenance testing program data.

7. Based on the pump bearing design, the combination of vibration monitoring implemented and the limited operation time, it seems unlikely that a vibration problem not detectable by the equipment being utilized would prevent these pumps from fulfilling their design safety function.

4.1.2 Alternate Testing

The licensee proposes:

> None, use of the existing vibration monitoring equipment which is calibrated to at least ±5 percent full scale over a frequency response range of 5.8-2000 Hz or 3-5000 Hz (SBLC pump nominal shaft speed - 6.2 Hz) should provide sufficient data for monitoring the mechanical condition of the SBLC pumps. This equipment will provide accurate vibration measurements over the frequency range in which typical roller bearing vibration problems occur. This monitoring program should meet the intent of the code and will relieve the utility from the burden and expense involved with procurement, calibration, training and administrative control of new testing equipment which seems unjustified for assessing the mechanical condition of the subject pumps.

4.1.3 Evaluation

The standby liquid control (SLC) pumps 1(2)C41-001A & B have a safety function to provide liquid poison to the reactor vessel to shut down the reactor from a full power condition, independent of any control rod motion, and maintain the reactor subcritical during cooldown. The Code requires that the vibration instrumentation frequency response range used in quarterly testing be from one third pump rotational speed (2.1 Hz for the SLC pumps at Hatch) to 1000 Hz. Nominal running speed for these pumps is 370 rpm (6.2 Hz). The plant has two instruments with ranges of 5.8-10,000 Hz and 3-5,000 Hz. Neither instrument satisfies the Code lower limit of the frequency response range for the SLC pumps at Hatch.

These pumps are positive displacement pumps with rolling element bearings. Pump bearing degradation mechanisms with rolling elements are predominant at running speeds of one times (1X) pump rotational speed and greater. Degradation mechanisms at subsyncronous speeds for the SLC pumps are limited to oil whip and oil whirl which occur only in journal bearing designs.

The licensee has proposed to use the instruments currently available at Hatch. Requiring the licensee to procure new instrumentation to meet the Code requirements would be a hardship if the instrumentation currently available would provide an accurate assessment of the SLC pump bearing condition. The proposed testing provides reasonable assurance of operational readiness because the SLC pumps have rolling element bearings and the instruments used by the licensee are accurate at running speeds of 1X and greater.

4.1.4 Conclusion

The proposed alternative to the Code vibration instrument frequency response range requirements for the SLC pump vibration instrumentation is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the determination that compliance with the specified requirements results in a hardship without a compensating increase in the level of quality and safety.

4.2 Relief Request RR-P-2

The licensee has requested relief from the instrument full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1), for the discharge pressure gages of residual heat removal pumps 1(2)E11-C002A-D. The licensee has proposed to use the installed instrumentation which have full-scale ranges of 3.2-3.3 times the pump discharge pressure reference values.

4.2.1 Licensee's Basis for Requesting Relief

The licensee states:

> The original installed instrumentation associated with these pumps was not designed with the instrument range limits of OM Code ISTB 4.6.1(1) taken into consideration. The actual instrument ranges are itemized below.

INSTRUMENT	RANGE	TEST RANGE	ALLOWABLE RANGE	ACCURACY
1E11-PI-R003A-D	0-600 psig	≈182 psig	0-546 psig	±2 percent
2E11-PI-R003A-D	0-600 psig	≈186 psig	0-558 psig	±2 percent

4.2.2 Alternate Testing

The licensee proposes:

> None, use installed instrumentation.
>
> Even though 1(2)E11-PI-R003A-D exceed the Code-allowable range limit of three times the reference value, this additional gage range only results in approximately 1 psig maximum variance from the Code-allowable in the measured parameter (i.e. 0.02 x 546 = 11 psig versus 0.02 x 600 = 12 psig). Using other instrumentation to account for a 1 psig improvement in measurement accuracy is not justifiable considering the cost associated with such a requirement. These pressure indicators should provide data that is sufficiently accurate to allow assessment of pump condition and to detect degradation.

4.2.3 Evaluation

The eight RHR pump discharge pressure indicators, 1(2)E11-PI-R003A-D, exceed the full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1). The maximum variation in the pressure measurement with the current instrumentation is 12 psig. Compared with the Code allowable maximum accuracy variance of 11 psig, there is a 1 psig variance above the Code accuracy requirement. Requiring the licensee to install instrumentation that meets the Code requirements would not be justified by the limited difference in the information obtained. Compliance with the Code requirements would result in a hardship without a compensating increase in safety because the information gained from a more accurate pressure indicator would not greatly affect the ability to assess the condition of an RHR pump if it were operating in the alert or required action range.

4.2.4 Conclusion

The proposed alternative to the Code instrument full-scale range requirements for the discharge pressure gages of residual heat removal pumps 1(2)E11-C002A-D is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the determination that compliance with the specified requirements results in a hardship without a compensating increase in the level of quality and safety.

4.3 **Relief Request PR-P-3**

The licensee has requested relief from the instrument full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1), for the pump discharge flow meters of the Units 1 and 2 residual heat removal (RHR) systems. The licensee has proposed to use the installed instrumentation which has a full-scale range of 3.2 times the individual RHR pump discharge flow rate reference values for Units 1 and 2.

4.3.1 Licensee's Basis for Requesting Relief

The licensee states:

> The original installed instrumentation associated with these pumps was not designed with the instrument range limits of OM Code ISTB 4.6.1(1) taken into consideration. The actual instrument ranges and loop accuracies are itemized below.

INSTRUMENT	RANGE	TEST RANGE	ALLOWABLE RANGE	ACCURACY
1E11-FI-R603A&B	0-25000 gpm	≈7700 gpm	0-23100 gpm	±1.66%
2E11-FI-R603A&B	0-25000 gpm	≈7850 gpm	0-23550 gpm	±1.22%

COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	LOOP ACCURACY PER ISTB 1.3
1E11-FT-N015A,B 0.5 %	1E11-K600A,B 0.5 %	1E11-FI-R603A,B 1.5 %	1.66 %
2E11-FT-N015A,B 0.5%	2E11-K600A,B 0.5 %	2E11-FI-R603A,B 1 %	1.22 %

> 1(2)E11-FI-R603A(B) exceed the Code allowable full scale range limit of three times the reference value. The indicator range includes consideration for LPCI flow rate (17,000 gpm for two pumps), whereas the IST pump flow rate is 7,700 gpm for Unit 1 and 7,850 for Unit 2. The Code maximum allowable variance in measured flow rate would be 462 gpm (i.e. 0.02 x 23,100) for Unit 1 and 471

gpm (i.e. 0.02 x 23,550) for Unit 2. Whereas the actual maximum variance in measured flow is 425 gpm (i.e. 0.017 x 25,000) for Unit 1 and 325 gpm (i.e. 0.013 x 25,000) for Unit 2. Therefore, the actual accuracy of the installed flow indicators is greater than allowed by the Code, thus the range of the indicator exceeding the Code limit of three times the reference value is of no consequence.

4.3.2 <u>Alternate Testing</u>

The licensee proposes:

None, use installed instrumentation.

Even though 1(2)E11-FI-R603A&B exceed the Code-allowable range limit of three times the reference value, the overall loop accuracy is greater than required by the Code. Therefore, the measured parameter is more accurately displayed than the Code requires.

4.3.3 <u>Evaluation</u>

The four flow indicators in the Units 1 and 2 RHR systems, 1(2)E11-FI-R603A(B), exceed the full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1). The loop accuracy of the Units 1 and 2 flow rate indicators are calibrated to ±1.66 percent and ±1.22 percent of full-scale respectively. This results in the actual variance having a value less than the maximum variance allowed by the Code. The installed instrumentation provides an acceptable level of quality and safety because the variance in the actual test results is more conservative than that allowed by the Code.

4.3.4 <u>Conclusion</u>

The proposed alternative to the Code instrument full-scale range requirements for the flow meters of the Units 1 and 2 RHR systems is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

4.4 <u>Relief Request RR-P-4</u>

The licensee has requested relief from the vibration measurement requirements of ASME OM-1990, Section ISTB 4.6.4(b), for the Units 1 and 2 residual heat removal service water (RHRSW) 1(2)E11-C001A-D and plant service water (PSW) 1(2)P41-C001A-D pumps. The licensee has proposed to take vibration measurements in the area of the pump to motor mounting flange due to the inaccessibility of the upper motor bearing housing.

4.4.1 Licensee's Basis for Requesting Relief

The licensee states:

> The Code required vibration measurements on the upper motor-bearing housing on these vertical line shaft pumps are impractical because of the following reasons.
>
> 1. Plant design did not include permanent scaffolding or ladders which provide access to the top of the motors for the subject pumps.
>
> 2. Physical layout of the pumps and interference with adjacent components does not allow for the installation of temporary scaffolding or ladders which are adequately safe for routine use.
>
> 3. There is a relatively thin cover plate bolted to the top-center of each motor which prevents measurements in line with the motor bearing. Measurement on the edge of the motor housing would be influenced by eccentricity and may not be representative of actual axial vibration.
>
> 4. Special tools (extension rod) for placing the vibration transducers are not practical because placement would not be sufficiently accurate for trending purposes.
>
> 5. Research within the industry has indicated that vibration monitoring of vertical line shaft pumps has been of limited benefit for detecting mechanical degradation due to problems inherent with pump design. The OM Code imposes more stringent hydraulic acceptance criteria on these pumps than for centrifugal or positive displacement pumps. These more stringent hydraulic acceptance criteria place more emphasis on detection of degradation through hydraulic test data than through mechanical test data.

4.4.2 Alternate Testing

The licensee proposes:

> Vibration measurements will be taken in three orthogonal directions, one of which is in the axial direction in the area of the pump to motor mounting flange. This is the closest accessible location to a pump bearing housing and this location is easily accessible for test personnel which should ensure repeatable vibration data and should provide readings which are at least as representative of pump mechanical condition as those required by the Code.

Therefore, application of the OM Code hydraulic testing criteria along with radial and axial vibration monitoring in the area of the pump to motor mounting flange should provide adequate data for assessing the condition of the subject pumps and for monitoring degradation.

4.4.3 Evaluation

The Code requires that vibration measurements for vertical line shaft pumps be taken on the upper motor bearing housing in three orthogonal directions, one of which is axial. The licensee has requested relief for the Units 1 and 2 RHRSW and PSW pumps because of the inaccessibility that test personnel have to the upper motor bearing housing.

Vibration measurements of vertical line shaft pump bearings cannot be measured directly without the installation of permanent instrumentation because the pumps are submerged in the fluid and are not accessible during pump operation. In addition, the thrust bearings for these type of vertical line shaft pumps are usually located in the pump motor. ISTB 1.2(a) excludes drivers except where the pump and driver form an integral unit and the pump bearings are in the driver. Therefore, ISTB 4.6.4(b) requires that the pump vibration measurements for vertical line shaft pumps be taken on the upper motor bearing housing. Table ISTB 5.2-2b also includes more stringent hydraulic requirements for vertical line shaft pumps.

The licensee has proposed to take the three required Code vibration measurements of the Units 1 and 2 RHRSW and PSW pumps on the flange where the motor is mounted to the pump. A report published by the Electric Power Research Institute (EPRI NP-5704M, "Submerged Vertical Shaft Pumps Diagnostics") showed that some information about the mechanical condition of the pump can be obtained from vibration sensors mounted in the vicinity of the pump to motor mounting flange. However, these sensors were not as effective as permanent sensors mounted near the pump bearings which are not required by the Code. The external sensors mounted near the motor did not detect pump degradation as early as the submerged sensors but were able to detect some high vibration peaks. In addition, the study emphasized the value of obtaining performance data to evaluate pump degradation in conjunction with the vibration data.

It would be a hardship for the licensee to construct permanent access to these pumps to measure vibration from the upper motor bearing housing because information obtained would not provide a compensating increase in the level of quality and safety. The proposed testing provides a reasonable assurance of operational readiness because the licensee will be taking vibration measurements in three orthogonal directions at the pump to motor mounting flange which will provide some information as to the mechanical integrity of the pump. In addition, pump hydraulic performance requirements are more stringent for vertical line shaft pumps than for other types of centrifugal pumps.

4.4.4 <u>Conclusion</u>

The proposed alternative to the Code vibration measurement requirements for the Units 1 and 2 RHRSW and PSW pumps is authorized pursuant to 10 CFR 50.55a (a)(3)(ii) based on the determination that compliance with the specified requirements results in a hardship without a compensating increase in the level of quality and safety.

4.5 **<u>Relief Request RR-P-5</u>**

The licensee has requested relief from the instrument quality requirements of ASME OM Code-1990, Section ISTB 4.6.1(a), for the discharge pressure indicators of the Units 1 and 2 core spray pumps. The licensee has proposed to use the installed instrumentation which has a total loop accuracy that exceeds the Code requirements.

4.5.1 <u>Licensee's Basis for Requesting Relief</u>

The licensee states:

> Pressure indicators 1(2)E21-PI-R600A(B) exceed the maximum code allowable total loop accuracy of ±2 percent full scale. The actual instrument ranges and loop accuracies are itemized below.

INSTRUMENT	RANGE	TEST RANGE	ALLOWABLE RANGE	ACCURACY
1E21-PI-R600A&B	0-500 psig	≈290 psig	0-870 psig	±2.06%
2E21-PI-R600A&B	0-500 psig	≈308 psig	0-924 psig	±2.06%

COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	LOOP ACCURACY PER ISTB 1.3
1E21-PT-N001A&B 0.5%	1E21-PI-R600A&B 2%	NA NA	2.06 %
2E21-PT-N001A&B 0.5%	2E21-PI-R600A&B 2%	NA NA	2.06 %

> The indicators used have full scale ranges less than that allowed by the Code. The maximum code allowable variance in measurement is 17 psig (.02 x 870) for Unit 1 and 18 psig for Unit 2 (.02 x 924). By using an indicator with a range less than allowed, the actual maximum variance is 11 psig (.021 x 500) which is more accurate than required by the Code. Therefore, the actual accuracy of the instruments is within the code allowable.

4.5.2 Alternate Testing

The licensee proposes:

> None, the installed instruments are more accurate than required by the Code for the range of application.

4.5.3 Evaluation

The four core spray discharge pressure indicators, 1(2)E21-PI-R600A(B), exceed the maximum Code allowable total loop accuracy requirements of ±2 percent. Each indicator has a full-scale range less than the maximum allowed by the Code. This results in the actual variance having a value less than the maximum variance allowed by the Code. The installed instrumentation provides an acceptable level of quality and safety because the variance in the actual test results is more conservative than that allowed by the Code.

4.5.4 Conclusion

The proposed alternative to the Code instrument quality requirements for the discharge pressure indicators of the Units 1 and 2 core spray pumps is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

4.6 Relief Request RR-P-6

The licensee has requested relief from the instrument full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1), for the inlet pressure indicators of the Units 1 and 2 high pressure coolant injection (HPCI) pumps. The licensee has proposed to use the installed instrumentation which has a full-scale range in excess of the Code requirements.

4.6.1 Licensee's Basis for Requesting Relief

The licensee states:

> 1(2)E41-PI-R004 exceed the range limit of three times the reference value. The actual instrument ranges are itemized below. The indicators are calibrated to ±1 percent full scale accuracy which results in the final variance being within the maximum allowable by the code (i.e. 1 psig versus 1.6 psig for Unit 1 and 1 psig versus 1.8 psig for Unit 2).

INSTRUMENT	RANGE	TEST RANGE	ALLOWABLE RANGE	ACCURACY
1E41-PI-R004	15"Hg-100 psig	≈27 psig	0-81 psig	±1 %
2E41-PI-R004	15"Hg-100 psig	≈30 psig	0-90 psig	±1 %

4.6.2 Alternate Testing

The licensee proposes:

> None, the installed pressure indicators provide measurements which are within the Code allowable accuracy.

4.6.3 Evaluation

The HPCI inlet pressure indicators, 1(2)E41-PI-R004, exceed the maximum Code allowable full-scale range requirements of three times the reference value. Each indicator has an instrument accuracy over the full-scale range less than the maximum accuracy allowed by the Code. This results in the actual variance having a value less than the maximum variance allowed by the Code. The installed instrumentation provides an acceptable level of quality and safety because the variance in the actual test results is more conservative than that allowed by the Code.

4.6.4 Conclusion

The proposed alternative to the Code instrument full-scale range requirements for the inlet pressure indicators of the Units 1 and 2 HPCI pumps is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

4.7 Relief Request RR-P-7

The licensee has requested relief from the instrument full-scale range requirements of ASME OM Code-1990, Section ISTB 4.6.1(b)(1), for the flow meters of the Units 1 and 2 HPCI pumps. The licensee has proposed to use the installed instrumentation which have total loop accuracies that exceed the Code requirements.

4.7.1 Licensee's Basis for Requesting Relief

The licensee states:

> Flow indicators 1(2)E41-FI-R612 exceed the maximum code-allowable total loop accuracy. The actual instrument loop accuracies are itemized below. The indicator used has a full scale range less than that allowed [by the Code]. Therefore, the maximum variance allowable by the Code is 255 gpm (.02 x 12750) whereas the actual maximum variance is 106 gpm (.0212 x 5000). Therefore, the actual accuracy of the instrument loop is better than that allowable [sic] by the Code.

INSTRUMENT	RANGE	TEST RANGE	ALLOWABLE RANGE	ACCURACY
1E41-FI-R612	0-5000 gpm	≈4250 gpm	0-12750 gpm	±2.12 %
2E41-FI-R612	0-5000 gpm	≈4250 gpm	0-12750 gpm	±2.12 %

COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	COMPONENT/ ACCURACY	LOOP ACCURACY PER ISTB 1.3
1E41-FT-N008 0.5%	1E41-K601 0.5%	1E41-FI-R612 2%	2.12%
2E41-FT-N008 0.5%	2E41-K601 0.5%	2E41-FI-R612 2%	2.12%

4.7.2 Alternate Testing

The licensee proposes:

> None, the installed flow indicators provide measurements which are within the Code-allowable accuracy.

4.7.3 Evaluation

The HPCI pump flow meters, 1(2)E41-FT-N008, exceed the maximum Code allowable total loop accuracy requirements of ±2 percent. Each flow meter has a full-scale range less than the maximum allowed by the Code. This results in the actual variance having a value less than the maximum variance allowed by the Code. The installed instrumentation provides an acceptable level of quality and safety because the variance in the actual test results is more conservative than that allowed by the Code.

4.7.4 Conclusion

The proposed alternative to the Code instrument quality requirements for the flow meters of the Units 1 and 2 HPCI pumps is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

4.8 **Relief Request RR-P-8**

The licensee has requested relief from the Code vibration measurement requirements of ASME OM Code-1990, Section ISTB 4.6.4(b), for the Unit 2 standby plant service water pump 2P41-C002. The licensee has proposed to take vibration measurements in the area of the pump to motor mounting flange due to the inaccessibility of the upper motor bearing housing.

4.8.1 Licensee's Basis for Requesting Relief

The licensee states:

> The Code-required vibration measurements on the upper motor-bearing housing on this vertical line shaft pump are impractical because of the following reasons.
>
> 1. The motor has a cooling fan mounted at the top which is attached to the rotating shaft. The fan is protected by a relatively thin cover plate which prevents access to the motor housing for vibration measurements. Removing the cover does not provide for transducer placement since the rotating fan would still be in the way.
>
> 2. Research within the industry has indicated that vibration monitoring of vertical line shaft pumps has been of limited benefit for detecting mechanical degradation due to problems inherent with pump design. The OM Code imposes more stringent hydraulic acceptance criteria on these pumps than for centrifugal or positive displacement pumps. These more stringent hydraulic acceptance criteria place more emphasis on detection of degradation through hydraulic test data than through mechanical test data.

4.8.2 Alternate Testing

The licensee proposes:

> Vibration measurements will be taken in three orthogonal directions, one of which is in the axial direction in the area of the pump to motor mounting flange. This is the closest accessible location to a pump bearing housing and this location is easily accessible for test personnel which should ensure repeatable vibration data and should provide readings which are at least as representative of pump mechanical condition as those required by the Code.
>
> Therefore, application of the OM Code hydraulic testing criteria along with radial and axial vibration monitoring in the area of the pump to motor mounting flange should provide adequate data for assessing the condition of the subject pumps and for monitoring degradation.

4.8.3 Evaluation

The Code requires that vibration measurements for vertical line shaft pumps be taken on the upper motor bearing housing in three orthogonal directions, one of which is axial. The licensee has requested relief for the Unit 2 standby service water pump because a cooling fan that is mounted to the top of the pump prohibits access to the motor bearing.

Vibration measurements of vertical line shaft pump bearings cannot be measured directly without the installation of permanent instrumentation because the pumps are submerged in the fluid and are not accessible during pump operation. In addition, the thrust bearings for these type of vertical line shaft pumps are usually located in the pump motor. ISTB 1.2(a) excludes drivers except where the pump and driver form an integral unit and the pump bearings are in the driver. Therefore, ISTB 4.6.4(b) requires that the pump vibration measurements for vertical line shaft pumps be taken on the upper motor bearing housing. Table ISTB 5.2-2b also includes more stringent hydraulic requirements for vertical line shaft pumps.

The licensee has proposed to take the three required Code vibration measurements of the Unit 2 standby plant service water pump on the flange where the motor is mounted to the pump. A report published by the Electric Power Research Institute (EPRI NP-5704M, "Submerged Vertical Shaft Pumps Diagnostics") showed that some information about the mechanical condition of the pump can be obtained from vibration sensors mounted in the vicinity of the pump to motor mounting flange. However, these sensors were not as effective as permanent sensors mounted near the pump bearings which are not required by the Code. The external sensors mounted near the motor did not detect pump degradation as early as the submerged sensors but were able to detect some high vibration peaks. In addition, the study also emphasized the value of obtaining performance data to evaluate pump degradation in conjunction with the vibration data.

It would be a hardship for the licensee to modify this pump to measure vibration from the upper motor bearing housing because information obtained would not provide a compensating increase in the level of quality and safety. The proposed testing provides a reasonable assurance of operational readiness because the licensee will be taking vibration measurements in three orthogonal directions at the pump to motor mounting flange which will provide some information as to the mechanical integrity of the pump. In addition, pump hydraulic performance requirements are more stringent for vertical line shaft pumps than for other types of centrifugal pumps.

4.8.4 <u>Conclusion</u>

The proposed alternative to the Code vibration measurement requirements for the Unit 2 standby plant service water pump is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the determination that compliance with the specified requirements results in a hardship without a compensating increase in the level of quality and safety.

4.9 **Relief Request RR-P-9**

The licensee has requested relief from the vibration value requirements specified in Table ISTB 5.2-2a, "Ranges for Test Parameters," of the ASME OM

Code-1990. This relief request is a general request intended to be applicable to all pumps in the licensee's IST program. The licensee has proposed to assign absolute alert and required action range limits for pumps that, according to the licensee's criteria, are classified as "smooth running pumps."

4.9.1 Licensee's Basis for Requesting Relief

The licensee states:

> Small absolute changes in vibration for a smooth running pump (i.e. a reference value ≤.075 in./sec or 2 mils) would potentially result in ALERT and Required ACTION Ranges being declared for exceeding the $2.5V_r$ or $6V_r$ limits even though the pump is still operating satisfactorily. Pumps with very small reference values may experience some degradation and yet still be operating acceptably. Therefore, it is unwarranted to place such pumps in the ALERT or ACTION Range based on this very small increase in measured vibration magnitude.

4.9.2 Alternate Testing

The licensee proposes:

> In lieu of the requirements of TABLE ISTB 5.2-2a, ranges for vibration acceptance criteria for pumps with reference values ≤.075 in/sec or 2 mils (smooth running pumps) will be as outlined below.
>
> The ALERT Range for smooth running pumps will be > 0.19 in/sec to 0.45 in./sec. or 6 mils to 14 mils, and the Required ACTION Range starts at any value above 0.45 in./sec or 14 mils.

4.9.3 Evaluation

This relief request was previously granted as a general relief request in the December 10, 1991, SE. The licensee's current relief request maintains the generality of the request for smooth running pumps by not specifically identify the pumps that are within the scope of the request. It is the current practice of the NRC to review safety-related pump vibration issues on a component specific basis. Incorporation of absolute reference values for smooth running pumps into the Code is currently being investigated by the Code committee and to date no consensus on approval has been reached.

A similar relief request had also been approved at Catawba. However, in September of 1994 during monthly predictive maintenance vibration monitoring on one of the pumps applicable to the approved alternative at Catawaba, an increasing vibration value was noted on three successive monthly vibration tests. The pump was disassembled and discovered to have severely degraded bearings. The vibration levels were in excess of 2.5 times the reference value but were below the alert range absolute limit approved in the relief request. The predictive maintenance testing was not associated with the licensee's inservice testing of the pump.

In light of the recent event at Catawba, and the current lack of consensus among industry representatives on this issue, it is not prudent to grant this relief request on a general basis. If the licensee has specific pumps that fall within the scope of their proposed relief request, and their testing methodology will allow detection of pump degradation at the absolute vibration limits proposed in their relief request, then the licensee may submit separate relief requests for each applicable pump. Any additional requests for relief on smooth running pumps should contain information such as vibration history, maintenance history and, if the capability exists at the plant, a recent spectral history of the pumps. For the alternative to be authorized, the information must support the establishment of absolute limits that will allow for normal variation in pump vibration while providing adequate assurance that mechanical pump degradation will be detected.

4.9.4 Conclusion

Relief is denied. The licensee may submit separate relief requests for each applicable pump.

4.10 Relief Request RR-P-10

The licensee has requested relief from the vibration value requirements specified in Table ISTB 5.2-2a, "Ranges for Test Parameters," of the ASME OM Code-1990 for the HPCI pump 1(2)E41-C001. The licensee has proposed to raise the Code vibration alert range limit from $2.5V_r$ to $6V_r$ or 0.325 inches/second (in/sec) to 0.400 in/sec.

4.10.1 Licensee's Basis for Requesting Relief

The licensee states:

> The HPCI pump design resulted in a structural casing resonance at very near the recommended running speed. This results in a peak vibration value on the main pump inboard bearing housing in the vertical direction that routinely exceeds the 0.325 in/sec maximum value thus placing the HPCI pump in the Alert Range.
>
> Review of spectral data for the pumps results in the largest peak vibration values at 1X (usually unbalance), 2X (usually misalignment), 5X (vane pass) and 7X (vane pass). Of these peaks, the highest occurs at 1X. This 1X peak also fluctuates as the speed of the HPCI pump is varied.
>
> The HPCI pump IST is performed by setting the flow and the turbine speed at the reference values and then monitoring the differential pressure. The turbine speed and flow rate are set as close as can be read on the instrumentation, however, the HPCI flow controller

varies the turbine speed within some range to maintain the selected flow rate. Thus some change in speed does occur.

The nominal turbine speed for the HPCI pump IST is 3,800 rpm (63.3 Hz). A dead blow hammer test of the HPCI pump casing resulted in a natural frequency of 65.9 Hz. During a trial test, the vibration magnitude of the inboard bearing doubled (0.11 in/sec to 0.22 in/sec) when the turbine speed was increased from 62.94 Hz (3,776 rpm) to 64.8 Hz (3,880 rpm). While this amplitude is not sufficient to place the pump in the Alert Range, when added to that of some nominal unbalance (1X) or amplitudes occurring at frequencies from other sources, the vibration data sometimes exceeds the 0.325 in/sec allowable by the Code resulting in an increase in test frequency for the pump. This phenomenon occurs randomly which indicates that it is not indicative of mechanical degradation. Spectral vibration analysis by the maintenance engineering department indicates that there are no mechanical concerns with HPCI pump operation. Shaft vibration data obtained from proximity probes revealed very low amplitudes at the 1X operating speed with vibration being 0.4 mils. This shaft data did not detect any natural frequencies associated with the shaft which indicates that the natural frequencies identified for the bearing housing are structurally related with no participation from the shaft.

Based on testing data taken to date, and evaluation by the maintenance engineering department, there is no apparent trend for mechanical degradation and no apparent justification for increasing the HPCI pump test frequency when the vibration level randomly exceeds the 0.325 in/sec Code allowable value.

4.10.2 Alternate Testing

The licensee proposes:

> The Alert Range for the HPCI Pump will be set at 2.5Vr to 6Vr or 0.4 in/sec to 0.7 in/sec. In addition to the normal HPCI pump IST, the maintenance engineering department will routinely perform spectral analysis of the vibration data to ensure that no trend to mechanical degradation goes undetected. This nominal increase in the lower limit for the Alert Range should not affect the overall operability of the HPCI pump and the maximum allowable vibration limits for the Required Action Range are being maintained.

4.10.3 Evaluation

The Code requires the measurement of hydraulic and mechanical performance data on these pumps to assess the condition of the component. Mechanical performance data is in the form of vibration measurement. Table ISTB 5.2-2a establishes criteria to assess pump degradation for centrifugal pumps. The criteria are based, in part, on the reference vibration value (V_r) of the pump. The alert range is defined in the Code as $2.5V_r$ to $6V_r$ to a maximum value of 0.325 inches/second. When a pump enters the alert range, ISTB 6.1 requires that frequency specified in Paragraph ISTB 5.1 be doubled until the cause of the deviation is determined and the condition corrected. The required action range is defined as vibration which exceeds 6 times the reference value or a maximum value of 0.700 inches/second. Paragraph ISTB 6.1 requires a pump with a vibration value measured in the required action range to be declared inoperable.

The HPCI pump has a safety function to operate to inject water into the reactor vessel in the event of a small-break LOCA. The HPCI pump system is a unique system in that it incorporates a main and booster pump coupled together through a gear reduction system to a common steam turbine. Several boiling water reactors have experienced elevated levels of vibration related to the design of the HPCI pump. Some reductions in vibration have been achieved by installing new impellers in the main and booster pumps. Spectral analysis of these pumps has been used to better assess the sources of vibration.

The licensee has determined through additional testing that HPCI pump design has a structural casing resonance slightly above the nominal turbine rotational speed. Because of variations in turbine speed caused by the pump flow controller to maintain a set flow rate, certain turbine speeds within the operating range of the HPCI pump system result in elevated vibration levels. Vibration spectral analysis of the HPCI pump showed that the increase was at the one times running speed frequency in the vertical direction of the main pump inboard bearing. This increase in vibration amplitude appears to be a function of the turbine speed and not a result of pump degradation.

Because of the Code requirements, the licensee would be required to increase the frequency of pump testing from quarterly to approximately every six weeks. Since the increased vibration levels are not attributed to degradation of the pump, it would be a hardship for the licensee to perform this increased testing on the HPCI pump. The licensee has proposed to raise the alert range absolute limit from 0.325 in/sec to 0.400 in/sec. The increased absolute limit for the vibration alert range provides a reasonable assurance of operational readiness because this range is greater than the normal range in which this increased vibration occurs yet still provides for preservation of the Code alert range which will continue to be utilized as intended. In addition, the licensee has stated that spectral analysis will be conducted periodically to assess the condition of the pump which is in excess of the Code requirements. However, the alternative only applies to the directions of vibration which have experienced increased vibration levels due to the resonance phenomenon which, as stated in the licensee's relief request, was the vertical direction of the inner main pump bearing. All other directions will continue to be subject to the vibration limits specified in Table ISTB 5.2-2b.

4.10.4 Conclusion

The proposed alternative to the Code vibration alert range limits of Table ISTB 5.2-2b for the HPCI pump is authorized pursuant to 10 CFR 50.55a (a)(3)(ii) based on the determination that compliance with the specified requirements results in a hardship without a compensating increase in the level of quality and safety. The alternative is authorized with the provision that the alternative only applies to the vertical direction of the inner main pump bearing.

4.11 **Relief Request RR-P-11**

The licensee has requested relief from the requirements of ASME OM Code-1990, Paragraph ISTB 6.2, "Time Allowed for Analysis of Tests," for all pumps in the licensee's IST program. The licensee has proposed to use the language included in the OM 1995 Edition, Paragraph ISTB 6.2.2, as opposed to the current language in ISTB 6.2.

4.11.1 Licensee's Basis for Requesting Relief

The licensee states:

> The ASME Section XI Code, Subsection IWP-3230(c) stated that:
>
> "Corrective action shall be either replacement or repair per IWP-3111, or shall be an analysis to demonstrate that the condition does not impair pump operability and that the pump will still fulfill its function. A new set of reference values shall be established after such analysis."
>
> The OMc-1994 Addenda (ISTB 6.2.2) and the OM 1995 Edition (ISTB 6.2.2) both state that:
>
> "If the measured test parameter values fall within the required action range of Table 5.2.1-1, Table 5.2.1-2, Table 5.2.2-1, or Table 5.2.3-1, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition is corrected, or an analysis of the pump is performed and new reference values are established in accordance with ISTB 4.6."
>
> The Code applicable for the second interval IST Program and the latest issued Code both provide for analysis of pump test data in lieu of repair or replacement of the pump if the test parameters fall within the required action range. The OM Code-1990 Edition did not include such provisions. Communications with members of the OM Code Committee indicate that this was an oversight and that it was never intended to delete the ability to analyze the test data and determine if the pump is still capable of performing its intended safety function.

4.11.2 Alternate Testing

The licensee proposes:

> Should pump test parameters fall within the required action range of Table ISTB 5.2-2 (OM Code 1990 Edition), then the OM Code 1995 Edition, subsection ISTB 6.2.2 will be utilized. Since subsection ISTB 4.6 in the 1995 Code Edition references ISTB 6.2.2, subsection ISTB 4.6 from the OM Code 1995 Edition will also be applied.

4.11.3 Evaluation

The corrective action requirements of ASME Section XI, Paragraph IWP-3230(c), allowed licensees to perform an analysis to demonstrate that the current mechanical or hydraulic performance levels of the pump did not impair the pump operability and that the pump would still perform its safety function. Further, this section also allowed the licensee to establish new reference values. There was a concern that repeated establishment of new reference values would allow the pump to operate in a significantly degraded condition from the original pump reference values while meeting the design basis flow and pressure requirements of the system. According to NRC members of the OM committees that were involved in the development of ASME/ANSI OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants," the Code requirements of Paragraph IWV-3230(c) were intentionally omitted to address this concern. This issue is further discussed in NUREG-1482, Section 5.6.

ASME OM Code-1990, Paragraph ISTB 6.2, states that all test data shall be analyzed within 96 hours after completion of a test. The 1995 Edition of the ASME OM Code, Subsection ISTB (which replaces Part 6 for IST of pumps), allows that "[i]f the measured test parameter values fall with the required action range of ISTB 5.2.1.1, Table ISTB 5.2.1.2, Table ISTB 5.2.2-1, or Table ISTB 5.2.3-1, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition is corrected, or an analysis of the pump is performed and new reference values are established in accordance with para. ISTB 4.6." This paragraph actually clarifies that if a pump can be shown to be capable of performing its safety function, it may be returned to service with adjusted reference values. This reflects that there are pumps that have a significant margin over the safety requirements that might degrade from their initial performance, but still be capable of meeting their safety function. Pumps which do not have margin would not be returned to service without repairs or replacement. The analysis must justify that the degradation mechanism will not cause further degradation such that before the next pump test or before repairs can be performed the pump would fail. As such, the alternative will provide an acceptable level of quality and safety for monitoring the pumps.

4.11.4 Conclusion

The alternative to allow the analysis of data and establishment of new reference values for pumps performing outside the acceptable range in accordance with the 1995 edition of the ASME Code, Section ISTB 6.2.2, is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the acceptable level of quality and safety that will be provided by the alternative.

5.0 VALVE RELIEF REQUESTS

5.1 Relief Request RR-V-1

The licensee has requested relief from the inservice seat leakage rate test for containment isolation valve (CIV) requirements of ASME OM Code-1990, Paragraph ISTC 4.3.2, for the main steam line drain CIV 1(2)B21-F016, the HPCI steam supply inboard CIV 1(2)E41-F002, and the RCIC inboard steam supply 1(2)E51-F007. The licensee has proposed to leak rate test these valves in accordance with 10 CFR 50, Appendix J.

5.1.1 Licensee's Basis for Requesting Relief

The licensee states:

> The correct test direction is to pressurize from the inboard side of the valve; however, the piping on the inboard side connects directly to the reactor vessel and cannot be pressurized for testing.

5.1.2 Alternate Testing

The licensee proposes:

> These containment isolation valves will be leak rate tested in the reverse direction as addressed in the Edwin I. Hatch, 10 CFR 50, Appendix J containment leak rate test program for Type C leakage tests. Additionally, these valves are tested in the correct direction during the performance of each 10 CFR 50, Appendix J, Type A integrated leak rate test.

5.1.3 Evaluation

Paragraph ISTC 4.3.2 of the Code requires that leak testing of containment isolation valves be tested in accordance with 10 CFR 50, Appendix J. CIVs that also are pressure isolation valves (PIVs) shall meet the requirements of Paragraph ISTB 4.3.3. The HPCI and RCIC steam side inboard CIVs and the main steam drain line inboard CIV do not appear to have PIV functions because their respective systems are designed for reactor pressure. Therefore, HPCI, RCIC and main steam line drain inboard CIVs are in compliance with the Code requirements and relief is not necessary.

5.1.4 Conclusion

Relief is not required. The licensee's proposed alternate testing is in accordance with the Code requirements.

5.2 Relief Request RR-V-2

The licensee has requested relief from the stroke time acceptance criteria requirements of ASME OM-1990, Section ISTC 4.2.8(d), for main steam isolation valves (MSIVs) 1(2)B21-F022A-D and 1(2)B21-F028A-D. The licensee has proposed to use upper and lower limiting stroke times contained in the TS to determine the stroke time acceptance criteria instead of the 50 percent increase in the stroke time reference value required by the Code.

5.2.1 Licensee's Basis for Requesting Relief

The licensee states:

> ISTC 4.2.4(a) requires that the Owner specify the limiting value of full-stroke time for each power operated valve. For all valves which require stroke timing, except the MSIVs, this limiting value is a maximum allowable stroke time. However, the design basis for the MSIVs imposes a minimum and a maximum allowable stroke time of 3 to 5 seconds respectively. Therefore the MSIVs have a 2 second window of acceptable operating time. Applying a 50 percent increase limit per ITSC 4.2.8(d) from the reference value to a valve which must stroke in a 2 second window is impractical. When the criteria of ISTC 4.2.4(b) are also applied, the stroke time of all power operated valves shall be measured to the nearest second, then the requirements of ISTC 4.2.8(d) become even more impractical.

5.2.2 Alternate Testing

The licensee proposes:

> The MSIVs will be stroke timed during cold shutdown per Cold Shutdown Justification CSJ-V-1 and their closing time will be confirmed to be between 3 and 5 seconds. As soon as it is recognized that an MSIV does not meet this criteria, it will be declared inoperable and the applicable Technical Specification Action Statement entered.

5.2.3 Evaluation

The MSIVs have a safety function to limit the release of radioactive materials to the environment or to limit vessel inventory loss. The valves are automatically closed by logic in the nuclear steam supply shutoff system during a number of abnormal plant conditions such as, for example, main steam line high radiation, main steam line turbine area high temperature, main steam line high flow and reactor low water level. The valves are designed to stroke in not less than three seconds to minimize the pressure and power increase during valve closure and not more than five seconds to limit the release of radioactive material on a downstream steam line break. Minimum and maximum limiting stroke time is a requirement unique to MSIVs.

A similar relief request was approved in the SE dated September 5, 1993. At the time, the Code of record for valve inservice testing at Hatch was the 1980 Edition of ASME Section XI through the winter 1981 Addenda. Paragraph IWV-3417(a) of this edition of the Code required that if the valve stroke time increased by 50 percent over the previous test, then the test frequency shall be increased until corrective action is taken. In addition, the requirements of Paragraph IWV-3413(b) required valves to be measured to the nearest second for valves with stroke times of 10 seconds or less. Therefore it was recognized in this situation that a valve could be required to be placed on an increased frequency of testing when the actual stroke time did not exceed 50 percent. For example, if the previous valve stroke time was 3.4 seconds and the following stroke time was 4.6 seconds, the actual increase in the stroke time would be 22 percent. However, using the Code language of measuring to the nearest second, the stroke time for Code purposes would be from 3 seconds to 5 seconds which equates to an increase of 67 percent. The evaluation concluded that the criteria to establish narrow acceptance criteria as opposed to an increased testing frequency were more conservative than the Code requirements. Therefore, the relief request was approved because it provided an acceptable level of safety.

The ASME OM-1990 Code contains revisions that directly impact this relief request. Section ISTC 4.2.8(d) states that valves with reference stroke times of less than or equal to 10 seconds shall not exhibit a change of ±50 percent from the reference stroke time. In addition, Section ISTC 4.2.4(b) states that the stroke time of all power-operated valves shall be measured to at least the nearest second (note that the licensee's citation of this section in their relief request basis is incorrect). The stroke time measurement provision allows licensees to measure stroke times in tenths of a second. Therefore, given the minimum and maximum limiting stroke times specified in the licensee's Technical Specifications for the MSIVs, the instances when the requirements of Section ISTC 4.2.8(d) would apply would be when a specific MSIV had a reference stroke time of less than or equal to 3.3 seconds. Even if a particular stroke time did not meet the requirements of Section ISTC 4.2.8(d), the corrective action requirements of Section ISTC 4.2.9(b) do not require an increased testing frequency (i.e. from quarterly to monthly) but retest and evaluation of the valve stroke time.

The updated Code corrective action requirements are enhancements to the Code and would not be implemented with the licensee's proposed relief request. Therefore, the proposed testing is not equivalent to the Code and does not provide an acceptable level of safety. In addition, compliance would not result in a hardship without an acceptable level of quality and safety because the Code does not require an increased testing frequency (i.e., the plant would not be required to either reduce power or shutdown to test these valves at a later date unless the testing and analysis indicated the valve stroke time was not acceptable due to degradation). Finally, the testing is not impractical because these valves are equipped with remote position indication which would allow stroke-time testing to be performed in accordance with the Code requirements.

5.2.4 Conclusion

Relief is denied. The licensee must perform testing of the MSIVs in accordance with the Code requirements.

5.3 **Relief Request RR-V-3**

The licensee has requested relief from the power-operated valve stroke testing and stroke time acceptance criteria requirements of the ASME OM Code-1990, Paragraphs ISTC 4.2.4(a) and ISTC 4.2.8, for scram discharge volume vent and drain valves 1(2)C11-F010A&B, 1(2)C11-F011, 1(2)C11-F035A&B, and 1(2)C11-F037. The licensee has proposed to measure the response times of these valves as a group in accordance with the TS requirements.

5.3.1 Licensee's Basis for Requesting Relief

The licensee states:

> A limiting value of stroke time cannot be specified for the scram discharge volume vent and drain valves and they cannot be individually stroked and timed. In order to prevent water hammer induced damage to the system during a full CRD scram, plant Technical Specifications require that system valve operation is adjusted so that the outboard vent and drain valves (F035A&B, F037) fully close at least five seconds after each respective inboard vent and drain valve (F010A&B, F011). All valves must be fully closed in less than forty-five (45) seconds for Unit 1 and sixty (60) seconds for Unit 2. Additionally, the system is adjusted so that the inboard vent and drain valves (F010A&B, F011) start to open at least five seconds after each respective outboard vent and drain valve (F035A&B, F037) upon reset of a full core scram. The valves are not equipped with individual valve control switches and cannot be individually stroke timed. Because of the adjustable nature of the valve control system, individual valve stroke timing would not provide any meaningful information for monitoring valve degradation.
>
> System design prevents stroke timing these valves during normal operation without disabling the Reactor Protection System Scram Signal to the valves. Disabling this signal requires the installation of electrical jumpers and the opening of links in energized control circuits which increase the potential for a Reactor Scram.

5.3.2 Alternate Testing

The licensee proposes:

> The valves will be exercised quarterly but not timed. Additionally, the total valve sequence response time will be

verified to be less than Technical Specifications requirements during each refueling outage when a complete stroke time test is performed.

5.3.3 Evaluation

The Code requires that the limiting stroke time for power operated valves be specified by the licensee. The six scram discharge volume vent and drain valves in each of the Hatch units are not designed to be individually actuated and stroke timed. The valves are required by TS SR 3.1.8.3 to be closed within 45 seconds for Unit 1 and 60 seconds for Unit 2 upon receipt of an actuated or simulated scram signal at least once every 18 months. The TS Bases for SR 3.1.8.3 state that this surveillance requirement is an integrated test to verify total system performance. In addition, the testing frequency is based on the need to perform this surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. Requiring these valves to be stroke timed individually is impractical and a burden on the licensee because of the extensive modifications that would be required to the system to individually stroke the valves. In addition, jumpering the control circuit during plant operation to test these valves individually would be impractical because of the potential for a reactor scram.

The licensee has proposed to cycle these valves quarterly without performing a stroke-time test. The proposed testing provides a reasonable assurance of operational readiness because the valves will be exercised quarterly and the total valve response time will be tested each refueling outage.

5.3.4 Conclusion

Relief to exercise the scram discharge volume vent and drain valves is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

5.4 Relief Request RR-V-4

The licensee has requested relief from the exercise test frequency, power-operated valve stroke testing and stroke time acceptance criteria requirements of the ASME Code OM-1990, Paragraphs ISTC 4.2.1, ISTC 4.2.4(a) and ISTC 4.2.8, for the Unit 1 transverse incore probe (TIP) purge containment isolation valve 1C51-F3012. The licensee has proposed to exercise this valve quarterly without measuring stroke time, verify that the nitrogen flow in the associated tubing has stopped when the valve is stroked, and perform a local leak rate test in accordance with 10 CFR 50 Appendix J each refueling outage.

5.4.1 Licensee's Basis for Requesting Relief

The licensee states:

> The safety position of this valve is CLOSED to provide containment isolation which is initiated by a LOCA signal and results in isolation of TIP purge and the TIP probes. The Technical Specifications nor the FSAR have any specific requirements for isolation stroke time for this valve.
>
> This is a normally open, normally energized solenoid operated valve which strokes in milliseconds. The valve was not provided with remote indicating lights and its design does not provide for observation of actual stem movement.
>
> A simple check valve is located upstream of this solenoid valve which provides outboard containment isolation of the penetration. Nitrogen purge is at a steady flow and pressure which does not impose any harsh operating conditions on this check valve. Therefore, additional assurance is provided for isolation of the associated penetration.
>
> The purge line is small (3/8") and the FSAR evaluation indicates that even in the event of a TIP dry tube failure and non-isolation of the purge line, the radioactive release would remain within the allowable limits.
>
> Since this valve strokes in milliseconds, it is classified as a rapid acting valve per GL 89-04, Position 6. Therefore, if indicating lights or valve stem movement were observable, comparison time testing of valves with stroke times of less than or equal to 2 seconds is not required per ISTC 4.2.8(e).
>
> Industry history indicates that solenoid valves either operate properly or not at all. It has not been established that stroke time testing of solenoid valves provides data applicable for evaluation of degradation. The application of some type of electronic monitoring would be on a trial and error basis since no such equipment has been proven to provide useful test data to date. Considering the safety function of the valve (containment isolation) and the redundancy of this function provided by a simple check valve, stroke time testing to monitor degradation will not provide a significant increase in assurance that the valve is capable of performing its intended function.

5.4.2 Alternate Testing

The licensee proposes:

> The valve will be exercised closed quarterly, and observation of a decrease in nitrogen pressure in the associated tubing will be

utilized as confirmation that the valve is in the safety-related closed position.

This valve is exercised closed and local leak rate tested (LLRT) at each refueling outage in accordance with 10 CFR 50, Appendix J. LLRT provides assurance that the valve is in the closed position and thus is capable of providing its safety function of containment isolation.

5.4.3 Evaluation

The Code requires that Category A and B power operated valves be stroke time tested every three months. Since the licensee's proposed alternate testing indicates that this valve will be stroked every three months, the licensee is meeting the requirements of Paragraph ISTC 4.2.1 and relief is not necessary for this Code requirement. The Code also requires that power-operated valves shall be stroke-timed to at least the nearest second every three months. Since this a solenoid-operated valve, it is considered a rapid acting valve. GL 89-04, Position 6, allows licensees to establish limiting stroke-times for rapid acting valves at 2 seconds. In addition, ISTC 4.2.8(e) states that valves which stroke in less than 2 seconds are exempt from the corrective action requirements of ISTC 4.2.8(c) and ISTC 4.2.8(d). The requirements of ISTC 4.2.8(a) do not apply to rapid acting valves, therefore the licensee's request for relief from this Code requirement is not necessary.

The licensee has also requested relief from ISTC 4.2.4 which requires that the stroke-time of all power-operated valves shall be specified by the owner and measured to at least the nearest second. The licensee has proposed to exercise this valve quarterly without recording stroke time. These valves have neither position indication instrumentation installed to measure stroke times nor a visible valve stem to verify valve movement. Therefore, it is impractical for the licensee to test these valves in accordance with the Code stroke time test requirements. It would be a burden to require the licensee to modify these valves to measure stroke times.

NUREG-1482, Section 4.2.8, provides guidance to assess degradation in solenoid-operated valves which cannot be stroke-timed. The use of non-intrusive techniques or enhanced maintenance on the valves were cited as potential methods to assess degradation in solenoid-operated valves. In addition, in a SE dated June 13, 1994, the evaluation of relief requests RR-V-32 and RR-V-40 for the Units 1 and 2 TIP purge valves granted interim relief until the end of the second ten-year interval and concluded that the licensee should develop a method to determine degradation of these solenoid-operated valves or include the valves in an enhanced maintenance program.

The licensee has not addressed the interim relief request in their current submittal. In fact, the licensee's proposed alternate testing is the same as was proposed in the previous relief request. As stated in the previous evaluation, the valves would be verified closed by the cessation of nitrogen flow in the system. Exercising the solenoid-operated valves in accordance with the licensee's alternate testing would ensure that the valves are not bound and are capable of moving to their closed safety position. In addition, the LLRT will not provide any additional information to aid in the determination of SOV degradation other than verifying that the valve disc and seating surface have not been damaged.

The licensee's proposed alternative has not addressed the concerns raised in the June 13, 1994 evaluation and has not considered the guidance of NUREG-1482. Therefore, long term relief cannot be granted. An interim period should be given for the licensee to address these concerns and revise this relief request. The proposed alternative testing provides reasonable assurance of operational readiness during the interim period because the valves are exercised quarterly, demonstrating that the valves are not bound. Also, monitoring the nitrogen flow in the associated tubing indicates that the valves have closed.

5.4.4 Conclusion

Interim relief is granted from the Code power-operated valve stroke test requirements for the Unit 1 TIP purge containment isolation valve pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility. The relief is granted for an interim period of 60 days from the date of the SE to allow the licensee time to revise their relief request to address the concerns raised in the June 13, 1994 evaluation and incorporate any appropriate guidance provided in NUREG-1482.

5.5 Relief Request RR-V-5

The licensee has requested relief from the containment isolation valve requirements of ASME OM Code-1990, Paragraph ISTC 4.3.2, for TIP outboard containment isolation shear valves 1(2)C51-Shear A-D. The licensee has proposed to allow the manufacturer to leak test a sample lot of valves prior to delivery.

5.5.1 Licensee's Basis for Requesting Relief

The licensee states:

> These valves are explosive actuated shear valves. The shear valve isolates the TIP tubing by shearing the tube and TIP drive cable, and by jamming the sheared ends of the tubing into a teflon coating on the shear valve disc. Thus the shear valves cannot be local leak rate tested without destroying the drive tube.

5.5.2 Alternate Testing

The licensee proposes:

> Each lot of shear valves is sample leakage tested by the manufacturer prior to delivery. This sample leak rate testing satisfies the requirements of the Plant Hatch 10 CFR 50, Appendix J Leakrate Program.
>
> These valves are also tested in accordance with ISTC 4.6 as explosive actuated valves.

5.5.3 Evaluation

Each TIP drive mechanism has a shear valve located between the mechanism and a ball valve in the guide tube to provide outboard isolation of the guide tube in the event that containment isolation is required. When the TIP is beyond the ball valve, which is normally used to provide outboard isolation, and power to the TIP system has failed, the shear valve is actuated manually from the control room. This action actuates the shear valve detonation squib which shears the guide tube and drive cable and isolates the guide tube.

Valves which are classified as Category A are required to be leak tested in accordance with the Code requirements. Upon actuation, the subject valves shear the guide tube in order to achieve containment isolation. Requiring the licensee to actuate the TIP shear valves to conduct leak rate testing would be impractical and a burden on the licensee because the shear valve would have to be replaced and the associated guide tube and drive cable repaired after each test.

The licensee has proposed to use the manufacturer's leak rate testing to satisfy the Code requirements. The licensee stated that the sample leak rate testing performed by the manufacturer satisfies the Hatch 10 CFR 50, Appendix J leak rate program. The proposed testing provides a reasonable assurance of operational readiness because the manufacturer's testing is conducted on each shear valve and this testing meets the requirements of Appendix J. The leak testing requirements of Appendix J provide an adequate assessment of leaktightness for containment isolation valves.

5.5.4 Conclusion

Relief is granted from the containment isolation valve testing requirements for the TIP outboard containment isolation shear valves pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

5.6 **Relief Request RR-V-6**

The licensee has requested relief from the exercising test frequency and exercise requirements of ASME OM Code-1990, Paragraphs ISTC 4.5.1 and 4.5.2, for the Unit 1 RHR low pressure coolant injection (LPCI) injection check valves 1E11-F050A&B. The licensee has proposed to partial-flow test at least one of the two check valves every cold shutdown. In addition, the licensee has proposed to perform mechanical exercising of both valves in accordance with Paragraph ISTC 4.5.4(b) every refueling outage.

5.6.1 Licensee's Basis for Requesting Relief

The licensee states:

> The plant and system configuration does not provide for full- or partial-flow exercising during normal operation. LPCI injection during normal operation is impossible because reactor pressure is significantly greater than LPCI injection pressure. Therefore full or partial exercising with flow is impossible quarterly.
>
> During operation in the cold shutdown mode, it has been determined that the subject valve for the loop in operation is only partially stroked to the open position. To fully open the valve in this mode would require the use of two RHR pumps in combination; however, net positive suction head requirements would not be met in this alignment.
>
> The only way to full-flow exercise these valves would be to align the RHR pump suction to the suppression pool and inject to the RPV at cold shutdown or refueling outage. This would result in a significant degradation of reactor coolant quality which would require an extensive amount of time to restore the Technical Specification required coolant quality. Therefore full flow exercising at cold shutdown or refueling is impractical.
>
> It is normal plant practice to utilize only one loop of RHR in shutdown cooling for any unscheduled shutdown due to the efforts involved in system alignment, flushing, pipe warm-up and swapping of loops. Requiring both loops of RHR shutdown cooling to be placed in operation during an unplanned shutdown for the sole purpose of exercising each check valve places undue hardship on operation's personnel involved with other shutdown activities and could extend shutdown duration. Therefore partial exercising each valve with RHR shutdown cooling flow during each cold shutdown is impractical.
>
> These valves are located inside the primary containment and are therefore inaccessible during normal operation or at cold shutdown unless the containment is de-inerted. The containment is never de-inerted during an unplanned shutdown unless containment entry

is absolutely necessary. Therefore mechanical exercising quarterly or at cold shutdown is impractical.

5.6.2 Alternate Testing

The licensee proposes:

The loop of RHR utilized for shutdown cooling will be alternated each shutdown. Therefore one of these valves will be partial exercised each cold shutdown and valves will be alternated for each shutdown.

During each refueling outage, both loops of RHR shutdown cooling are utilized in support of normal shutdown and fuel handling activities. Therefore each check valve will be partially exercised at each refueling outage.

Additionally, each valve will be mechanically exercised in accordance with ISTC 4.5.4(b) at each refueling outage. Partial exercising with flow at the described frequency along with mechanical exercising and leak rate testing during each refueling outage provides sufficient confirmation of valve operability.

5.6.3 Evaluation

The Code requires that the Unit 2 LPCI injection check valves be exercised to their safety position once every three months to monitor for degradation. These valves have a safety function in the open direction in the LPCI mode of RHR to allow flow into the reactor vessel in the event of an accident. In addition, these valves are located inside containment and are not accessible during power operation and cold shutdowns when the containment is inerted. These valves cannot be exercised during power operation because reactor pressure is greater than LPCI injection pressure. Currently during cold shutdowns, one of the two check valves is partial-stroke exercised as a result of RHR operation during shutdown cooling operations.

ISTC 4.5.2(d) states that if exercising is not practicable during plant operation and full-stroke operation is not practicable during cold shutdowns, exercising may be limited to partial-stroke testing during cold shutdowns and full-stroke exercising during refueling outages. The licensee's alternate testing meets the conditions in this paragraph. In addition, mechanical exercising of both valves in accordance with Paragraph ISTC 4.5.4(b) every refueling outage is acceptable provided that the licensee has justification to defer testing to refueling outages. Relief from the Code requirements of Paragraphs ISTC 4.5.1 and 4.5.2 is not necessary.

5.6.4 Conclusion

Relief is not required. The licensee should replace this relief request with a refueling outage justification.

5.7 Relief Request RR-V-7

The licensee has requested relief from the exercising test frequency and exercising requirements of ASME OM Code-1990, Paragraphs ISTC 4.5.1 and ISTC 4.5.2, for the Units 1 and 2 HPCI suppression pool pump suction check valves 1(2)E41-F045. The licensee has proposed to disassemble and inspect the valves every second refueling outage.

5.7.1 Licensee's Basis for Requesting Relief

The licensee states:

> This normally closed check valve is located on the HPCI pump suction line from the suppression pool. The valve does not experience flow during any normal mode of reactor operation or shutdown conditions or during HPCI pump surveillance testing. The normal suction source for the HPCI pump is the condensate storage tank (CST) for periodic surveillance testing and ECCS injection. The pump suction transfers to the suppression pool upon indication of a low water level in the CST which would only occur during an extended HPCI injection because 100,000 gallons of water are always maintained in the CST for ECCS usage.
>
> Forward flow exercising this valve would require aligning the HPCI pump suction to the suppression pool and discharging to the CST. This flow path would significantly degrade the water quality in the CST.

5.7.2 Alternate Testing

The licensee proposes:

> Every second refueling outage the valve will be disassembled, manually exercised and visually inspected to confirm that the valve is capable of full stroking and that its internals are structurally sound (no loose or excessively corroded parts). This frequency is considered adequate to detect degradation which would prevent the valve from meeting its safety function. The valve remains in the closed position in a torus water environment and does not experience flow which could cause wear. Additionally, past inspections have shown little, if any, degradation other than the expected minor corrosion.
>
> Generic Letter 89-04 requires that a partial flow test be performed on check valves that are disassembled prior to their return to service. There is no possible flow path available for partial flow testing this check valve that would not introduce suppression pool water into the HPCI system piping or back to the CST. This is a simple swing check valve (Powell Fig. 1561-WE) which does not require removal of the valve internals to perform a manual stroke test or visual inspection. Even if

exercising/inspection resulted in valve repairs, the valve could still be manually stroked after the internals were reinstalled in the valve. Therefore, full stroke capability of the valve is ensured prior to installation of the bonnet cover.

This relief request is required because all of the requirements (partial exercise after reassembly and frequency of disassembly) of GL 89-04, Position 2, are not practicable.

5.7.3 Evaluation

The guidance in GL 89-04, Position 2, allows licensees to establish sample disassembly and inspection programs for valves which cannot be verified to full-stroke open or closed with flow as required by the Code. If the guidance is used, the valves in each group must be of the same design (manufacturer, size, model number and materials of construction) and must also be exposed to the same service conditions. Where possible, a partial stroke exercise with flow should be performed after the valve is reassembled.

NUREG-1482, Section 4.1, provides supplemental guidance on the inservice testing of check valves. In this section, it is stated that grouping of valves in multiple units is permissible if the units are "identical" and the grouped valves have similar operational experience and otherwise meet the grouping criteria. Further guidance is provided in the comments to NUREG-1482 on page G-29, where in response 4.1-3 it is stated that if a generic problem is found while disassembling and inspecting valves during a refueling outage on one unit, all valves in the group in that unit must be inspected during the refueling outage, and the valves in the group in the other unit must be inspected at the next refueling outage.

It appears that the licensee's proposed inspection for the HPCI check valves conforms with the guidance in GL 89-04, Position 2, and the supplemental guidance in NUREG-1482. However, the licensee's stated inspection frequency (inspect the valve every other refueling outage) is not clear. It appears that each HPCI suction check valves (one valve from each unit) are considered a group of two with one valve in the group tested every refueling outage. This grouping and frequency of check valve inspection are in accordance with the guidance of GL 89-04, Position 2, and the supplemental guidance provided in NUREG-1482.

5.7.4 Conclusion

The licensee should clarify the testing and inspection plan for these valves. If clarified as discussed above, a specific request for relief is not required. In addition, the licensee should document the inspection of these check valves in their IST program as appropriate in its response to this SE.

5.8 Relief Request RR-V-8

The licensee has requested relief from the valve obturator movement observation requirements of ASME OM Code-1990, Paragraph ISTC 4.2.3, for the air-operated equipment cooling water supply valves listed below. The licensee has proposed to stroke-time these valves by observing actual valve stem movement.

1(2)P41-F035A&B	1(2)P41-F036A&B	1(2)P41-F037A-D
1(2)P41 F039A&B	2P41-F340	2P41-F339A&B

5.8.1 Licensee's Basis for Requesting Relief

The licensee states:

> These valves are normally closed, fail-open air operated valves which have a safety function to open and provide cooling-water flow to the associated safety related equipment. System design did not provide indicating lights, instrumentation or direct valve control switches.
>
> The valves receive an open signal upon initiation of the associated equipment and a close signal upon termination of operation of the associated equipment. Therefore, verification of obturator movement and measurement of valve stroke time and can only be performed by observation of the actual valve stem movement when the associated equipment is placed into service.

5.8.2 Alternate Testing

The licensee proposes:

> Verification of obturator movement and measurement of valve stroke time will be performed by observing actual valve stem movement. Stroke time will be considered to be the time from start to stop of valve stem movement. The requirements of ISTC 4.2.8 will be applied to monitor valve degradation.

5.8.3 Evaluation

The equipment cooling water supply valves are air-operated valves which have a safety function to open. The Code requires that stroke timing of Category B valves be measured from the initiation of the actuation cycle to the completion of the actuation cycle. The Code requirements are impractical because these valves are not equipped with any type of position indication instrumentation that would facilitate timing the valves in accordance with the Code requirements. Imposition of the Code requirements would be a burden because new valves equipped with position indication or instrumentation would have to be procured and installed.

Typically, valves with position indication are timed by an operator using a stopwatch. The operator times the valve stroke time interval based on position lights in the control room. The licensee has proposed to measure the stroke-time of these valves from the time the valve stem starts to move until the stem stops moving. Switch-to-light timing involves visual observation and therefore has the same potential inaccuracy as the licensee's proposed method. However, switch-to-light timing provides electronic verification of full valve travel. The licensee has not proposed any method to verify that the valve has traveled to its full-stroke position or, as a minimum, to a repeatable position.

This relief request applies to the same valves as relief request RR-V-20 which was submitted in the second ten-year interval by the licensee to request relief from the ASME Section XI Code exercise procedure requirements for these valves. The request was granted in a SE dated June 13, 1994, with the provision that the licensee develop some means to verify the full-stroke travel or repeatability of these valves. Since the licensee has not referenced any methods to verify full-stroke travel of these valves in relief request RR-V-8, the extent of the implementation of the alternate requirements imposed by the NRC in the provisional approval of relief request RR-V-20 in the June 13, 1994, SE is unknown.

As stated in the June 13, 1994, SE, the licensee should develop a means to verify full-stroke travel of the valve or to mark the stroke position on the valve for repeatability, ensuring that the point is acceptable for the safety function. The proposed alternate testing, with verification of full-stroke travel, provides a reasonable assurance of operational readiness because the actual stroke time of the valve movement is being measured in a repeatable manner. The licensee should revise this relief request to include the methods that are employed to verify the full-stroke exercise of these valves.

5.8.4 Conclusion

Interim relief to stroke time the equipment cooling water supply air-operated valves by observation of stem movement is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility. The relief is granted for an interim period of 60 days from the date of the SE to allow the licensee time to revise their relief request to include the methods used in implementing the provisions imposed in the evaluation of relief request RR-V-20 contained in the SE for the Hatch second ten-year program dated June 13, 1994.

5.9 Relief Request RR-V-9

The licensee has requested relief from the exercise test frequency, power-operated valve stroke testing and stroke time acceptance criteria requirements of the ASME Code OM-1990, Paragraphs ISTC 4.2.1, ISTC 4.2.4(a) and ISTC 4.2.8, for the Unit 2 transverse incore probe (TIP) purge containment isolation valve

2C51-F3012. The licensee has proposed to exercise this valve quarterly without measuring stroke time, verify that the nitrogen flow in the associated tubing has stopped when the valve is stroked, and perform a local leak rate test in accordance with 10 CFR 50 Appendix J each refueling outage.

5.9.1 <u>Licensee's Basis for Requesting Relief</u>

The licensee states:

> The safety position of this valve is CLOSED to provide containment isolation which is initiated by a LOCA signal and results in isolation of TIP purge and the TIP probes. Neither the Technical Specifications [n]or the FSAR have any specific requirements for isolation stroke time for this valve.
>
> This is a normally open, normally energized solenoid operated valve which strokes in milliseconds. The valve was not provided with remote indicating lights and its design does not provide for observation of actual stem movement (stem is fully enclosed).
>
> A simple check valve is located upstream of this solenoid valve which provides outboard containment isolation of the penetration. Nitrogen purge is at a steady flow and pressure which does not impose any harsh operating conditions on this check valve. Therefore, this upstream check valve provides additional assurance for isolation of the associated penetration.
>
> The purge line is small (3/8") and the FSAR evaluation indicates that even in the event of a TIP dry tube failure and non-isolation of the purge line, the radioactive release would remain within the allowable limits.
>
> Since this valve strokes in milliseconds, it is classified as a rapid acting valve per GL 89-04, Position 6. Therefore, if indicating lights or valve stem movement were observable, comparison time testing of valves with stroke times of less than or equal to 2 seconds is not required.
>
> Industry history indicates that solenoid valves either operate properly or not at all. It has not been established that stroke time testing of solenoid valves provides data applicable for evaluation of degradation. The application of some type of electronic monitoring would be on a trial and error basis since no such equipment has been proven to provide useful test data to date. Considering the safety function of the valve (containment isolation only) and the redundancy of this function provided by a simple check valve, testing to monitor degradation will not provide a significant increase in assurance that the valve is capable of performing its intended function.

5.9.2 Alternate Testing

The licensee proposes:

> This valve will be exercised closed quarterly, and observation that nitrogen flow in the associated tubing has stopped will be utilized as confirmation that the valve is in the safety related closed position.
>
> This valve is local leak rate tested (LLRT) at each refueling outage in accordance with 10 CFR 50, Appendix J. [The] LLRT provides assurance that the valve is in the closed position and thus is capable of providing its safety function of containment isolation.

5.9.3 Evaluation

The Code requires that power operated valves which are either Category A or B be stroke time tested every three months. Since the licensee's proposed alternate testing indicates that this valve will be stroked every three months, the licensee is meeting the requirements of Paragraph ISTC 4.2.1 and relief is not necessary for this Code requirement. The Code also requires that power-operated valves shall be stroke-timed to at least the nearest second every three months. Since this a solenoid-operated valve, it is considered a rapid acting valve. GL 89-04, Position 6, allows licensees to establish limiting stroke-times for rapid acting valves at 2 seconds. In addition, ISTC 4.2.8(e) states that valves which stroke in less than 2 seconds are exempt from the corrective action requirements of ISTC 4.2.8(c) and ISTC 4.2.8(d). The requirements of ISTC 4.2.8(a) do not apply to rapid acting valves, therefore the licensee's request for relief from this Code requirement is not necessary.

The licensee has also requested relief from ISTC 4.2.4 which requires that the stroke-time of all power-operated valves shall be specified by the owner and measured to at least the nearest second. The licensee has proposed to exercise this valve quarterly without recording stroke time. These valves have neither position indication instrumentation installed to measure stroke times nor a visible valve stem to verify valve movement. Therefore, it is impractical for the licensee to test these valves in accordance with the Code stroke time test requirements. It would be a burden to require the licensee to modify these valves to measure stroke times.

NUREG-1482, Section 4.2.8, provides guidance to assess degradation in solenoid-operated valves which cannot be stroke-timed. The use of non-intrusive techniques or enhanced maintenance on the valves were cited as potential methods to asses degradation in solenoid-operated valves. In addition, in an SE dated June 13, 1994, the evaluation of relief requests RR-V-32 and RR-V-40 for the Units 1 and 2 TIP purge valves granted interim relief until the end of the second ten-year interval and concluded that the licensee should develop a method to determine degradation of these solenoid-operated valves or include the valves in an enhanced maintenance program.

The licensee has not addressed the interim relief request in their current submittal. In fact, the licensee's proposed alternate testing is the same as was proposed in the previous relief request. As stated in the previous evaluation, the valves would be verified closed by the cessation of nitrogen flow in the system. Exercising the solenoid-operated valves in accordance with the licensee's alternate testing would ensure that the valves are not bound and are capable of moving to their closed safety position. In addition, the LLRT will not provide any additional information to aid in the determination of SOV degradation other than verifying that the valve disc and seating surface have not been damaged.

The licensee's proposed alternative has not addressed the concerns raised in the June 13, 1994 evaluation and has not considered the guidance of NUREG-1482. Therefore, long term relief cannot be granted. An interim period should be given for the licensee to address these concerns and revise this relief request. The proposed alternative testing provides reasonable assurance of operational readiness during the interim period because the valves are exercised quarterly, demonstrating that the valves are not bound. Also, monitoring the nitrogen flow in the associated tubing indicates that the valves have closed.

5.9.4 Conclusion

Interim relief is granted from the Code power-operated valve stroke test requirements for the Unit 2 TIP purge containment isolation valve pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code requirements, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility. The relief is granted for an interim period of 60 days from the date of the SE to allow the licensee time to revise their relief request to address the concerns raised in the June 13, 1994 evaluation and incorporate any appropriate guidance provided in NUREG-1482.

5.10 Relief Request RR-V-10

The licensee has requested relief from the exercising test frequency and exercise requirements of ASME OM Code-1990, Paragraphs ISTC 4.5.1 and 4.5.2, for the Unit 2 RHR LPCI check valves 2E11-F050A&B. The licensee has proposed to partial-flow test at least one of the two check valves every cold shutdown. In addition, the licensee has proposed to either verify each valve full-stroke opens by means of local position indication or full-stroke exercise the valves by some other means on a refueling outage frequency.

5.10.1 Licensee's Basis for Requesting Relief

The licensee states:

> The plant and RHR system configuration does not provide for full- or partial-flow exercising during normal operation. LPCI injection during normal operation is impossible because reactor

pressure is significantly greater than LPCI injection pressure. Therefore, full or partial exercising with flow quarterly is impossible.

During the shutdown cooling mode of RHR operation, the normal flow rate is between 7700 and 8200 gpm. At 7700 gpm the flow velocity is approximately 14 fps [feet per second]. Valve vendor information indicates that a flow velocity of ≥10 fps is sufficient to fully open the valve disk if the valve is in good operating condition. Therefore, normal shutdown cooling flow rates are sufficient to fully open the disk of a valve in good operating condition.

Valve design incorporates a two piece (outside hollow cylinder and inside solid cylinder) hinge pin because the valve was initially provided with an operator which was used to minimally exercise the valve disk. The operator is no longer utilized for disk exercising, but the two piece hinge pin allows for external visual determination of the disk position by observing the inside hinge pin position.

It is normal plant practice to utilize only one loop of RHR in shutdown cooling for any unscheduled shutdown due to the extra efforts involved in system alignment, flushing, pipe warm-up and swapping of loops. To require both loops of RHR shutdown cooling to be placed in operation during an unplanned shutdown for the sole purpose of exercising each check valve seems unwarranted. Therefore, exercising both valves at each shutdown is impractical.

5.10.2 Alternate Testing

The licensee proposes:

At least one of these check valves receives shutdown cooling flow (7700 - 8200 gpm), therefore is at least partially exercised, each cold shutdown. The loop of RHR shutdown cooling placed into service will be alternated for each unplanned shutdown. Therefore, a different valve will be at least partially exercised each time shutdown cooling is utilized.

During each refueling outage, both loops of RHR shutdown cooling are utilized in support of normal shutdown and fuel handling activities. Therefore both valves are exercised during each refueling outage.

In conjunction with RHR shutdown cooling operation each refueling outage, external visual observation of rotation of the inside hinge pin will be utilized to confirm that the valve disk is fully open. Scribe marks, angular measurements or some other positive means will be used to ensure that the flow actually moves the valve disk to the full open position. If visual observation does not confirm that the flow has fully exercised the valve disk, then appropriate additional actions will be taken (e.g. mechanically exercising the valve per ISTC-4.5.4(b), disassemble, exercise and visually inspect, etc.).

5.10.3 Evaluation

The Code requires that the Unit 2 LPCI injection check valves be exercised to their safety position once every three months to monitor for degradation. These valves have a safety function in the open direction in the LPCI mode of RHR to allow flow into the reactor vessel in the event of an accident. In addition, these valves are located inside containment and are not accessible during power operation and cold shutdowns when the containment is inerted. These valves cannot be exercised during power operation because reactor pressure is greater than LPCI injection pressure. Currently during cold shutdowns, one of the two check valves is partial-stroke exercised as a result of RHR operation during shutdown cooling operations. Although the licensee states that the shutdown cooling flow will fully stroked open the check valve, credit for only a partial-stroke test can be taken because the flow is less than design basis flow and the check valve is not verified to travel to the full open position by the use of non-intrusive means.

ISTC 4.5.2(d) states that if exercising is not practicable during plant operation and full-stroke operation is not practicable during cold shutdowns, exercising may be limited to partial-stroke testing during cold shutdowns and full-stroke exercising during refueling outages. The licensee's alternate testing meets the conditions in this paragraph. In addition, use of a position indicating device, such as observation of the hinge pin to rotate from the closed position permanently marked on the outside hollow cylinder of this particular valve, meets the valve obturator movement requirements of ISTC 4.5.4. Relief from the Code requirements of Paragraphs ISTC 4.5.1 and 4.5.2 is not necessary. The licensee should write a refueling outage justification to replace this relief request.

The licensee's alternate method of testing implies that local valve position indication will be used to determine the disc position during refueling outages. In addition, other options, such as mechanically exercising the valve and disassembly and inspection, are given as possible methods of testing or inspection if the local position indication fails to confirm that the disc has been fully exercised. This information is identical to the information provided in the licensee's submittal of relief request RR-V-14 which was evaluated in the June 13, 1994, SE. Since Hatch Unit 2 had a refueling outage in the fall of 1995, the licensee has been able to use one of the methods described in their alternate testing to verify that the valves are full-stroke exercised on a refueling outage frequency. The licensee should document in their refueling outage justification which testing method is being used. The licensee should not use any method that has not been previously qualified with the exception of inspection in accordance with GL 89-04, Position 2. The testing procedures should reflect the method that is being used to test these valves.

5.10.4 Conclusion

Relief is not required. The licensee should replace this relief request with a refueling outage justification and document the method that these valves are being verified to full-stroke open and ensure that their testing procedures are consistent with this method.

6.0 REVIEW OF IST PROGRAM SCOPE

An IST program scope review was performed on the Hatch HPCI, RHR, RHRSW and core spray systems. System P&IDs were reviewed and valves determined to have safety functions were compared to the licensee's IST program listing for the respective systems. Individual valve testing and safety attributes proposed by the IST program were also reviewed for consistency with applicable codes and regulatory guidance. As a result of this review, the staff determined that certain components and component safety functions may have been omitted from the scope of the licensee's IST program. The licensee should review the following components identified by the staff against the requirements of ISTC 1.1 and revise their IST program as necessary.

6.1 HPCI System

6.1.1 HPCI Turbine's Barometric Condenser Relief Valves

Relief valves 1(2)E41-F018 of the HPCI system are not included in the IST program. It appears that these relief valves may have a safety function in protecting the HPCI system in accordance with the scope requirements of Paragraph ISTC 1.1.

6.1.2 Barometric Condenser Pump Discharge Check Valve

Valves 1(2)E41-F052 are only tested in the closed position. Failure of these valves to open could result in the inability to control barometric condenser level. Therefore, it appears that these check valves have a safety function in the open position in accordance with the scope requirements of Paragraph ISTC 1.1.

6.1.3 Inboard and Outboard Torus Vacuum Relief CIVs

Valves 1(2)E41-F104 and 1(2)E41-111 are included in the IST program with a safety position of closed. However, a review of the system P&IDs indicated that if for any reason these valves were in the closed position when a vacuum is developed in the turbine exhaust line, the valves will then be required to open. Therefore, it appears that these valves have safety positions of open and closed in accordance with the scope requirements of Paragraph ISTC 1.1.

6.2 RHR System

6.2.1 RHR Shutdown Cooling Isolation

Valves 1(2)E11-F006A-D are identified with a safety position of open. These valves may be required to close if the suction of one RHR pump is to be isolated from the suction of the other RHR pump (in the same train) during the SDC mode of the system. If this system configuration is, in fact, a valid one at Hatch, then these valves should have safety positions of open and closed.

6.2.2 Heat Exchanger Shell Side Outlet

Valves 1(2)E11-F003A&B and 1(2)E11-F047A&B are identified with a safety position of open. Should the plant require LPCI injection in a configuration which bypasses the RHR heat exchanger, these valves would be required to close. If this system configuration is, in fact, a valid one at Hatch, then these valves should have safety positions of open and closed.

6.3 RHRSW System

6.3.1 Unit 2 Cross-Tie Valves

Motor-operated valves 1(2)E11-F119A&B, which serve as cross-tie isolation valves between the two trains of RHRSW on Units 1 and 2, are not included in the Hatch IST program. NUREG-1482, Table 2.2, lists cross-tie valves in BWR service water systems as valves with safety functions that are frequently omitted from IST programs. Their safety functions would be to open to allow cross-tie of the two trains of RHRSW and to close to isolate the trains from each other.

7.0 ANOMALIES

The following anomalies were noted during the course of the IST program review. The licensee should review these items and make changes to their IST program, testing procedures, or other plant documentation as necessary. Items which require a response to the NRC should be completed within one year or the next refueling outage, whichever is longer, unless otherwise stated. Relief requests determined to be required as a result of this review should be submitted for NRC evaluation prior to the next scheduled testing. Proposed alternatives cannot be implemented without prior NRC approval.

7.1 RR-P-9 (SE Section 4.9)

Relief was denied to establish a general absolute alert vibration limit for pumps in which the licensee classified as "smooth running" because of a recent event at a plant with a similarly classified pump and current lack of consensus among industry representatives on this issue. If the licensee has specific pumps that fall within the scope of their proposed relief request, and their testing methodology will allow detection of pump degradation at the absolute vibration limits proposed in their relief request, then the licensee may submit separate relief requests for each applicable pump.

7.2 RR-V-2 (SE Section 5.2)

Relief was denied to use the upper and lower limiting stroke time specified in the licensee's TS to determine the stroke time acceptance criteria instead of the 50 percent increase in the stroke time reference value required by the Code for the MSIVs 1(2)B21-F022A-D and 1(2)B21-F028A-D. The updated Code corrective action requirements are enhancements to the Code and would not be implemented with the licensee's proposed relief request; therefore, the proposed testing is not equivalent to the Code and does not provide an acceptable level of safety. In addition, the licensee did not demonstrate the hardship or impracticality of performing the required testing in accordance with the Code. Therefore, the licensee must perform testing of the MSIVs in accordance with the Code requirements.

7.3 RR-V-4 and RR-V-9 (SE Sections 5.4 and 5.9)

Interim relief was granted from the Code power-operated valve stroke test requirements for the Units 1 and 2 TIP purge containment isolation valves 1(2)C51-F3012. The licensee has not addressed the concerns stated in the interim relief request granted by the NRC in a SE dated June 13, 1994, in their current submittal which concluded that the licensee should develop a method to determine degradation of these solenoid-operated valves or include the valves in an enhanced maintenance program. The current relief requests are granted for an interim period of 60 days from the date of the SE to allow the licensee time to revise their relief request to address the concerns raised in the June 13, 1994 evaluation and incorporate any appropriate guidance provided in NUREG-1482.

7.4 RR-V-6 and RR-V-10 (SE Sections 5.6 and 5.10)

Relief from the Code requirements of Paragraphs ISTC 4.5.1 and 4.5.2 for the Units 1 and 2 LPCI injection check valves 1(2)E11-F050A&B is not necessary because the licensee's alternate testing meets the requirements of the Code. The licensee should replace these relief requests with refueling outage justifications.

7.5 RR-V-8 (SE Section 5.8)

This relief request applies to the same valves as relief request RR-V-20 which was submitted in the second ten-year interval to request relief from the ASME Section XI Code exercise procedure requirements for these valves. The request was granted with the provision that the licensee develop some means to verify the full-stroke travel or repeatability of these valves. Since the licensee has not referenced any methods to verify full-stroke travel of these valves in relief request RR-V-8, the extent of the implementation of the alternate requirements imposed by the NRC in the provisional approval of relief request RR-V-20 is unknown. Relief to stroke time the equipment cooling water supply air-operated valves by observation of stem movement is granted for an interim period of 60 days from the date of the SE to allow the licensee time to revise their relief request to include the methods used in implementing the provisions imposed in the evaluation of relief request RR-V-20 contained in the SE for the Hatch second ten-year program dated June 13, 1994.

7.6 ROJ-V-2 (SE Section 2.1)

Relief is required from the power-operated valve stroke testing requirements of Paragraph ISTC 4.2.4 for the nuclear boiler system main steam over-pressure protection automatic de-pressurization relief valves because the test methods employed by the licensee differed from the Code requirements. Since sufficient information was provided to evaluate this as a relief request, an evaluation was performed. Relief was approved with the provision that exercising of the valves be conducted during the initial startup after refueling outage to ensure that the valves have been properly reassembled.

7.7 ROJ-V-25

The licensee should revise this ROJ to include justification for not performing the Code testing for both the open and closed safety function of the HPCI steam exhaust line vacuum breakers 1(2)E41-F102 and 1(2)E41-F103. In addition, the testing used to verify the open safety function appears to test both check valves in series when there are test connections available to facilitate individual valve testing. The licensee should review their current testing methodology to determine if these valves can be individually tested.

7.8 Pump Note 6 (SE Section 2.2.1)

The RCIC system is within the licensing basis of Hatch because specific components in the system 1) have a required safety function to bring the reactor to the cold shutdown condition as specified in scope statements of ASME OM Code-1990, Paragraphs ISTB 1.1 and ISTC 1.1; 2) meet the requirements of Regulatory Guide 1.26; 3) are classified as Quality Group Classification A and B which correspond to ASME Safety Class 1 and 2 respectively; and 4) are required to be operable in the plant TS. The RCIC pump and applicable system valves should be included within the scope of the licensee's IST program. The licensee should revise their IST program as appropriate and begin testing the applicable components in accordance with the Code requirements.

7.9 Pump Note 7 (SE Section 2.2.2)

The licensee must submit a relief request to use the proposed alternate testing described for the six diesel fuel oil transfer pumps because the proposed method is not in accordance with the Code and is not discussed in any prior staff guidance.

7.10 Valve Note 11 (SE Section 2.3.1)

It appears that the licensee is crediting the quarterly exercise requirement of the maintain RHR water level stop check valves (1E11-F126A&B and 2E11-F124A&B) and the maintain core spray water level stop check valves (1(2)E21-F040A&B) by using the manual hand wheel to exercise each valve. Each valve listed is in series with another check valve with no intermediate test connections to facilitate back flow testing. If prompt closure of these check valves on cessation or reversal of flow is required to accomplish their safety function, closure must be verified by either reverse flow testing or other positive means. Section 4.1.1 of NUREG-1482 states that if only one valve of the in series check valves is credited in the safety analysis, then verification that the pair of valves is capable of closing is acceptable for IST. The licensee should review the guidance provided in NUREG-1482 and revise their IST program accordingly.

7.11 Valve Notes 7 and 12 (SE Section 2.3.2)

It is not clear whether during testing of the core spray pump discharge check valves 1(2)E21-F003A&B, which have safety functions in both the open and closed directions, these valves are exercised to the open position and then verified closed as specified in the guidance provided in NUREG-1482, Question Group 24. The licensee should review the testing of these valves and revise their IST program as necessary.

7.12 Valve Note 13 (SE Section 2.3.3)

The licensee should review the scope of this note to determine if it also applies to RHR minimum flow line valves 1E11-F046C & D and 2E11-F046A-D and revise their IST program as necessary.

7.13 Valve Note 22 (SE Section 2.3.4)

The licensee states that forward flow operability of the service water motor cooling water check valves (1P41-F438A&B and 2P41-F306A&B) will be verified quarterly during pump testing by observation of free flow through the sight glass located downstream of the check valves. This testing verifies that some flow is achieved through the valve but does not demonstrate whether the valve is capable of passing the maximum required accident condition flow. The licensee should revise the testing of this valve to provide quantifiable acceptance criteria that will monitor for degradation in accordance with Code requirements.

7.14 Valve Notes 16, 17, 19 and 20 (SE Section 2.3.5)

These notes are related to valves in the RCIC system. Section 2.2.1 of this SE concluded that the RCIC system should be included within the scope of the Hatch IST program. Therefore, the licensee should reconsider the actions described in these notes and revise their IST program accordingly.

7.15 RR-P-10 (SE Section 4.10)

The proposed alternative to the Code vibration alert range limits of Table ISTB 5.2-2b for the HPCI pump is authorized with the provision that the alternative only applies to the vertical direction of the inner main pump bearing. All other directions will continue to be subject to the vibration limits specified in Table ISTB 5.2-2b. The licensee should revise their IST program and test procedures to reflect the elements of the provisional relief.

7.16 HPCI System Scope

7.16.1 Valves 1(2)E41-F018 (SE Section 6.1.1)

Relief valves 1(2)E41-F018 are not included in the IST program and may have a safety function in protecting the HPCI system in accordance with the scope requirements of Paragraph ISTC 1.1. The licensee should evaluate these relief valves for inclusion in their IST program and revise their program as applicable.

7.16.2 Valves 1(2)E41-F052 (SE Section 6.1.2)

Valves 1(2)E41-F052 are only tested in the closed position. Failure of these valves to open could result in the incapability to control barometric condenser level. Therefore, it appears that these check valves have a safety function in the open position in accordance with the scope requirements of Paragraph ISTC 1.1. The licensee should evaluate the open safety function of these check valves for inclusion in their IST program and revise their program as applicable.

7.16.3 Valves 1(2)E41-F104 and 1(2)E41-F111 (SE Section 6.1.3)

Valves 1(2)E41-F104 and 1(2)E41-F111 are included in the IST program with a safety position of closed. However, a review of the system P&IDs indicated that if for any reason these valves were in the closed position when a vacuum is developed in the turbine exhaust line, the valves will then be required to open. Therefore, it appears that these valves have safety positions of open and closed in accordance with the scope requirements of Paragraph ISTC 1.1.

The licensee should evaluate the open safety function of these check valves for inclusion in their IST program and revise their program as applicable.

7.17 RHR and RHRSW System Scope

7.17.1 Valves 1(2)E11-F006A-D (SE Section 6.2.1)

Valves 1(2)E11-F006A-D are identified with a safety position of open. These valves may be required to close if the suction of one RHR pump is to be isolated from the suction of the other RHR pump (in the same train) during the SDC mode of the system. If this system configuration is, in fact, a valid one at Hatch, then these valves should have safety positions of open and closed. The licensee should evaluate the closed safety function of these valves in their IST program and revise their program as applicable.

7.17.2 Valves 1(2)E11-F003A&B and 1(2)E11-F047A&B (SE Section 6.2.2)

Valves 1(2)E11-F003A&B and 1(2)E11-F047A&B are identified with a safety position of open. Should the plant require LPCI injection in a configuration which bypasses the RHR heat exchanger, these valves would be required to close. If this system configuration is, in fact, a valid one at Hatch, then it would appear that these valves should have safety positions of open and closed. The licensee should evaluate the closed safety function of these valves in their IST program and revise their program as applicable.

7.17.3 Valves 1(2)E11-F119A&B (SE Section 6.3.1)

Motor-operated valves 1(2)E11-F119A&B, which serve as cross-tie isolation valves between the two trains of RHRSW on Units 1 and 2, are not included in the Hatch IST program. NUREG-1482, Table 2.2, lists cross-tie valves in BWR service water systems as valves with safety functions that are frequently omitted from IST programs. Their safety functions would be to open to allow cross-tie of the two trains of RHRSW and to close to isolate the trains from each other. The licensee should determine if these valves do have a safety function and revise their IST program as applicable.

7.18 RR-V-7 (SE Section 5.7)

The licensee should clarify the testing and inspection plan for the HPCI suppression pool pump suction check valves 1(2)E41-F045. If these valves are considered a group of two with one valve in the group tested every refueling outage, then the check valve inspection frequency is in accordance with the guidance of GL 89-04, Position 2, and the supplemental guidance provided in NUREG-1482. A specific request for relief from the Code requirements is not required if the guidance provided in the generic letter is met.

8.0 **CONCLUSION**

The staff concludes that the relief requests, cold shutdown justifications, refueling outage justifications and other portions of their IST program as evaluated and modified by this SE will not compromise the reasonable assurance of operational readiness of the pumps and valves in question to perform their safety-related functions. Relief Requests RR-P-9 and RR-V-2 were denied. In addition, Relief Requests RR-V-4, RR-V-8, RR-V-9 were granted on an interim basis for a period of 60 days to allow the licensee to respond to concerns raised in a previous safety evaluation. Finally, provisional authorization was given for Relief Request RR-P-10. The staff has determined that approval of relief requests and alternatives pursuant to 10 CFR 50.55a (f)(6)(i), (a)(3)(i), or (a)(3)(ii) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest. In making this determination, the staff has considered the impracticality of performing the required testing and the burden on the licensee if the requirements were imposed.

Principal Reviewers: J. Colaccino and M. Shuaibi

Date: April 12, 1996

APPENDIX A

SUMMARY OF SUBMITTED RELIEF REQUESTS

Relief Request Number	SE Section	OM-1990 Paragraph & Requirements	Equipment Identification	Alternate Method of Testing	NRC Action
RR-G-1	3.1	n/a	Entire IST program.	Applicable Codes shall be ASME OM Code-1990 for pumps and valves and ASME OM Code-1995 for relief valves.	Alternative authorized (a)(3)(i) in August 29, 1995 letter
RR-G-2	3.2	n/a	Entire IST program.	Update ISI programs for Units 1 and 2 concurrently	Alternative authorized (a)(3)(i)
RR-G-3	3.3	n/a	Entire IST program.	Phase in implementation of 3rd ten-year IST program in accordance with enclosed schedule.	Alternative authorized (a)(3)(i) in August 29, 1995 letter
RR-P-1	4.1	ISTB 4.6.1(f) vibration instrument frequency response range	Vibration instrumentation for standby liquid control (SLC) pumps.	Use existing vibration monitoring equipment which is calibrated to at least ±5 percent full scale over a frequency response range of 5.8-2000 Hz or 3-5000 Hz (SLC shaft rotational speed: 6.2 Hz)	Alternative authorized (a)(3)(ii)
RR-P-2	4.2	ISTB 4.6.1(b)(1) instrument full-scale range	1(2)E11-PI-R003A-D residual heat removal (RHR) pump discharge pressure gages.	Use installed instrumentation	Alternative authorized (a)(3)(ii)
RR-P-3	4.3	ISTB 4.6.1(b)(1) instrument full-scale range	1(2)E11-FI-R603A&B RHR pump discharge flow meters	Use installed instrumentation	Alternative authorized (a)(3)(i)
RR-P-4	4.4	ISTB 4.6.4(b) vibration measurement	1(2)E11-C001A-D RHR service water pumps 1(2)P41-C001A-D plant service water pumps	Read vibration measurements in the area of the pump to motor mounting flange	Alternative authorized (a)(3)(ii)
RR-P-5	4.5	ISTB 4.6.1(a) instrument quality	1(2)E21-PI-R600A&B core spray pumps discharge pressure gages	Use installed instrumentation	Alternative authorized (a)(3)(i)
RR-P-6	4.6	ISTB 4.6.1(b)(1) instrument full-scale range	1(2)E41-PI-R004 high pressure coolant injection (HPCI) pump suction pressure gage	Use installed instrumentation	Alternative authorized (a)(3)(i)

Relief Request Number	SE Section	OM-1990 Paragraph & Requirements	Equipment Identification	Alternate Method of Testing	NRC Action
RR-P-7	4.7	ISTB 4.6.1(b)(1) instrument full-scale range	1(2)E41-FI-R612 HPCI pump discharge flow meter	Use installed instrumentation	Alternative authorized (a)(3)(i)
RR-P-8	4.8	ISTB 4.6.4(b) vibration measurement	2P41-C002 Unit 2 standby plant service water pump	Read vibration measurements in the area of the pump to motor mounting flange	Alternative authorized (a)(3)(ii)
RR-P-9	4.9	Table ISTB 5.2-2a vibration values	All pumps in IST program	Assign absolute alert and required action range limits for pumps that the licensee classifies as "smooth running pumps."	Relief denied See Section 7.1 of this SE.
RR-P-10	4.10	Table ISTB 5.2-2a vibration values	1(2)E41-C001 HPCI pump	Raise the Code vibration alert limit from 2.5Vr to 6Vr or 0.325 inches/second to 0.400 inches/second	Alternative authorized (a)(3)(ii) with provision See Section 7.15 of this SE
RR-P-11	4.11	ISTB 6.2 time allowed for analysis of tests	All pumps in IST program	Use OM 1995 Edition, Paragraph ISTB 6.2.2	Alternative authorized (a)(3)(i)
RR-V-1	5.1	ISTC 4.3.2 inservice seat leakage rate test for containment isolation valves (CIVs)	1(2)B21-F016 main steam line drain CIV, 1(2)E41-F002 HPCI steam supply inboard CIV, 1(2)E51-F007 reactor core isolation cooling (RCIC) inboard steam supply CIV	Leak rate test in accordance with 10 CFR 50, Appendix J	Relief not required
RR-V-2	5.2	ISTC 4.2.8(d) stroke time acceptance criteria	1(2)B21-F022A-D and 1(2)B21-F028A-D main steam isolation valves (MSIVs)	Use upper and lower limiting stroke time to determine the stroke time acceptance criteria	Relief denied See Section 7.2 of this SE.
RR-V-3	5.3	ISTC 4.2.4(a) and 4.2.8 power-operated valve stroke testing and stroke time acceptance criteria	1(2)C11-F010A&B, 1(2)C11-F011, 1(2)C11-F035A&B, and 1(2)C11-F037 scram discharge volume vent and drain valves	Measure the response times of these valves as a group in accordance with the TS requirements	Relief granted (f)(6)(i)

Relief Request Number	SE Section	OM-1990 Paragraph & Requirements	Equipment Identification	Alternate Method of Testing	NRC Action
RR-V-4	5.4	ISTC 4.2.1, 4.2.4(a) and 4.2.8 exercise test frequency, power-operated valve stroke testing and stroke time acceptance criteria	1C51-F3012 Unit 1 transverse incore probe (TIP) purge containment isolation valve	Exercise this valve quarterly without measuring stroke time, verify that the nitrogen flow in the associated tubing has stopped when the valve is stroked, and perform a local leak rate test in accordance with 10 CFR 50 Appendix J each refueling outage	Interim relief granted (f)(6)(i) for 60 days See Section 7.3 of this SE.
RR-V-5	5.5	ISTC 4.3.2 containment isolation valves	1(2)C51-Shear A-D TIP outboard containment isolation shear valves	Allow the manufacturer to leak test a sample lot of valves prior to delivery	Relief granted (f)(6)(i)
RR-V-6	5.6	ISTC 4.5.1 and 4.5.2 exercising test frequency and exercise	1E11-F050A&B Unit 1 RHR system low pressure coolant injection (LPCI) injection check valves	Partial-flow test at least one of the two check valves every cold shutdown and perform mechanical exercising of both valves in accordance with Paragraph ISTC 4.5.4(b) every refueling outage	Relief not required. Licensee should write refueling outage justification and identify method used to meet Code requirements See Section 7.4 of this SE.
RR-V-7	5.7	ISTC 4.5.1 and 4.5.2 exercising test frequency and exercise	1(2)E41-F045 HPCI suppression pool pump suction check valves	Disassemble and inspect the valve [sic.] every second refueling outage	Relief not required. The licensee should document the inspection of these check valves in their IST program
RR-V-8	5.8	ISTC 4.2.3 valve obturator movement observation	1(2)P41-F035A&B 1(2)P41-F036A&B 1(2)P41-F037A-D 1(2)P41 F039A&B 2P41-F340 2P41-F339A&B air-operated equipment cooling water supply valves	Stroke-time the valves by observing actual valve stem movement	Interim relief granted (f)(6)(i) for 60 days See Section 7.5 of this SE.

Relief Request Number	SE Section	OM-1990 Paragraph & Requirements	Equipment Identification	Alternate Method of Testing	NRC Action
RR-V-9	5.9	ISTC 4.2.1, 4.2.4(a) and 4.2.8 exercise test frequency, power-operated valve stroke testing and stroke time acceptance criteria	2C51-F3012 Unit 2 TIP purge containment isolation valve	Exercise this valve quarterly without measuring stroke time, verify that the nitrogen flow in the associated tubing has stopped when the valve is stroked, and perform a local leak rate test in accordance with 10 CFR 50 Appendix J each refueling outage	Interim relief granted (f)(6)(i) for 60 days See Section 7.3 of this SE.
RR-V-10	5.10	ISTC 4.5.1 and 4.5.2 exercising test frequency and exercise	2E11-F050A&B Unit 2 RHR system LPCI injection check valves	Partial-flow test at least one of the two check valves every cold shutdown and perform mechanical exercising of both valves in accordance with Paragraph ISTC 4.5.4(b) every refueling outage	Relief not required. Licensee should write refueling outage justification and identify method used to meet Code requirements See Section 7.4 of this SE.

APPENDIX B

REVIEW OF COLD SHUTDOWN JUSTIFICATIONS

CSJ Number	Valve Number and Function	Cold Shutdown Justification	NRC Evaluation
CSJ-V-1	1(2)B21-F022A-D 1(2)B21-F028A-D Main Steam Isolation Valves	Full stroke testing these valves during normal reactor operation requires isolating one of the four main steam lines. Isolation of these lines results in primary system pressure spikes, reactor power fluctuations, and increased flow in the unisolated steam lines. This unstable operation can lead to a reactor scram and actuation of the primary system safety/relief valves. Stroking these valves during power operation requires decreasing the unit to 75 percent power, resulting in a substantial capacity factor loss. These valves will be partially stroke tested on a quarterly frequency.	The justification is consistent with Section 2.4.5 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown. The licensee should consider the NOTE in Section 4.2.4 of NUREG-1482 with regard to the partial quarterly stroke testing.
CSJ-V-2	1(2)B31-F031A&B Reactor Recirculation System Loop Isolation	Closure during normal operation requires a reduction in power to trip the associated recirculation pump. If the associated pump is tripped, it also creates a potential for exceeding the permissible temperature differential between the recirculation loops for pump re-start. In addition, the valves are located inside the primary containment and are inaccessible during normal operation, which precludes an operator from manually re-opening the valves in case of actuator failure. The valve operating circuitry does not allow for partial closure of the valves.	The justification is consistent with Section 2.4.5 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.
CSJ-V-3	1(2)E11-F008 1(2)E11-F009 RHR Shutdown Cooling Pressure Isolation	These valves are interlocked to prevent valve opening when reactor pressure is > 145 psig. Defeating the interlock and opening one of the in-line valves during normal operation could result in the over-pressurization of the low pressure design RHR pump suction piping.	The justification is consistent with Section 3.1.1 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.
CSJ-V-4	1E11-F015A&B LPCI Outboard CIV/PIV	These are normally closed valves which must open to permit LPCI and must close to provide containment and pressure isolation. The valves are interlocked to prevent opening unless the corresponding downstream valves are closed or reactor pressure is below a predetermined design value. The NRC GL 89-10 evaluation for these valves indicates that the valve motor operators were not required to be designed to ensure valve opening against the possible differential pressure that might be encountered if exercising during normal operation.	The justification is consistent with guidance provided in Sections 2.4.5 and 3.1.1 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.
CSJ-V-5	1E21-F005A&B Core Spray Injection Outboard CIV/PIV	These are normally closed valves which must open to permit core spray injection and must close to provide containment and pressure isolation. The valves are interlocked to prevent opening unless the corresponding downstream valves are closed or reactor pressure is below a predetermined design value to prevent over-pressurization of the core spray pump discharge piping and a LOCA outside of containment. The NRC GL 89-10 evaluation for these valves indicates that the valve motor operators were not required to be designed to ensure valve opening against the possible differential pressure that might be encountered if exercising during normal operation.	The justification is consistent with guidance provided in Sections 2.4.5 and 3.1.1 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.

CSJ Number	Valve Number and Function	Cold Shutdown Justification	NRC Evaluation
CSJ-V-6	1(2)E41-F002 1(2)E51-F007 HPCI/RCIC steam supply CIVs	These are normally open, motor operated valves located inside the primary containment. If a valve is exercised closed and fails to re-open, the entire system safety function would be rendered inoperable. Primary containment is inerted during normal operation and a plant shutdown would be required to repair the valve and restore the system safety function.	This deferral is consistent with Section 3.1.1 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to cold shutdown.
CSJ-V-7	1(2)G31-F001 1(2)G31-F004 Reactor Water Cleanup (RWCU) Pump Suction CIV	The RWCU System is in operation during normal plant operation in order to maintain reactor coolant chemistry within TS limits. The isolation valves are open whenever RWCU System is in operation supplying reactor coolant as pump suction source for processing and eventual return to the reactor coolant inventory. Exercising and stroke timing these valves closed quarterly requires the entire RWCU System to be taken out of service which could result in the degraded chemical makeup of reactor coolant and subject the entire RWCU System to unnecessary transients. These unnecessary transients could lead to degradation and failure of other related system components (e.g., pumps, valves, demineralizers) and the potential loss of the system availability which could cause required shutdown. Exercising and stroke timing these valves also results in undue hardships and exposure limits to personnel involved in the actual surveillance activity. The steps necessary to exercise and stroke time these valves are: 1) Take RWCU Demineralizers out of service, 2) Trip operating RWCU Pump, 3) Exercise and stroke time valves closed, 4) Align system valves to required position for system to be placed in service with reactor at operating conditions, 5) Restart RWCU Pump. (Standard plant practice is to position operator in pump room to monitor start. RWCU pumps are located in a High Radiation Area and Health Physics escort is required.), and 6) After pump is restarted and system flow stabilizes, the demineralizers are returned to service. RWCU System is normally put into service prior to reactor startup. Returning the system to service with reactor at normal operating conditions poses the potential for a system auto isolation which results in additional work of having to backwash the demineralizers before returning them to service. The system logic does not allow partial closure of these valves.	This deferral is consistent with Sections 2.4.5 and 2.5.1 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring this testing to cold shutdown.
CSJ-V-8	1P41-F049 1P41-F050 2P64-F045 2P64-F047 Drywell Air Cooler CIV	Closure of this valve would totally interrupt flow to the dry well coolers (Unit 1) or the dry well cooler condensers (Unit 2). This interruption of cooling water flow could result in an increase in the dry well temperatures which could require shutting the plant down because of TS requirements. The valve circuitry does not allow partial closure of this valve.	The staff agrees with the licensee's basis for deferring this testing to cold shutdown.
CSJ-V-9	1P41-F310A-D 2P41-F316A-D Turbine Building Supply Shutoff	During normal operation at least three service water pumps are required to provide cooling water to the safety and non-safety related loads. Closure (or failure to the closed safety position, during exercising) of one of these normally open valves in any sequence during normal operation would decrease flow to the turbine building equipment by a minimum factor of one-third and a maximum factor of two-thirds. A decrease in cooling water flow of this magnitude could cause increased temperatures for components necessary for power operation and result in a required power reduction, forced shutdown or plant trip. The valve circuity does not allow partial closure of this valve.	The justification is consistent with the guidance provided in Section 2.4.5 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.

CSJ Number	Valve Number and Function	Cold Shutdown Justification	NRC Evaluation
CSJ-V-10	1(2)P42-F051 1(2)P42-F052 RBCCW to Recirculation Pumps CIV	Closure of these normally open valves would result in a loss of the cooling water flow to the reactor recirculationpumps which could result in possible damage to the pumps. Valve operating circuitry does not provide for partial exercising.	The justification is consistent with the intent of the guidance provided in Section 2.5.1 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.
CSJ-V-11	2B21-F076A&B Feedwater Isolation	Isolating one of the feed water lines to perform a closure test would require reducing reactor power by approximately 50 percent and would introduce main feed water flow transients into the reactor due to an unsymmetrical injection pattern. This could affect other safety systems and potentially trip the reactor. Closure testing consists of a leak rate type test. Entry into the required areas, dry well and main steam chase, during power operation is not allowed due the dry well being inerted and high radiation levels in both areas. Performing this leak rate type test requires a significant amount of time to setup and perform valve alignments. Attempting to perform such testing during a cold shutdown could delay the startup of the unit. These normally-open feed water check valves have an air assist operator to ensure tight closure and are provided with remote position indicating lights. Closure will be confirmed by actuating the closure mechanism and observing the indicating lights.	The justification is consistent with the guidance provided in Section 2.4.5 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.
CSJ-V-12	2B21-F077A&B Feedwater Containment Isolation	Isolating one of the feed water lines to perform a closure test would require reducing reactor power by approximately 50 percent and would introduce main feed water flow transients into the reactor due to an unsymmetrical injection pattern. This could affect other safety systems and potentially trip the reactor. Closure testing consists of a leak rate type test. Entry into the required areas, dry well and main steam chase, during power operation is not allowed due the dry well being inerted and high radiation levels in both areas. Performing this leak rate type test requires a significant amount of time to setup and perform valve alignments. Attempting to perform such testing during a cold shutdown could delay the startup of the unit. These normally-open feed water check valves have an air assist operator to ensure tight closure and are provided with remote position indicating lights. Closure will be confirmed each cold shutdown by actuating the closure mechanism and observing the indicating lights. These valves are also leak tested (LLRT) in accordance with 10 CFR 50, Appendix J. With regard to the open direction, normal feed water flow is significantly greater than the flow rate required for the open safety function (HPCI or RCIC injection). Therefore, the valve is proven capable of opening to the required position with normal feed water injection during power operation.	The justification is consistent with the guidance provided in Section 2.4.5 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to cold shutdown.

APPENDIX C

REVIEW OF REFUELING OUTAGE JUSTIFICATIONS

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-1	1(2)B21-F010A&B Feedwater line inboard injection and containment isolation valve (CIV) check valves	Feedwater injection is required during normal operation. Isolating one of the feedwater lines to perform a closure test would require reducing reactor power by approximately 50 percent and would introduce main feed water flow transients into the reactor due to an unsymmetrical injection pattern. This could affect other safety systems and potentially trip the reactor. Closure testing consists of a leak rate type test and entry into the required areas, drywell and main steam chase, during power operation is not allowed due the drywell being inerted and high radiation levels in both areas. Performing this leak rate type test requires a significant amount of time to setup, isolate portions of the system, and perform valve alignments. Attempting to perform such testing during a cold shutdown could delay the startup of the unit. Normal feed water flow is significantly greater than the flow rate required for the open safety function (HPCI [high pressure coolant injection] or RCIC [reactor core isolation cooling] injection). Therefore, the valve is proven capable of opening to the required position with normal feed water injection during power operation. **ALTERNATE TESTING:** Open exercising is performed with normal feed water injection to the reactor and closure exercising will be proven each refueling outage during Appendix J, local leak rate testing.	The justification is consistent with Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to refueling outages.
ROJ-V-2	1B21-F013B, D, E, F, J, K, L 2B21-F013A, C, E, H, K, L, M Nuclear boiler system main steam over-pressure protection automatic de-pressurization relief valves	Failure of these valves to close after exercising during power operation would result in a loss of reactor coolant. Additionally, these valves cannot be exercised at a pressure below 100 psig and the position of the main stage of this 2 stage relief valve can only be determined by indirect means. **ALTERNATE TESTING:** Each pilot operating assembly is removed and sent to an independent testing laboratory each refueling outage. The pilot assemblies are inspected and set-point tested in accordance with ASME OMc Code, 1994 Addenda, Appendix I to determine their operating condition. Each pilot assembly is also stroke timed to monitor degradation and ensure that it actuates within an acceptable time range. Each pilot assembly is repaired and/or adjusted to ensure its operability prior to re-installation. Additionally, each valve is exercised using the manual control switch at least once every 18 months. This bench testing, pilot stroke timing, maintenance/ adjustments, and inspection performed each refueling outage should ensure that the valves are maintained in a state of operational readiness.	This justification pertains to the exercising requirements of Paragraph ISTC 4.2.2 and also the power-operated stroke testing requirements of Paragraph ISTC 4.2.4. Test methods employed by the licensee that are different from the Code require an approved relief request. Therefore, relief is required from the requirements of Paragraph ISTC 4.2.4. The staff agrees with the deferral of this valve exercising to refueling outages. See Sections 2.1 and 7.6 of this Safety Evaluation (SE).

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-3	Excess flow check valves CIVs (86 valves per unit)	The test requirements for check valves in the ASME OM Code are intended for testing simple check valves. The excess flow check valves are designed to actuate and limit flow in the case of an instrument line break downstream of the valve and installation of these valves meets the provisions of NRC Safety Guide 11 (Unit 1) or Reg. Guide 1.11 (Unit 2). The valves limit the leakage in the event of an instrument line break to within the capacity of the reactor coolant makeup system. The more critical requirement for the valves is to remain open when a fault does not exist to guarantee the reactor protection function of the instruments. The instruments served by these valves are critical during both plant operation and cold shutdown. Testing of these valves requires the removal from service of portions of the reactor protection instrumentation for an extensive period of time. **ALTERNATE TESTING:** Section 3.6.1.3.8 (Unit 1 and Unit 2) of the Plant Technical Specifications specifies the frequency (at least once per 18 months) of testing to verify operability and flow limiting capability of all excess flow check valves. Testing will be performed in accordance with the Technical Specification requirements.	The staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-4	1B21-F032A&B Feedwater outboard CIV	Feedwater injection is required during normal operation. Isolating one of the feedwater lines to perform a closure test would require reducing reactor power by approximately 50 percent and would introduce main feed water flow transients into the reactor due to an unsymmetrical injection pattern. This could affect other safety systems and potentially trip the reactor. Closure testing consists of a leak rate type test and entry into the required areas, dry well and main steam chase, during power operation is not allowed due the drywell being inerted and to high radiation levels in both areas. Performing this leak rate type test requires a significant amount of time to setup, isolate portions of the system, and perform valve alignments. Attempting to perform such testing during a cold shutdown could delay the startup of the unit. **ALTERNATE TESTING:** The valves will be confirmed to be exercised to the closed position each refueling outage by performing an Appendix J, Type C local leak rate or similar type test. The acceptance criteria of such testing should ensure that even slight valve degradation will be detected and corrected each refueling outage.	The justification is consistent with Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to refueling outages.
ROJ-V-5	1B21-F036A, B, C, D, E, F, G, H, J, K, L 2B21-F036A, B, C, D, E, F, G, H, K, L, M Main steam relief valve accumulator check valves	These valves cannot be tested during power operation because entry into the drywell is required. The drywell is inerted during normal operation. Because of the setup time, valve alignments and complexity of the test, attempting to perform these tests during cold shutdowns would potentially delay the startup of the unit. **ALTERNATE TESTING:** Reverse flow closure of these valves is verified each refueling outage by a leak test procedure similar to Appendix J, Type C, leak rate testing.	The justification is consistent with Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the deferral of this test to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-6	1(2)B31-F013A&B 1(2)B31-F017A&B Recirculation Pump Seal Water check valves	These valves are located in the Recirculation Pump Seal Water injection lines which require continuous flow during power operation in accordance with the pump manufacturer's recommendations. Quarterly testing could damage the seals. Also, to attempt to perform this test during a cold shutdown could delay the startup of the unit. **ALTERNATE TESTING:** Closure of these valves will be proven each refueling outage by performing an Appendix J, Type C local leak rate or similar type test.	The staff agrees with the licensee's basis to defer this testing to refueling outages.
ROJ-V-7	1(2)C11-HCU-114 Scram discharge volume hydraulic control unit (HCU) check valves (typical of 137)	These valves are located on the scram discharge line of each CRD. Flow through each check valve is experienced only during the scram of the associated CRD unit. **ALTERNATE TESTING:** The required flow is achieved through the valves during the Technical Specification Control Rod Scram Insertion tests. (1) As a minimum, 10 percent of the CRDs are scram timed on a rotating basis every 120 days. (2) After each refueling outage or reactor shutdown ≥ 120 days, all control rods are scram tested from the fully withdrawn position.	The testing of these valves is in accordance with the guidance provided in Generic Letter 89-04, Position 7. No further NRC evaluation is required.
ROJ-V-8	1(2)C11-HCU-115 Charging water header HCU check valves (typical of 137)	Reverse flow closure verification of the charging water header check valves requires that the CRD pumps be stopped in order to depressurize the charging water header. This test cannot be performed during normal operation because stopping the pumps results in loss of cooling water to all CRD mechanisms and seal damage could result. Additionally, it is impractical to perform this testing during cold shutdown because the CRD pumps supply seal and motor purge water to the RWCU [reactor water cleanup] system pumps. RWCU is normally maintained in operation during shutdowns to maintain reactor coolant chemistry in accordance with Technical Specification requirements. **ALTERNATE TESTING:** Reverse flow closure will be confirmed at each refueling outage by performance of a HCU accumulator pressure decay test.	The testing of these valves is in accordance with the guidance provided in Generic Letter 89-04, Position 7. No further NRC evaluation is required.
ROJ-V-9	1(2)C11-HCU-126 1(2)C11-HCU-127 Scram Inlet and Outlet Valves	The Hydraulic Control Units are integrally designed systems for controlling rod drive movements. Individual valve testing is not possible without causing a control rod scram with a resulting change in core reactivity. Quarterly testing of these valves increases the potential to violate plant Technical Specifications which govern the methods and frequency of reactivity changes. In addition, these are power operated valves that full-stroke in milliseconds and are not equipped with remote position indicators. Therefore, measuring their full-stroke time is impractical. Verifying that the associated control rod meets the scram insertion time limits defined in the Technical Specifications provides an alternate method of detecting valve degradation. Trending the stroke times of these valves is impractical and unnecessary since they are indirectly stroke timed and no meaningful correlation between the scram time and valve stroke time can be obtained. **ALTERNATE TESTING:** Technical Specification Control Rod Scram Insertion Time testing serves to verify proper operation of each of these valves. (1) As a minimum, 10 percent of the CRDs are scram timed on a rotating basis every 120 days. (2) After each refueling outage or reactor shutdown ≥ 120 days all control rods are scram tested from the fully withdrawn position.	The testing of these valves is in accordance with the guidance provided in Generic Letter 89-04, Position 7. No further NRC evaluation is required.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-10	1(2)C41-F006 1(2)C41-F007 SBLC [standby liquid control] outboard and inboard CIVs	Forward flow exercising can only be performed by injecting into the reactor vessel using the SBLC pumps. The pumps are normally aligned to a sodium pentaborate storage tank and they would have to be aligned to demineralized water for exercise testing of the check valves. The associated piping would have to be flushed prior to the test and refilled with sodium pentaborate after the open exercise test. Closure testing can only be performed by a leak rate type test. Testing of these normally closed valves quarterly or during cold shutdown would require: (1) actuation and restoration of the explosive squib valves, 1(2)C41-F004A(B), to allow injection into the RPV (open exercise); (2) personnel entry into the primary containment to operate the manual test boundary valve 1(2)C41-F008 (close exercise); and (3) disablement of the entire SBLC system (close exercise). Due to the time required to setup the testing, the complexity of the test, and the time required for associated valve alignments, attempting to perform this testing at cold shutdown could potentially delay startup of the unit. **ALTERNATE TESTING:** These valves are full flow exercised once each refueling outage during Technical Specifications surveillance testing. Closure is verified each refueling outage by performing an Appendix J, type C local leak rate or similar type test.	The staff agrees with the licensee's basis to defer this testing to refueling outages for forward flow testing. In addition, the justification to defer closure testing is consistent with the guidance provided in Section 4.1.4 of NUREG-1482.
ROJ-V-11	1(2)C51-F3017 Transverse incore probe (TIP) nitrogen purge check valve	The only way to verify reverse closure is by performing a leak rate type test. These normally open check valves are located inside the primary containment and therefore are inaccessible during power operation. The primary containment is inerted during normal operation and personnel entry is prohibited. Therefore, testing during normal operation is impracticable. Performing a leak rate type test requires a significant amount of time to setup the test and align the associated valves. To attempt to perform these tests during an unscheduled cold shutdown could delay the startup of the unit. **ALTERNATE TESTING:** Reverse flow closure of these valves will be proven each refueling outage by performing an Appendix J, Type C local leak rate or similar type test.	The justification is consistent with the guidance provided in Section 4.1.4 of NUREG 1482. Therefore, the staff agrees with the deferral of this test to refueling outages.
ROJ-V-12	1(2)E11-F046A-D Residual heat removal (RHR) pump minimum flow line check valves	These valves are located in the RHR pump minimum flow line. The minimum flow line was not provided with installed instrumentation to allow confirmation of full flow exercising of the check valves in conjunction with RHR pump surveillance testing. **ALTERNATE TESTING:** Partial flow is achieved through the check valves during quarterly RHR pump surveillance testing. Additionally, one valve from each unit will be disassembled, visually inspected and manually full stroke exercised each refueling outage. Disassembly of the valves requires that the associated loop of RHR be declared inoperable, therefore performing this valve disassembly during an unplanned cold shutdown could potentially delay startup of the unit.	The justification is consistent with the guidance provided in Position 2 of GL 89-04. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-13	1(2)E21-F006A&B Core Spray injection and pressure isolation valve (PIV) check valves	System configuration does not provide for full or partial flow exercise testing during normal operation. Core spray injection during normal operation is impossible because reactor pressure is significantly greater than core spray injection pressure. Power is removed from the equalization valve (1(2)E21F037A(B)) during normal operation making partial exercising impractical because these valves function as simple check valves. These valves are inaccessible, located inside the primary containment, PIVs and erroneous signal indications caused by exercising could not be readily distinguished from actual valve problems without shutting down the plant, de-inerting the containment, and performing a containment entry. The only possible way to flow test these valves is by injecting suppression pool water or condensate storage tank (CST) water into the RPV. Utilizing either suction source results in a significant degradation of the reactor coolant quality due to the relatively poor quality of the suppression pool water or the relatively poor quality of stagnant water in the core spray piping. A significant amount of time would be required to restore reactor coolant to the Technical Specification required quality. Therefore exercising with flow at cold shutdown or refueling is impractical. These valves are located inside the primary containment and are therefore inaccessible during normal operation or at cold shutdown unless the containment is de-inerted. The containment is not de-inerted during an unplanned shutdown unless containment entry is necessary. Therefore mechanical exercising quarterly or at cold shutdown is impractical. **ALTERNATE TESTING:** Each check valve will be mechanically exercised per ISTC 4.5.4(b) during each refueling outage. This mechanical exercising, in conjunction with OM Code local leak rate testing each refueling outage should provide sufficient confirmation of valve operability.	The staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-14	1(2)E21-F044A&B Core spray jockey pump bypass isolation stop check valves	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. This type testing requires a significant amount of time to setup, align valves and perform the test and testing at cold shutdown could potentially delay startup of the unit. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. Appendix J local leak rate testing requirements are not applicable to these valves. Review of previous testing and maintenance history does not indicate any abnormal failure rate or maintenance requirements for these valves. These valves are located in the jockey pump recirculation line back to the suppression pool. Performing the pressure test quarterly would require removing the associated jockey pump(s) from service and would likely result in not maintaining the associated train of RHR and Core Spray piping full of water as required by Technical Specifications. This would result in unnecessary ECCS unavailability and potential entries into Technical Specification 3.0.3. Per Technical Specifications the RHR and Core Spray Systems are normally required to be operable during brief periods of cold shutdown. This testing can be more safely and efficiently performed during refueling outages. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a leak rate test similar to an Appendix J, type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-15	1(2)E41-F021 HPCI turbine exhaust inboard isolation stop check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. The valves are located in the HPCI turbine exhaust to suppression pool line. Testing these valves quarterly during power operation results in removing the HPCI system from the operable condition and causes unnecessary safety system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because HPCI is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a local leak rate test similar to an Appendix J, Type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-16	1(2)E41-F022 HPCI turbine exhaust drain inboard isolation stop check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the HPCI turbine exhaust drain to suppression pool line. Testing these valves quarterly during power operation will result in removing the HPCI system from the operable condition and would cause unnecessary safety system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because HPCI is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a local leak rate test similar to an Appendix J, Type C test. Additionally, these valves are disassembled, visually inspected, and full stroke exercised in accordance with NRC GL 89-04, Position 2. The inspection during disassembly should adequately detect any degradation in sufficient time to take corrective actions prior to the valve becoming inoperable.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. In addition, the proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-17	1(2)E41-F040 HPCI turbine exhaust drain isolation check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the HPCI turbine exhaust to suppression pool line. Testing these valves quarterly during power operation will result in removing the HPCI system from the operable condition and would cause unnecessary system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because HPCI is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a local leak rate test similar to an Appendix J, Type C test. Additionally, these valves are disassembled, visually inspected, and full stroke exercised in accordance with NRC GL 89-04, Position 2. The inspection during disassembly should adequately detect any degradation in sufficient time to take corrective actions prior to the valve becoming inoperable.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. In addition, the proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-18	1(2)E41-F046 HPCI pump minimum flow outboard isolation check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the HPCI minimum flow line to suppression pool. Testing any of these valves quarterly during power operation will result in removing the HPCI system from the operable condition and would cause unnecessary safety system unavailability. Testing these valves quarterly during power operation will result in removing the HPCI system from the operable condition and would cause unnecessary system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because HPCI is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a leak rate test similar to an Appendix J, Type C test. Additionally, these valves are disassembled, visually inspected, and full stroke exercised in accordance with NRC GL 89-04, Position 2. The inspection during disassembly should adequately detect any degradation in sufficient time to take corrective actions prior to the valve becoming inoperable.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. In addition, the proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-19	1(2)E41-F049 HPCI turbine exhaust outboard isolation check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. The valves are located in the HPCI turbine exhaust to suppression pool line. Testing these valves quarterly during power operation results in removing the HPCI system from the operable condition and causes unnecessary safety system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because HPCI is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure tested each refueling outage by performance of a local leak rate test similar to an Appendix J, Type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-20	1(2)E51-F001 RCIC turbine exhaust inboard isolation stop check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the RCIC turbine exhaust drain line to suppression pool. Testing these valves quarterly during power operation will result in removing the RCIC system from the operable condition and would cause unnecessary system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because RCIC is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure at each refueling outage by performance of a local leak rate test similar to an Appendix J Type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-21	1(2)E51-F002 RCIC turbine exhaust drain torus isolation stop check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the RCIC barometric condenser vacuum pump discharge line to the suppression pool. Testing these valves quarterly during power operation will result in removing the RCIC system from the operable condition and would cause unnecessary system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because RCIC is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure at each refueling outage by performance of a local leak rate test similar to an Appendix J Type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-22	1(2)E51-F021 RCIC pump minimum flow outboard isolation check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the RCIC minimum flow line to suppression pool. Testing these valves quarterly during power operation will result in removing the RCIC system from the operable condition and would cause unnecessary system unavailability. To perform the required valve lineups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because RCIC is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure at each refueling outage by performance of a leak rate test similar to an Appendix J Type C test. Additionally, these valves are disassembled, visually inspected, and full stroke exercised in accordance with NRC GL 89-04, Position 2. The inspection during disassembly should adequately detect any degradation in sufficient time to take corrective actions prior to the valve becoming inoperable.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. In addition, the proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-23	1(2)E51-F028 RCIC turbine exhaust drain check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated Systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the RCIC turbine exhaust drain line to the suppression pool. Testing these valves quarterly during power operation will result in removing the RCIC system from the operable condition and would cause unnecessary system unavailability. To perform the required valve line ups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because RCIC is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure at each refueling outage by performance of a local leak rate test similar to an Appendix J type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance provided in Section 4.1.4 of NUREG-1482. In addition, the proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.
ROJ-V-24	1(2)E51-F040 RCIC turbine outboard exhaust isolation check valve	These valves function as containment isolation barriers. The only viable means of proving closure is by performing a leak rate or pressure test. To perform this test quarterly would require removing the associated systems from operation. Since these valves only provide a containment barrier function and allowable leakage limits are significantly greater than allowed for containment isolation valves, and the fact that these valves are not exposed to severe operating conditions which would promote rapid degradation; leak rate or pressure testing at a refueling outage frequency will provide sufficient test results to ensure a margin of safe component operability. These valves are located in the RCIC turbine exhaust line to the suppression pool. Testing these valves quarterly during power operation will result in removing the RCIC system from the operable condition and would cause unnecessary system unavailability. To perform the required valve line ups, equipment setup and perform the test takes a significant amount of time for each test. Therefore, performing the tests at cold shutdown could delay the startup of the unit. Because RCIC is a standby system which is normally only operated during surveillance testing, these valves do not experience service conditions which would promote rapid degradation. **ALTERNATE TESTING:** Valves will be reverse flow closure at each refueling outage by performance of a local leak rate test similar to an Appendix J type C test. The equipment utilized for this testing allows measurement of the leakage rate from the test boundary and trending of any significant changes in leakage characteristics.	This deferral is consistent with the guidance in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-25	1(2)E41-F102 1(2)E41-F103 HPCI Steam exhaust line vacuum breakers	Operability of these simple check valves cannot be proven by normal process flow since they are acting as vacuum relief valves. If a vacuum forms in the turbine exhaust line due to steam condensation, the disc will lift from the seat sufficiently to allow air into the line. Otherwise, there is no movement of the disc. **ALTERNATE TESTING:** During the local leak rate test for valves 1(2)E41-F104 and 1(2)E41-F111 the piping is pressurized between valves 1(2)E41-F111 and 1(2)E41-F104. Valve 1(2)E41-F103 will then be vented as part of the test to ensure that flow passes through the check valves thus ensuring their vacuum breaker function since this flow rate will be greater than that required for vacuum relief. Closure of the valves is proven during quarterly HPCI pump surveillance testing. If the valve did not close, steam would bypass the suppression pool into the torus bay air space and cause a resultant temperature increase. Reverse flow closure is also proven in conjunction with LLRT of valves 1(2)E41-F104 and 1(2)E41-F111. With the boundary between valves 1(2)E41-F104 and 1(2)E41-F111 pressurized, the 1(2)E41-F111 valve is opened and each valve, 1(2)E41-F102 and 1(2)E41-F103, is confirmed to be closed. The Appendix J, type C LLRT or a similar type test for valves 1(2)E41-F104 and 1(2) E41-F111 will be performed each refueling outage to confirm open and close exercising of valves 1(2)E41-F102 and 1(2)E41-F103.	The licensee should revise this ROJ to include justification for not performing the Code testing for both the open and closed safety function of these check valves. In addition, the testing used to verify the open safety function appears to test both check valves in series when there are test connections available to facilitate individual valve testing. See Section 7.7 of this SE.
ROJ-V-26	1G31-F039 1G31-F203 reactor water cleanup discharge CIVs	These normally open check valves are located in the RWCU return line to the reactor vessel thru each feed water line. To establish the necessary test boundary for each of these valves will require closure of the manual feed water valve, lB21-F011A(B), which is located inside primary containment. Entry into primary containment is not possible during normal operation due to the nitrogen inerted atmosphere. To perform the test during cold shutdown would require the same test boundary as above. Therefore, performing the test would require; de-inertion of the primary containment, multiple personnel entries into a potential high radiation exposure area, valve manipulations, setup of test equipment, actual test performance, evaluation of test results, re-establishment of normal system alignments and Technical Specification required nitrogen inert ion of the containment upon startup. Performing these activities would require a significant amount of time and could delay the startup of the unit from an unplanned cold shutdown. Therefore, due to the problems associated with an inerted containment, multiple personnel containment entries to support the tests, ALARA concerns and the actual test duration, performance during cold shutdown seems unwarranted. **ALTERNATE TESTING:** These check valves will be confirmed to close each refueling outage during an Appendix J, type C local leak rate test.	This deferral is consistent with the guidance in Section 4.1.4 of NUREG-1482. Therefore, the staff agrees with the licensee's basis for deferring valve testing to refueling outages.

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-27	1P41-F552A&C Plant Service Water System: Diesel Generator Cooling Water Discharge Line Check Valve	These normally open check valves are located in the cooling water discharge lines from diesel generators 1A and 1C. There are no system design provisions to measure cooling water flow and thus verify forward flow operability. Each diesel generator is operated for a minimum of one hour at 1710 - 2000 kW (approx. 60 percent of continuous rated load) during testing once each month. Partial forward flow operability is verified during this test by monitoring diesel generator oil and jacket cooling water temperatures. If sufficient cooling water flow was not provided to the diesel generator, elevated oil and jacket cooling water temperatures would be evident. Each diesel generator is also operated for a minimum of one hour at 2250 - 2400 kW (approx. 80 percent of continuous rated load) semi-annually. Partial flow operability is again verified during this test by monitoring diesel generator oil and jacket cooling water temperatures. During each refueling outage (at least once per 18 months) each diesel generator is operated for a minimum of 24 hours. During the first two hours of this test, the diesel is loaded to ≥ 3000 kW (approx. 105 percent of continuous rated load) and during the remaining 22 hours of this test, the diesel is loaded to 2775 - 2825 kW (approx. 90 percent of continuous rated load). Diesel generator oil and jacket cooling water temperatures are monitored during this test to ensure that sufficient cooling water is provided. Acceptable operation of the diesel generators during the monthly and semi-annual tests verifies that the valves are not stuck in the closed position. Acceptable operation of the diesel generators during each refueling outage test verifies that the check valves have opened sufficiently to perform their design function. The diesel generator oil and jacket cooling water temperatures for each test are trended to ensure no significant changes occur from test to test. The Architect Engineer (AE) performed an evaluation of these valves associated with INPO SOER 86-03 in 1987. This evaluation considered valve type, operating conditions and environment, and past valve maintenance history. The AE recommended periodic disassembly and inspection of the valve internals with at least one of the two valves being inspected every third refueling outage. The AE also recommended that the frequency of inspection be adjusted depending on inspection results. **ALTERNATE TESTING:** Existing monthly and semi-annual diesel surveillance testing will be utilized to prove at least partial check valve exercising. The existing refueling outage frequency diesel testing will be utilized to confirm that the valves will open sufficiently to perform their design safety function. Additionally, at least one of the two valves will be disassembled, manually exercised and visually inspected each refueling outage on a rotating frequency in accordance with NRC GL 89-04, Position 2. This disassembly frequency should be adequate to detect any valve degradation in sufficient time to take corrective action and prevent the valve from being unable to performing its safety function. Inspection results will be reviewed, and the disassembly frequency will be adjusted if warranted. The valves are flanged into the system piping and are completely removed when inspected. The valve is visually inspected and manually full stroke exercised prior to being reinstalled in the pipe line. The valve disassembly is performed prior to the 24 hour diesel surveillance test, thus the safety function of the valve is confirmed after reassembly by monitoring diesel generator cooling during testing. This diesel testing confirms at least partial valve exercising after reinstallation in the system. Existing diesel generator surveillance testing in conjunction with the periodic disassembly and inspection should confirm the capability of the valves to perform their intended safety function and should identify any degradation concerns prior to the valves becoming inoperable.	The proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Any extension of the disassembly and inspection frequency should be implemented in accordance with Position 2. The licensee should also note that extension of the disassembly frequency to every other refueling outage is permissible only in cases of "extreme hardship." (see NUREG-1482, Page A-13, Question Group 19)

ROJ Number	Valve Number and Function	Refueling Outage Justification	NRC Evaluation
ROJ-V-28	1(2)E21-F036A&B Core spray pump minimum flow line containment boundary	These valves are located in the core spray pump minimum flow lines discharging to the suppression pool. Valves must open to provide minimum flow protection for the core spray pumps and close to provide containment boundary. Since there is no valve between the check valve and the suppression pool the line cannot be pressurized to ensure closure of the valve. This valve is sealed from the primary containment atmosphere because the test line terminates below the water level of the torus and the leakage is not included in the Type C local leak rate testing. **ALTERNATE TESTING:** Each valve is partial exercised open quarterly during core spray pump surveillance testing. One valve for each unit will be disassembled, manually exercised and visually inspected each refueling outage per the guidance of GL 89-04. The valve internals will be confirmed as structurally sound (no loose or corroded parts) and the disk manually exercised to confirm full stroke capability. If the disassembled valve is not capable of being manually full stroke exercised or there is binding or failure of valve internals, the remaining valve will also be disassembled, inspected and manually full stroke exercised during the same outage. There are no test connections provided to facilitate any measurements during pump testing. Therefore, partial flow exercising after re-assembly will be confirmed by indirect means such as monitoring pipe wall temperature changes, using acoustic monitoring equipment or observing flow induced vibration and noise.	The proposed disassembly and inspection frequency and method is consistent with the guidance provided in GL 89-04, Position 2. Therefore, the steff agrees with the licensee's basis for deferring valve inspection to refueling outages.