UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001
June 27, 2002

Mr. J. W. Moyer, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2 (HBRSEP2) - RELIEF REQUESTS FOR THE FOURTH 10-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM (TAC NO. MB2798)

Dear Mr. Moyer:

By letter dated August 24, 2001, as supplemented by letter dated February 20, 2002, Carolina Power & Light Company, licensee for HBRSEP2, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Sections 50.55a(a)(3)(i), 50.55a(a)(3)(ii), and 50.55a(f)(6)(i), submitted seven relief requests for their fourth 10-year interval inservice testing (IST) program for pumps and valves.

The staff reviewed the relief requests and associated proposed alternative testing method for these pumps and valves against the requirements of American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code, 1995 Edition and the 1996 Addenda, which are incorporated by reference in 10 CFR 50.55a. The staff findings are provided in the enclosed Safety Evaluation.

Pursuant to 10 CFR 50.55a(a)(3)(i), relief requests IST-RR-1, -4, -5, and -7 are authorized based on an acceptable level of quality and safety that will be provided by the alternatives.

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief request IST-RR-2 is authorized on the basis that compliance with the specified Code requirements would result in hardship without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(f)(6), relief IST-RR-3 is authorized for an interim period until the end of Refueling Outage 22, tentatively scheduled to be in April 2003, on the basis that the Code-required test is impractical to perform without significant plant modification.

Relief request IST-RR-6 is denied, but the Code-required test shall be performed at cold shutdowns or refueling outages as permitted by the OM Code.

The disposition of these seven reliefs is summarized in the Table attached to the Enclosure that identifies the Code requirements, issues, and the appropriate 10 CFR 50.55a sections authorizing the reliefs.

These reliefs are authorized for the fourth 10-year interval for HBRSEP2, which began on February 19, 2002, and is scheduled to end on February 18, 2012.

If you have any questions, please contact R. Subbaratnam at 301-415-1478.

Sincerely,

Kahtan N. Jabbour

Kahtan Jabbour, Acting Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Safety Evaluation

cc w/encl: See next page

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO FOURTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

DOCKET NUMBER 50-261

1.0 INTRODUCTION

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 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 paragraphs (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 which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

By letter dated August 24, 2001, Carolina Power & Light Company (CP&L, licensee for H. B. Robinson Steam Electric Plant Unit 2 (HBRSEP2)) submitted seven relief requests for their fourth 10-year interval IST program for pumps and valves. Additional information for relief requests IST-RR-6 and IST-RR-7 was provided in a letter dated February 20, 2002.

The fourth 10-year interval for HBRSEP2 began on February 19, 2002, and is scheduled to end on February 18, 2012. The staff has reviewed the relief requests and associated proposed alternative testing method for these pumps and valves against the requirements of the ASME Operation and Maintenance (OM) Code, 1995 Edition and the 1996 Addenda, which are incorporated by reference in 10 CFR 50.55a, and is providing the following evaluation.

2.0 EVALUATION

2.1 Relief Request IST-RR-1

The licensee has requested relief from and elimination of the requirements for the duties, qualifications, and access provisions for the Authorized Inspection Agency and Inspectors (AIAI) as identified in OM Code, ISTA 1.5 and ISTA 2.1.

2.1.1 Licensee's Basis for Requesting Relief

The licensee states:

> The requirements for the Authorized Inspection Agency and the Authorized Inspector have been eliminated in the 1998 Edition/2000 Addenda of the OM Code. It has been determined that the reviews and verifications conducted by the Inspector have not provided an increase in quality and safety commensurate with the level of effort to perform these tasks. The Inspector's level of expertise is generally relegated to inservice inspection activities. The IST program is subject to reviews and onsite inspections by the NRC, internal audits and verifications by the Nuclear Assessment Section, internal self-assessments and cross-disciplinary reviews, as well as external third part audits. Many tests and IST related inspections must be temporarily stored in order to provide reasonable access to the inspector. This results in additional delays in processing and increases the risk of damage or loss of a QA [Quality Assurance] record. In addition, the permanent storage of documents is extended; which reduces easy assess to previous test results via plant processes by other inspection agencies or plant personnel. Based on the information above, additional requirements related to the Authorized Inspection Agency and Inspectors would constitute an additional burden without a corresponding increase in the level [of quality] and safety.

2.1.2 Alternative Testing

The licensee proposes:

> The specific requirements for the duties, the qualifications and access provisions for the Authorized Inspection Agency and Inspectors shall be eliminated from the IST program [in light of the licensee's own review process for the IST program as an alternative].

2.1.3 Evaluation

The 1995 Edition with the 1996 Addenda of the OM Code requires that IST activities be verified by an AIAI. It is the AIAI's duties to verify that inservice tests on pumps, valves, and components supports have been completed and results recorded. The licensee proposes to eliminate from the IST program specific requirements for access for the AIAI, qualification of the authorized inspection agencies and inspectors, and duties of the AIAI. The licensee states that the IST program is subject to reviews and onsite inspections by NRC, internal audits and verifications by the Nuclear Assessment Section, internal self-assessments and cross-disciplinary reviews, as well as external third party audits.

As stated by the licensee, utilities have a multi-layered review process that performs the same functions as the AIAI. AIAIs generally do not have the training or background experience to

make determinations of the safety function of components in order to verify the scope of the IST program, or assess the operational readiness of components based on test results. In the 1998 Edition/2000 Addenda of the OM Code, the requirements for the Authorized Inspection Agency and the Authorized Inspector have been removed.

The licensee's own review process for the IST program provides an equivalent level of quality and safety as the Code requirements for AIAI involvement. Therefore, the staff finds the proposed alternative to be acceptable.

2.1.4 Conclusion

The elimination from the IST program of specific requirements for access for the AIAI, qualification, and duties of the AIAI 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.

2.2 Relief Request IST-RR-2

The licensee has requested relief from the digital pump flow-rate instrument accuracy of ±2% as identified in Table ISTB 4.7.1, and proposes to use non-calibrated ultrasonic flow measuring instruments in the unlikely event that calibrated flow measuring instruments are not available.

2.2.1 Licensee's Basis for Requesting Relief

The licensee states:

> Original plant design occurred prior to the issuance of Section XI inservice testing requirements. Since most of the systems were not designed with flow measurement instrumentation, ultrasonic flow measuring equipment is installed during testing to take the flow measurements required by the IST Program. These instruments meet the Code accuracy requirements. Generally, spare instruments are maintained and certified, but may not be available, or rendered inoperable. When calibrated instruments are not available, back-up instruments can be installed and verified in accordance with a detailed test procedure in order to provide a high level of assurance relative to the proper operation of the flow rate devices.
>
> The NRC has previously granted relief to use ultrasonic flow instruments in the third interval IST program. NRC Safety Evaluation, transmitted in NRC letter dated September 16, 1992, accepted the use of ultrasonic flow instruments that have an intrinsic accuracy of ±3% on a temporary basis. Final approval was dependent on the establishment of procedures and controls that ensure measurements are sufficiently repeatable to allow detection of pump degradation. Also required, was a determination of the in-situ accuracy and repeatability in each application. Subsequently CP&L transmitted, in a letter dated December 6, 1993, confirmation that ultrasonic flow instrumentation data taken during one cycle indicates the equipment has sufficient accuracy and repeatability to permit detection of hydraulic degradation, and supports the evaluation of results using Code allowable ranges. The NRC accepted this additional information in a letter dated, July 15, 1994. Past experience indicates that these flow measurements are highly accurate. In addition, these instruments are mounted externally, which avoids problems inherently associated with internally installed

measuring devices, such as, increased system resistence, flow obstruction, and removing the system from service when instrument maintenance is required.

Calibration of these instruments cannot be accomplished onsite. For large bore pipes, the calibration vendor must arrange for the use of a special test facility. Experience has shown that the expected time period associated with obtaining an emergent instrument calibration is about two to six weeks and is largely dependent on events beyond the control of CP&L. All ultrasonic flow instruments required to be calibrated in accordance with ISTB 4.7.1-1 are validated to be operating properly in accordance with procedural requirements typically within a day prior to the performance of the scheduled test. The Technical Specification allotted extension of the test frequency (1.25 times the nominal test interval) would not be sufficient to facilitate diagnostics, instrument transport, repairs, calibration and re-installation and certification upon discovery that calibrated instruments are found to be deficient. Based on previous experience, there is reasonable assurance that unsatisfactory pump performance can be determined through the use of non-calibrated ultrasonic flow rate instruments when properly installed and verified in accordance with site specific procedures. An acceptable level of quality and safety is maintained and the use of this alternative would be a prudent action to take in the unlikely event of this emergent condition.

2.2.2 Alternative Testing

The licensee proposes:

Non-calibrated ultrasonic flow measuring instruments may be utilized to satisfy the requirements of the OM Code for pump flow rate determinations in the unlikely event that calibrated flow measuring instruments are not available.

2.2.3 Evaluation

At HBRSEP2, ultrasonic flow instruments are used to measure pump flow rate. These instruments are mounted externally, but calibration of these instruments cannot be accomplished onsite. For large bore pipes, the calibration vendor must arrange for the use of a special test facility. Experience has shown that the expected time period associated with obtaining an emergent instrument calibration is about 2 to 6 weeks and is largely dependent on events beyond the control of CP&L. In the unlikely event when calibrated instruments are rendered inoperable or are not available, the required pump tests may be interrupted for several weeks. Therefore, the licensee proposes to continue the pump test without interruption by using non-calibrated ultrasonic flow instruments, which will be properly installed and verified in accordance with site-specific procedures.

An IST pump test is normally performed quarterly and requires measurement of pressure, flow rate, speed, vibration, or differential pressure. When non-calibrated flow instruments are used, the test results cannot be properly compared to reference values or trended against previous ones. However, the combined test results of pressure, flow rate, speed, vibration and/or differential pressure can be analyzed to provide reasonable assurance of pump operability for a period of time until a calibrated instrument is available during the next required test. Therefore, in the unlikely event when calibrated instruments are rendered inoperable or are not available, a

one-time relief for using non-calibrated instruments may be acceptable because imposing the Code requirements would result in hardship for the licensee without a compensating increase in the level of quality and safety.

2.2.4 Conclusion

The alternative to use non-calibrated flow instruments in the unlikely event when calibrated instruments are rendered inoperable or are not available is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that imposing the Code requirements would result in hardship without a compensating increase in the level of quality and safety. However, this relief is not intended to be used repeatedly as a testing convenience. Efforts of obtaining an acceptable calibrated instrument for use during the next required pump tests must be made and documented for an onsite NRC review.

2.3 Relief Request IST-RR-3

The licensee has requested relief for Containment Spray (CS) Pumps A and B from ISTB 4.3(e)(1) requiring that the comprehensive test reference values be established within ±20% of the design flow rate.

2.3.1 Licensee's Basis for Requesting Relief

The licensee states:

> OM Code, ISTB 4.3.(e)(1), requires reference values to be established within ±20% of the pump design flow rate. The biennial Comprehensive Pump Tests for the CS pumps are conducted at flows less than 80% of pump design flow. For the CS pumps, the 80% design flow limit is 960 gpm. It is not practical to conduct the comprehensive test for the CS pumps with the reference value within 20% of the pump design flow for the following reasons:
>
> The CS pumps are tested using a test loop that circulates back to the Refueling Water Storage Tank. This flow path produces a flow rate of approximately 20% of the actual design flow. The only other CS system flow path available that can produce the required increase in flow would spray containment with a solution of Sodium Hydroxide and borated water. This would require an extensive cleanup and would be detrimental to carbon steel material and non-qualified electrical circuits. This method is not acceptable. Therefore, the ability to test to the design flow rate would require a substantial plant modification.

2.3.2 Alternative Testing

The licensee proposes:

> These pumps are classified as Group B pumps, and are subject to quarterly inservice tests where only differential pressure and flow rate [are] required to be monitored. HBRSEP, Unit No. 2 will conduct quarterly inservice tests monitoring the parameters (differential pressure, discharge pressure, flow rate and vibration) specified for a Group A Test. The additional vibration acceptance criteria will be limited as specified in Table

ISTB 5.2.1-1. In addition, the Comprehensive Test will be conducted at a flow rate less than 80% of the pump design flow rate. Based on information presented above, there is reasonable assurance that operational readiness of the CS pumps is maintained. The proposed alternative provides an acceptable level of quality and safety. Compliance with the Code requirement would result in an unusual hardship without a compensating increase in the level of quality and safety.

2.3.3 Evaluation

CS pumps are subject to quarterly Group B tests and a biennial comprehensive test. Differential pressure and flow rate are required to be monitored for a Group B test, but differential pressure, discharge pressure, flow rate and vibration are required for a comprehensive test. However, for a comprehensive test, OM Code, ISTB 4.3.(e)(1), requires reference values to be established within ±20% of the pump design flow. At HBRSEP2, the CS pumps can only be tested using a test loop that circulates back to the Refueling Water Storage Tank. This flow path produces a flow rate of approximately 20% of the actual design flow. The other CS system flow path available that can produce the required flow would spray containment with a solution of sodium hydroxide and borated water. This test would require an extensive post-test cleanup and would be detrimental to carbon steel material and non-qualified electrical circuits. As such, the licensee proposes to perform Group A pump tests quarterly for monitoring differential pressure, discharge pressure, flow rate, and vibration. The proposed test monitors discharge pressure and vibration more frequently than the Group B test required.

The comprehensive pump test required by the 1995 Edition and the 1996 Addenda of the OM Code would produce a more accurate evaluation of pump operability and performance characteristics at a reduced frequency. The test is intended to be conducted at or near the pump's design flow rate because this area of the pump curve is considered to be most representative of the pump design performance characteristics. On the other hand, the quarterly Group A or B test is primarily a qualitative test to allow for detection of grossly mechanical or hydraulic failures and not to assess hydraulic performance capabilities or detect minor imbalances through vibration measurements. Therefore, the staff does not find an adequate basis exists to authorize the alternative as proposed by the licensee.

At HBRSEP2, the only flow path available that can produce the required flow for the pump test would spray containment with a solution of sodium hydroxide and borated water. This test would require an extensive post-test cleanup and would be detrimental to carbon steel material and non-qualified electrical circuits. As such, the Code-required test cannot be performed without substantial plant modification. Considering that the plant modification would require time and planning as well as plant shutdown, and that the proposed alternative would provide reasonable assurance of pump operability without major degradations, relief request IST-RR-3 is authorized for an interim period until the end of Refueling Outage (RO)-22.

However, for the long-term assessment of the operational readiness of the pump (from RO-22 until the end of the fourth 10-year interval), it is necessary that a test be performed at or near the pump's design flow rate or where the pump design performance characteristics are well-represented. During the period of interim authorization, the licensee may wish to explore other possibilities for flow rate testing through alternative flow paths in order to achieve a flow test that will produce meaningful data.

2.3.4 Conclusion

Pursuant to 10 CFR 50.55a(f)(6), the alternative to perform a reduced flow but a more comprehensive quarterly test is authorized for an interim period until the end of RO-22 on the bases that the Code-required test is impractical to perform without significant plant modification, the interim alternative otherwise meets the criteria of 10 CFR 50.55a(f)(6)(i), and that the interim relief will allow time for the licensee to explore other alternatives, make necessary plant modification for performing the required test, or submit a revised relief request.

2.4 Relief Request IST-RR-4

The licensee has requested relief for all active manual valves from the test requirements of ISTC 4.2.1. The licensee proposes to exercise these valves at a frequency of 2 years.

2.4.1 Licensee's Basis for Requesting Relief

The licensee states:

> The ASME OM Code 1998 Edition/2000 Addenda, ISTC 3540, Manual Valves, has been revised to relax the full-stroke exercise requirements for manual valves to at least every 5 years. Based on plant specific inservice test results, HBRSEP, Unit No. 2 supports the industry accepted concept that manual valves have proven to be reliable with acceptable full stroke exercising tests at an extended interval. At this time, sufficient information is not available to support an extension to the 5 year frequency. Based on the data available, extension of the quarterly exercise test for these valves to an interval of two years is acceptable. The interval extension will reduce overall radiation exposure consistent with ALARA and focus resources on activities that will maximize safety system train availability. Based on the information above, operational readiness of active manual valves is maintained with the modified exercise frequency. The proposed alternative provides an acceptable level of quality and safety. Compliance with the Code requirement would result in an unnecessary burden without a compensating increase in the level of quality and safety. The proposed frequency is consistent with proposed rulemaking to adopt ASME OM Code 1998 Edition/2000 Addenda as published in *Federal Register* Vol. 66, P. 40626, dated August 3, 2001.

2.4.2 Alternative Testing

The licensee proposes:

> Active manual valves to be full-stroke exercised at a frequency of 2 years.

2.4.3 Evaluation

The Code requires that Category A and B valves be exercised to their safety position once every 3 months. In addition, power-operated valves are required to be stroke timed every 3 months unless this testing is impractical, and then deferred to either plant shutdowns or refueling outages. Active safety-related valves without power actuators that require a plant operator to turn a hand wheel or other device to actuate the valve to its safety position are referred to as manual valves. Manual valves are required to meet the Code exercise requirements. They are not required to meet the stroke-time testing requirements.

A manual valve, because it does not have an associated power actuator, is regarded as a relatively simple component with few potential degradation mechanisms. However, the valve body and internals of a manual valve are subject to the same degradation mechanisms as the valve body of a power-actuated valve, such as corrosion and binding of the valve internals. Generally, the exercising of a manual valve is a relatively simple inservice test to perform. It should provide assurance that the obturator can be moved to its safety position by a plant operator and has not corroded or been otherwise impaired in performing its function since the previous test was conducted.

The licensee proposes that active manual valves be full-stroke exercised at a frequency of 2 years. The proposed testing results in approximately an 85% reduction in the testing of the specified manual valves, and therefore a corresponding reduction in the burden of testing these valves, while performing an exercise test at a nominal interval of 2 years. This proposed test interval is consistent with the more simplistic Code testing requirements for valves (e.g., 2-year position indication verification). In addition, the test frequency is also consistent with allowed test frequency for testing of components that are impractical to perform at power and during cold shutdowns. The proposed alternative provides an acceptable level of quality and safety because of the reasons stated above. The 2-year test frequency also provides an acceptable level of quality and safety because it is recognized that, for most manual valves, a quarterly test frequency may not be necessary to provide assurance of operational readiness.

2.4.4 Conclusion

The proposed alternative for the active manual valves is authorized for the fourth 10-year interval pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety.

2.5 Relief Request IST-RR-5

The licensee has requested relief for all pressure relief devices from the test requirements of OM Code, Appendix I. Paragraph I-8.1.1(h) of Appendix I requires that a minimum of 10 minutes shall elapse between successive openings.

2.5.1 Licensee's Basis for Requesting Relief

The licensee states:

> ASME OM Code 1998 Edition/2000 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices, requires in paragraphs I-8110(h), I-8120(h) and I-8130(g) that a minimum of 5 minutes shall elapse between successive openings. As evidenced by the ASME Code Committee approval and NRC endorsement of the later Code edition, a reduction in the amount of time between successive openings during relief valve testing is not likely to reduce the overall accuracy, repeatability, or confidence of the set pressure test results. Relief Valve set pressure testing may be conducted during plant refueling outages or on line. By reducing the time between openings, the overall time required to perform the set pressure testing is reduced, which may help reduce the time required to conduct plant refueling outages or increase the availability of manpower to

perform other activities. Adaptation of the 5 minute interval between successive tests will also facilitate a more timely return to service of equipment essential for safe operation during any mode of operation. Based on the information above, there is reasonable assurance that operational readiness of pressure relief devices is maintained, and that an acceptable level of quality and safety is maintained. Compliance with the Code requirement would result in an unnecessary burden without a compensating increase in the level of quality and safety.

2.5.2 Alternative Testing

The licensee proposes:

> A minimum of 5 minutes shall elapse between successive openings during pressure relief device testing in accordance with ASME OM Code 1998 Edition/2000 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices.

2.5.3 Evaluation

The pressure relief devices function to provide overpressure protection to their associated systems. The OM Code, Appendix I, 8.1.1(h), 8.1.2(h), and 8.1.3(g), requires that a minimum of 10 minutes elapse between successive valve openings. The licensee proposes an alternative test method of which 5 minutes elapse between successive valve openings.

The staff finds that the proposed 5-minute hold time between consecutive set pressure tests for the pressure relief devices provides a suitable method to accurately and repeatedly establish set pressures. Based on a review of test data provided in a study conducted by the ASME OM Committee, the staff finds that the proposed 5-minute hold time provides the necessary steady-state thermal conditions for testings. The staff also notes that the licensee's proposal is consistent with a revision in the ASME OM Code 1998 Edition/2000 Addenda. The 1998 Edition/2000 Addenda specifies a 5-minute hold time, which is a relaxation of the 10-minute hold time specified in the 1995 Edition and the 1996 Addenda. Therefore, the staff finds the licensee's proposed method of set pressure testing with a 5-minute elapse time provides an acceptable level of quality and safety.

2.5.4 Conclusion

The proposed alternative of set pressure testing with a 5-minute elapse time is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternative provides an acceptable level of quality and safety.

2.6 Relief Request IST-RR-6

The licensee has requested relief from the requirements of ISTC 4.2.8(e), i.e., for valves stroking in less than 2 seconds, the maximum limiting stroke time shall be 2 seconds, and proposes to apply the requirements of ISTC 4.2.8(e) to valves that stroke in 5 seconds or less. However, in a letter dated February 22, 2002, the original relief request was revised, and relief was requested from the requirements of ISTC 4.2.8(d), i.e., other power-operated valves with reference stroke times of less than or equal to 10 seconds shall exhibit not more than ± 50%

change in stroke time when compared to the reference value. The licensee proposes a ±75% change in stroke time for certain valves with a reference stroke time of 4 seconds or less.

2.6.1 Licensee's Basis for Requesting Relief

The licensee states that the objective of the proposed acceptance criteria is to avoid unnecessary declaration of valve inoperability while maintaining appropriately conservative limiting acceptance criteria for this group of valves.

The licensee also states that based on a review of past data, application of the ASME OM 95/96 Code, ISTC 3.4, could have resulted in several circumstances of establishing post-maintenance test results as the new reference values for the associated valves. The lower reference stroke times associated with post-maintenance tests would have generated smaller acceptable time limit ranges, based on the allowable factors listed in the ASME OM 95/96 Code (i.e., ± 50% of the reference stroke time in accordance with ISTC 4.2.8). The smaller acceptable time limit ranges could have led subsequent declarations of valve inoperability or unnecessary retesting in accordance with ISTC 4.2.9. Therefore, the valve acceptance criteria proposed in IST-RR-6 will improve plant safety by reducing inappropriate declarations of valve inoperability and unnecessary maintenance and retesting.

2.6.2 Alternative Testing

The licensee proposes a revised acceptance criterion of a ±75% change (versus ± 50% required by OM Code) in stroke time for certain containment isolation valves with a reference stroke time of 4 seconds or less.

2.6.3 Evaluation

ISTC 4.2.8(d) of OM Code requires that power-operated valves with reference stroke times of less than or equal to 10 seconds shall exhibit not more than ± 50% change in stroke time when compared to the reference value. The licensee proposes ±75% change in stroke time for certain power-operated valves with a reference stroke time of 4 seconds or less.

The licensee proposes the change because an increase in the allowable change in stroke time would reduce the number of valve test failures, and therefore, reduce valve maintenance and retesting. However, an increase of the allowable change from ± 50% to ±75% in stroke time would allow valve degradation by additional 50 percent, and therefore reduce the safety margin of the valve operability. The licensee has not provided any test data or technical information to demonstrate that a valve with a change of ±75% in stroke time would still remain operable until the next test. In addition, a review of past data provided by the licensee indicates that the application of the ± 50% range has not resulted in any unacceptable or high number of test failures. In fact, the test failures are very low, and the likely cause of test failure may be attributed to poor communications between testing personnel or methods of testing rather than the allowable range in stroke time. Therefore, the staff finds the proposed increase of stroke time change unacceptable.

2.6.4 Conclusion

Based on the evaluation above, relief request IST-RR-6 is denied. Consistent with the guidance provided in Section 3.1.1 of NUREG-1482, the Code-required test may be performed at cold shutdowns or refueling outages as permitted by the OM Code when exercising is impractical.

2.7 Relief Request IST-RR-7

The licensee has requested relief for check valves installed in the isolation valve seal water (IVSW) system from the requirements of ISTC 4.5.4(a)(2) of the OM Code to verify closure or from the requirements of ISTC 4.5.4(c) to verify closure by a sample disassembly program. The check valves will be forward flow tested and closure verification will not be performed.

2.7.1 Licensee's Basis for Requesting Relief

The licensee states:

> The 3/8 inch penetration check valves in the IVSW system have no safety function in the closed direction and are required to open in order to provide seal water to selected containment penetrations during a Design Basis Accident (DBA). The IVSW system operates to limit the release of fission products should leakage occur; however, no credit is actually taken for its operation when calculating offsite accident dose. The system has been formally accepted as a qualified seal water system pursuant to 10 CFR 50 Appendix J requirements. IVSW is maintained at a minimum pressure of 1.1 times the peak accident pressure related to the design basis loss of coolant accident. As such, the design and qualification of the system eliminates the need for these valves to close during a DBA in the unlikely event that closure is required.
>
> Disassembly to verify obturator closure or modifications to facilitate testing for closure are impractical based on the large number of valves requiring verification and the insignificance associated with their failure to close. Disassembly may also lead to maintenance-induced errors associated with re-assembly. The small size and construction of these valves prohibits the ability to perform partial disassembly/inspection in a manner representative of its inservice condition (e.g., valve removal and decontamination activities could alter disc position). IVSW is a standy system that is typically operated during refueling outages to facilitate testing. Based on infrequent use, the valve obturator exhibits minimal wear. Bi-directional check valve testing was adopted to counter the effects of a faulty test strategy associated with the inability to detect a detached valve disc. Specifically, a satisfactory forward flow check valve test could be completed when the valve disc is actually detached and laying in the bottom of the valve body. Based on the design and materials of construction associated with these check valves, disc failure with subsequent migration into associated systems is not likely. The size of the disc exceeds the inner diameter of the valve outlet. It is likely that failure of the valve in this manner would be detected by the current test method which, is performed at refueling outages in conjunction with required Appendix J leak rate testing of the associated containment penetration. Forward flow testing at a refueling interval is warranted since the test boundary must be depressurized to perform leak rate testing. Depressurization of the boundary is assured during the leak rate test

conducted at refueling intervals. The location of these valves would make testing, inspection or examination for closure inconsistent with ALARA principles.

Based on the design and qualification of this system, compliance with the Code requirement would result in an unusual hardship without a compensating increase in the level of quality and safety. The proposed alternative provides an acceptable level of quality and safety.

2.7.2 Alternative Testing

The licensee proposes:

The 3/8-inch penetration check valves installed in the IVSW system will be tested to the open position at refueling intervals. Closure verification will not be performed.

2.7.3 Evaluation

ISTC 4.5.4(a)(2) requires closure verification of check valves that only have a safety function in the open direction, and ISTC 4.5.4(c) requires closure verification for certain check valves by a sample disassembly program if other test methods are impractical. A closure test is used to verify the integrity of the valve and that the check valve is still in place and remains intact.

The check valves installed in the IVSW system have no safety function in the closed direction and are required to open to provide seal water to selected containment penetrations during a DBA. The IVSW system operates to limit the release of fission products should leakage occur; however, no credit is taken for its operation when calculating offsite accident dose. IVSW is maintained at a minimum pressure of 1.1 times the peak accident pressure related to the design-basis loss-of-coolant accident (LOCA).

Currently, these valves are inspected by a sample disassembly program to verify obturator closure. The licensee states that disassembly to verify obturator closure is impractical based on the large number of valves requiring verification. Disassembly may also lead to maintenance-induced errors associated with re-assembly. The small size and construction of these valves prohibits the ability to perform partial disassembly/inspection in a manner representative of its inservice condition (e.g., valve removal and decontamination activities could alter disc position). The licensee also states that based on the design and materials of construction associated with these check valves, disc failure with subsequent migration into associated systems is unlikely.

The check valves in the IVSW are not conventional swing check valves. They are on-line spring-loaded ball check valves. The staff has reviewed the valve design and configuration and finds that the likely mode of failure is leakage through the valve seat. Because of the valve's unique design, failure of the ball-shaped disc would not result in subsequent migration into associated systems, and therefore would not adversely impact the safety function of the IVSW system. In addition, IVSW is maintained at a minimum pressure of 1.1 times the peak calculated containment accident pressure related to the design-basis LOCA. Therefore, containment out-leakage will be prevented when the IVSW system is in operation following a LOCA. Incomplete valve closure or leakage will also be detected by pressure and water level instruments associated with the seal water injection tank. As a result, closure verification by a

sample disassembly program of these valves is unnecessary and would only result in hardship without a compensating increase in the level of quality and safety. Therefore, the staff finds the proposal of testing the affected valves to only the open position is acceptable.

2.7.4 Conclusion

The relief request of testing the check valves in the IVSW system to their open position is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety.

3.0 CONCLUSION

Pursuant to 10 CFR 50.55a(a)(3)(i), relief requests IST-RR-1, -4, -5, and -7 are authorized based on an acceptable level of quality and safety that will be provided by the alternatives. Pursuant to 10 CFR 50.55a(a)(3)(ii), relief request IST-RR-2 is authorized on the basis that compliance with the specified Code requirements would result in hardship without a compensating increase in the level of quality and safety. Pursuant to 10 CFR 50.55a(f)(6), relief request IST-RR-3 is authorized for an interim period until the end of RO-22 on the basis that the Code-required test is impractical to perform without significant plant modification, and that otherwise the criteria of 10 CFR 50.55a(f)(6)(i) is met. Relief request IST-RR-6 is denied, but the Code-required test may be performed at cold shutdown or refueling outage as permitted by the OM Code when the test is impractical.

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Date: June 27, 2002

Summary of Relief Requests
H. B. Robinson Steam Electric Plant, Unit 2

Relief Request No.	10 CFR 50.55a - ASME Code Section	Issue Identification	Alternatives authorized in accordance with 10 CFR 50.55a
IST-RR-1	OM Code, ISTA 1.5 and ISTA 2.1	Access provisions for the AISI be eliminated	Authorized in accordance with (a)(3)(i)
IST-RR-2	OM Code Table ISTB 4.7.1	Use non-calibrated ultrasonic flow measuring instruments	Authorized in accordance with (a)(3)(ii)
IST-RR-3	OM Code ISTB 4.3(e)(1)	Comprehensive test reference values be established within ±20% of the design flow rate	Authorized for interim period until the end of RO-22, in accordance with (f)(6)
IST-RR-4	OM Code ISTC 4.2.1	Manual valves to be full-stroke exercised at a frequency of 2 years instead of 3 months	Authorized in accordance with (a)(3)(i)
IST-RR-5	OM Code, Appendix I. Paragraph I-8.1.1(h)	Time Lapse between successive openings during testing of pressure relief devices	Authorized in accordance with (a)(3)(i)
IST-RR-6	OM Code ISTC 4.2.8(d)	The maximum limiting valve stroke time for valves with a reference stroke time of 4 seconds or less	Denied; the test may be performed in accordance with the guidance provided in Section 3.1.1 of NUREG-1482
IST-RR-7	OM Code ISTC 4.5.4(a)(2) or ISTC 4.5.4(c)	To verify closure by a sample disassembly program for check valves in the IVSW system	Authorized in accordance with(a)(3)(i)