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SAFETY EVALUATION REPORT, INSERVICE TESTING PROGRAM, WILLIAM H. ZIMMER NUCLEAR STATION, UNIT 1

W. H. Hubble
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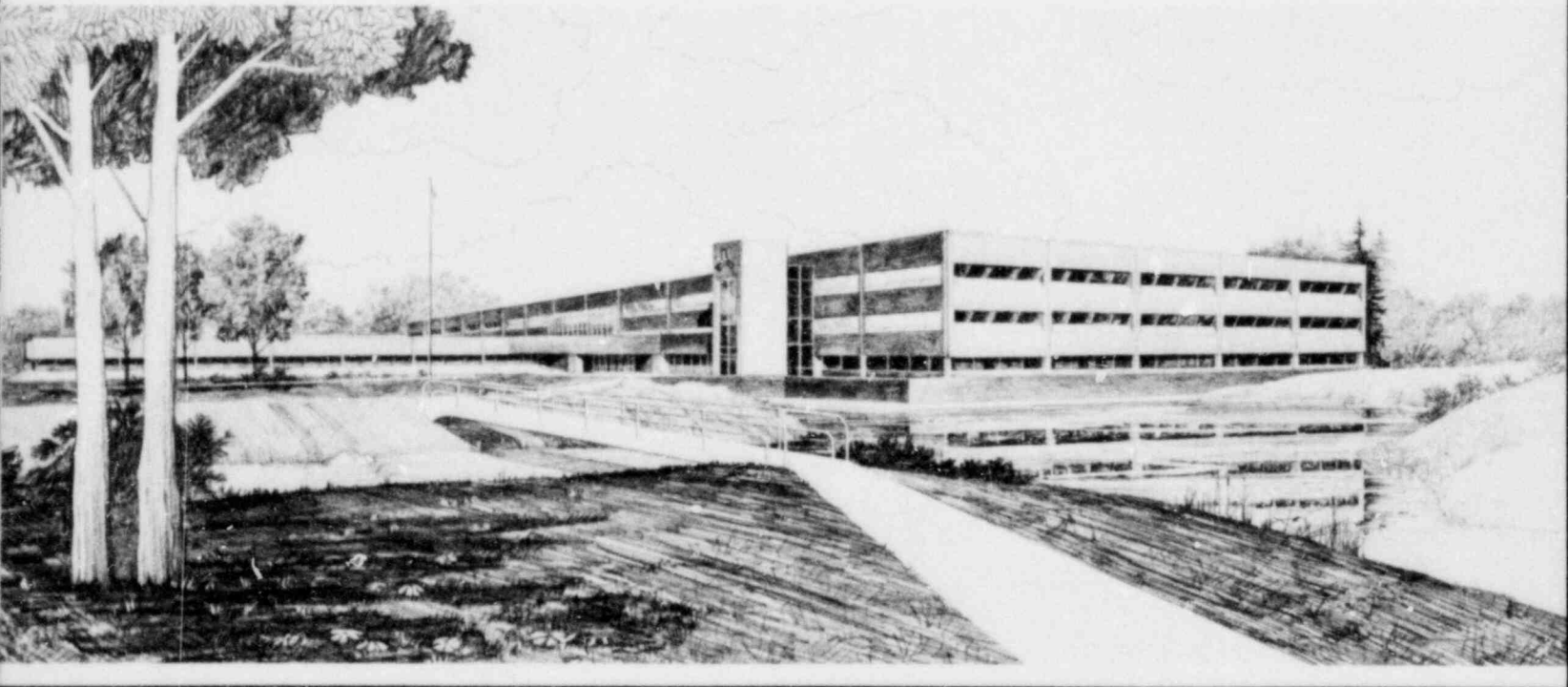
NRC Research and/or Technical Assistance Report

U.S. Department of Energy
Idaho Operations Office • Idaho National Engineering Laboratory



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W. H. Hubble
H. C. Rockhold
Reliability and Statistics Branch
Engineering Analysis Division
EG&G Idaho, Inc.

Docket No. 50-358

ABSTRACT

This EG&G Idaho, Inc. report presents the results of our evaluation of the William H. Zimmer Nuclear Station, Unit 1, Inservice Testing Program for safety-related pumps and valves.

FOREWORD

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

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I. INTRODUCTION

Contained herein is a safety evaluation of the pump and valve inservice testing (IST) program submitted by the Cincinnati Gas and Electric Company (CG&E) for its William H. Zimmer Nuclear Station Unit 1.

The working session with CG&E and William H. Zimmer Unit 1 representatives was conducted on July 14 and 15, 1981. The licensee resubmittal was received by EG&G Idaho, Inc., on November 6, 1981, and reviewed to verify compliance of proposed tests of safety-related Class 1, 2, and 3 pumps and valves with requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, through the Summer of 1978 Addenda. CG&E has also requested relief from the ASME Code from testing specified pumps and valves because of practical reasons. These requests have been evaluated individually to determine whether they have significant risk implications and whether the tests, as required, are indeed impractical.

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

A summary of valve testing requirements is provided in Appendix A.

Appendix J exemption requests for Category A valves that should be reviewed by the NRC are contained in Attachment I.

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

A listing of P&IDs used for this review are contained in Attachment III.

Valves that are not included in the IST program, which we feel should be further reviewed to see if they perform a safety related function, and a discussion on the Spent Fuel Pool Cooling System are contained in Attachment IV.

Items discussed via telephone after the IST meeting with the licensee that result in changes to their program and may appear as differences between their IST program and this report are detailed in Attachment V.

II. PUMP TESTING PROGRAM

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

1. Safety-Related Pumps

1.1 Relief Request. Relief is requested from the Section XI requirements of measuring bearing temperatures on the standby liquid control pumps.

1.1.1 Code Requirement. IWP-4310 states, "The temperature of all centrifugal pump bearings outside the main flow path and of the main shaft bearings of reciprocating pumps shall be measured at points selected to be responsive to changes in the temperature of the bearing. Lubricant temperature, when measured after passing through the bearing, and prior to entering a cooler, shall be considered the bearing temperature."

1.1.2 Licensee's Basis for Requesting Relief. The standby liquid control pump bearings have no installed temperature instrumentation available to measure temperature and the bearings are inaccessable for using hand held pyrometers.

1.1.3 Evaluation. The licensee has demonstrated that the standby liquid control pump bearings do not have installed instrumentation and are inaccessable for using portable instrumentation to measure bearing temperature. Therefore, we feel relief should be granted from the requirements of Section XI for measurement of pump bearing temperatures.

1.2 Relief Request. Relief is requested from the Section XI requirements of measuring inlet and differential pressure for the standby liquid control pumps.

1.2.1 Code Requirement. IWP-3300 states, "Each inservice test shall include the measurement and observation of all quantities in Table IWP-3100-1 except bearing temperatures, which shall be measured during at least one inservice test each year." Table IWP-3100-1 requires measurement of both inlet and differential pressure.

1.2.2 Licensee's Basis for Requesting Relief. Inlet pressure is not available for these pumps when in test lineup for measurement of flow by change of test tank level. Instead of measured value, adequate suction supply shall be verified. Since inlet pressure is not available, the parameter ΔP (differential pressure) shall be replaced with discharge pressure. The evaluation required on ΔP by ASME code shall be applied to discharge pressure. Since these pumps are positive displacement pumps, pumping water,

the monitoring of discharge pressure instead of ΔP is just as effective for pump performance evaluation.

1.2.3 Evaluation. The licensee has demonstrated that the standby liquid control pumps do not have installed instrumentation for measuring inlet pressure when in the test lineup for measurement of flow by change of test tank level. Without inlet pressure, they are also unable to obtain a value for differential pressure. Therefore, we feel relief should be granted from the requirements of Section XI for measurement of pump inlet and differential pressure. We feel that the proposed alternate method of verifying adequate suction supply and monitoring discharge pressure instead of differential pressure will adequately demonstrate proper pump operability of these positive displacement pumps.

III. VALVE TESTING PROGRAM EVALUATION

The IST program submitted by Wm. H. Zimmer, Unit 1 was examined to verify that Class 1, 2, and 3 safety-related valves were included in the program and that those valves are subjected to the periodic tests required by the ASME Code, Section XI, and the NRC positions and guidelines. Our review found that all Class 1, 2, and 3 safety-related valves were included in the IST program and, except for those valves identified below for which specific relief from testing has been requested, the valve tests and frequency of testing comply with the code requirements and the NRC positions and guidelines listed in Section 1. Each Wm. H. Zimmer, Unit 1 basis for requesting specific relief from testing valves and the EG&G evaluation of that request is summarized below and grouped according to each specific system.

1. General Considerations

1.1 Stroke Testing of Check Valves

The NRC stated its position to the licensee that check valves whose safety function is to open are expected to be full stroked. If only limited operation is possible (and it has been demonstrated by the licensee and agreed to by the NRC), the check valve shall be partial stroked. Since disk position is not always observable, the NRC staff stated that verification of the plant's safety analysis design flow rate through the check valve would be an adequate demonstration of the full stroke requirement. Any flow rate less than design will be considered part stroke exercising unless it can be shown that the check valve's disk position at the lower flow rate would be equivalent to or greater than the design flow rate through the valve. The licensee agreed to conduct flow tests to satisfy the above position.

1.2 Licensee Request for Relief to Test Valves at Cold Shutdowns

The Code permits valves to be tested at cold shutdowns, and the conditions under which this is permitted are noted in Appendix A. These valves are specifically identified by the licensee and are full stroke exercised during cold shutdowns; therefore, the licensee is meeting the requirments of the ASME Code. Since the licensee is meeting the requirements of the ASME Code, it will not be necessary to grant relief; however, during our review of the licensee's IST program, we have verified that it was not practical to exercise these valves during power operation and that we agree with the licensee's basis. It should be noted that the NRC differentiates, for valve testing purposes, between the cold-shutdown mode and the refueling mode. That is, for testing purposes, the refueling mode is not considered as a cold shutdown.

1.3 Technical Specification Changes

In an NRC letter dated November 1976, the NRC provided an attachment entitled, "NRC Guidelines for Excluding Exercising (Cycling) Tests of Certain Valves During Plant Operation." The attachment stated that, when one train of a redundant system such as the Emergency Core Cooling System (ECCS)

is inoperable, nonredundant valves in the remaining train should not be cycled if their failure in a non-safe position would cause a loss of total system function. For example, during power operation in some plants, there are stated minimum requirements for systems which allow certain limiting conditions for operation to exist at any one time and, if the system is not restored to meet the requirements within the time period specified in the plant's Technical Specifications (T.S.), the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs, all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For some plants, this situation could be contrary to the NRC guideline as stated in the document mentioned above. It should be noted that a reduction in redundancy is not a basis for a T.S. change nor is it by itself a basis for relief from exercising in accordance with Section XI. The licensee has agreed to review the plant's T.S. and to consider the need to propose T.S. changes which would have the effect of precluding such testing. After making this review, if the licensee determines that the T.S. should be changed because the guidelines are applicable, the licensee will submit to the NRC, in conjunction with the proposed T.S. change, the inoperable condition for each system that is affected which demonstrates that the valve's failure would cause a loss of system function or if the licensee determined that the T.S. should not be changed because the guidelines are not applicable or cannot be followed, the licensee will submit the reasons that led to their determination for each potentially affected section of the T.S.

1.4 Safety-Related Valves

This review was limited to safety-related valves. Safety-related valves are defined as those valves that are needed to mitigate the consequences of an accident and/or to shut down the reactor and to maintain the reactor in a shutdown condition. Valves in this category would typically include certain ASME Code Class 1, 2, and 3 valves and could include some non-code class valves. It should be noted that the licensee may have included non-safety-related valves in their IST program as a decision on the licensee's part to expand the scope of their program.

1.5 Valve Testing at Cold Shutdowns

Inservice valve testing at cold shutdowns is acceptable when the following conditions are met:

1. It is understood that the licensee is to commence testing as soon as the cold-shutdown condition is achieved, but not later than 48 hours after shutdown, and continue until complete or the plant is ready to return to power.

2. Completion of all valve testing is not a prerequisite to return to power.

3. Any testing not completed at one cold shutdown should be performed during any subsequent cold shutdowns that may occur before refueling to meet the code-specified testing frequency.

4. For planned cold shutdowns, where the licensee will complete all the valves identified in this IST program for testing in the cold-shutdown mode, exceptions to the 48 hours may be taken.

1.6 Category A Valve Leak Check Requirements for Containment Isolation Valves (CIVs)

All CIVs shall be classified as Category A valves. The Category A valve-leak-rate test requirements of IWV-3420 have been superseded by Appendix J requirements for CIVs. The NRC has concluded that the applicable leak-test procedures and requirements for CIVs are determined by 10 CFR 50, Appendix J. Relief from Paragraph IWV-3420 for CIVs presents no safety probelm since the intent of IWV-3420 is met by Appendix J requirements.

1.7 Application of Appendix J Testing to the IST Program

The Appendix J review for this plant is a completely separate review from the IST program review. However, the determinations made by that review are directly applicable to the IST program. Our review has determined that the current IST program as submitted by the licensee correctly reflects the NRC's interpretation of Section XI vis-a-vis Appendix J. The licensee has agreed that, should the Appendix J program be amended, they will amend their IST program accordingly.

2. Generic Relief Request

2.1 Category A and B Valves

2.1.1 Relief Request. Relief is requested from the requirements of Section XI, Article IWV-3413(c), for power-operated valves with stroke times of less than 5 seconds and from using previous test stroke time values for power-operated valves with stroke times greater than 5 seconds.

2.1.1.1 Code Requirement. IWV-3413(c) states, "If an increase in stroke time of 25% or more from the previous test for valves with stroke times greater than 10 sec, or 50% or more for valves with stroke times less than or equal to 10 sec, is observed, test frequency shall be increased to once each month until corrective action is taken, at which time the original test frequency shall be resumed. In any case, any abnormality or erratic action shall be reported."

2.1.1.2 Licensee's Basis for Requesting Relief. For valves with baseline stroke times of less than 5 seconds trend analysis shall not be performed. For valves with baseline stroke times of greater than 5 seconds trend analysis shall be performed using baseline stroke time as reference value rather than previous test stroke time values as required by Section IWV-3413(c).

2.1.1.3 Evaluation. Stroke timing of rapid-acting, power-operated valves whose stroke times are less than 5 seconds, would produce no meaningful data since these stroke times are extremely rapid and subject to considerable variation. For power-operated valves with stroke times of

5 seconds or more, the use of the baseline stroke time rather than the previous test stroke time gives a more representative analysis of the actual component degradation. Therefore, we feel relief should be granted from the stroke timing requirements of Section XI for these valves.

3. Main Steam/Feedwater Systems

3.1 Category A/C Valves

3.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves B21F010A and B, inside containment isolation feed water check valves.

3.1.1.1 Code Requirement. Refer to Appendix A.

3.1.1.2 Licensee's Basis for Requesting Relief. Exercising these valves would require interruption of reactor feedwater flow. Also adequate indication of valve position is not available to verify closure during shutdown conditions. An indication of adequate operability of the valves will be provided by the leak rate testing performed to meet the requirements of 10 CFR 50 Appendix J.

3.1.1.3 Evaluation. The licensee has demonstrated that valve closure during power operations would result in interruption of reactor feedwater flow. This, in turn, could result in a reactor trip. Additionally, during cold shutdown, the only practical way to verify valve closure (the safety-related position) would be to perform a leak rate test. Since leak rate testing is required to be performed during refueling outages by 10 CFR 50 Appendix J, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's proposed alternate test of verifying valve closure by leak rate testing in accordance with 10 CFR 50 Appendix J during refueling outages will adequately demonstrate proper valve operability.

3.2 Category B/C Valves

3.2.1 Relief Request. Relief is requested from the exercisng requirement of Section XI for valves 1B21F013B, C, F, G, K, and L, ADS/Relief Valves.

3.2.1.1 Code Requirement. Refer to Appendix A.

3.2.1.2 Licensee's Basis for Requesting Relief. These valves are not to be cycled during power operation to preclude the possiblity of a LOCA if the valves were to fail open. In addition, cycle time is a function of reactor pressure and therefore shall not be measured during exercise testing. These relief valves shall be full stroke exercised during cold shutdown or at conditions required by Technical Specification 3/4.5.1. Full stroke exercising shall be on a frequency determined by the following intervals between shutdowns as follows: For intervals of 3 months or longer exercise during shutdown; for intervals of less than 3 months, exercising is not required unless 3 months have passed since previous test completion.

3.2.1.3 Evaluation. The licensee has demonstrated that these valves cannot be full stroke exercised during power operation since a failure of any of these valves in the open position could result in a LOCA. Additionally, since cycle time is dependent on reactor pressure, no meaningful data would be obtained by measuring cycle times. Therefore, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's proposed alternate test of full stroke exercising during cold shutdown or at conditions required by Technical Specification 3/4.5.1 will adequately demonstrate proper valve operability.

4. Service Water System

4.1 Category B Valves

4.1.1 Relief Request. Relief is requested from the stroke-time requirements of Section XI for valves WS020, 025, and 030, service water temperature control valves on the outlet of the RBCCW heat exchangers.

4.1.1.1 Code Requirement. Refer to Appendix A.

4.1.1.2 Licensee's Basis for Requesting Relief. These valves are temperature control valves and therefore cycle times are meaningless, and full cycle testing is impractical, since valves are never in the closed position during any plant mode of operation. During accident conditions the function of these valves would be to fail open. Therefore adequate operability can be shown by fail safe testing. These valves shall be fail safe tested per section IWV-3515 of Section XI of the ASME Code. The test frequency shall be quarterly.

4.1.1.3 Evaluation. These valves are modulating control valves on the outlet side of the RBCCW heat exchangers. Since these valves are required to be in various positions during operation, depending on system temperature, a meaningful cycle time cannot be obtained. Therefore, we feel relief should be granted from the cycle time requirements of Section XI for these valves. We feel the licensee's proposed alternate test of fail safe testing the valves in accordance with Section IWV-3515 of Section XI of the ASME Code will adequately demonstrate proper valve operability.

5. Reactor Recirculation System

5.1 Category A/C Valves

5.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves 1B33F013A & B and 1B33F017A & B, inside and outside containment isolation check valves in the seal purge lines for the Reactor Recirculation Pump Seals.

5.1.1.1 Code Requirement. Refer to Appendix A.

5.1.1.2 Licensee's Basis for Requesting Relief. Closing these valves isolates cooling flow to Reactor Recirculation Pump Seal which could cause seal degradation. Also, adequate indication is not available to show

that the valve is closed during shutdown conditions. Adequate indication of operability will be provided by leak rate testing performed to meet the requirements of 10 CFR 50 Appendix J.

5.1.1.3 Evaluation. The licensee has demonstrated that closure of these valves during power operation could result in damage to the reactor recirculation pumps which could result in a reactor trip. Additionally, during cold shutdown, the only practical way to verify valve closure (the safety-related position) would be to perform a leak rate test. Since leak rate testing is required to be performed during refueling outages by 10 CFR 50 Appendix J, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's proposed alternate test of verifying valve closure by leak rate testing in accordance with 10 CFR 50 Appendix J during refueling outages will adequately demonstrate proper valve operability.

6. Reactor Core Isolation Cooling System

6.1 Category A/C Valves

6.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valve E51F065, RCIC system check valve to the reactor vessel.

6.1.1.1 Code Requirement. Refer to Appendix A.

6.1.1.2 Licensee's Basis for Requesting Relief. Injection of water through this valve quarterly during power operation increases the thermal stress cycles on this piping and would increase failure probability. Injection cannot be performed during shutdown conditions since the pump is not operable. This valve shall be cycled open when reactor pressure is greater than 150 PSIG but less than 165 PSIG. Exercise testing shall be done during the above condition at a frequency determined by the following intervals:

1. For intervals >3 months, exercise prior to power operation.

2. For intervals <3 months, exercise prior to power operation only if 3 months have passed since last exercise performance.

6.1.1.3 Evaluation. The licensee has demonstrated that this valve cannot be exercised quarterly during power operations since injection of water through this valve increases the thermal stress cycles on the injection nozzle and piping, possibly resulting in premature failure. Also, exercising cannot be performed during cold shutdown conditions since the RCIC pump/turbine is not operable. Therefore, we feel relief should be granted from the exercising requirements of Section XI for this valve. We feel the licensee's proposed alternate test of exercising the valve when reactor pressure is greater than 150 PSIG but less than 165 PSIG (i.e. when approaching cold shutdown condition or during startup from a cold shutdown), will adequately demonstrate proper valve operability.

6.2 Category C Valves

6.2.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valve E51F030, RCIC pump suction check from the Suppression Pool.

6.2.1.1 Code Requirement. Refer to Appendix A.

6.2.1.2 Licensee's Basis for Requesting Relief. Full-stroke exercising of this valve would require injection of high contaminated water (suppression pool) into low contaminated systems (reactor vessel or condensate storage tanks). Also, this system is only operable when reactor pressure is greater than 150 PSIG. This valve shall be partial-stroke exercised every 3 months when reactor pressure is greater than 150 PSIG and shall be physically inspected every refueling outage.

6.2.1.3 Evaluation. The licensee has demonstrated that this valve cannot be full-stroke exercised quarterly during power operations or during cold shutdowns, since full flow injection of water through this valve would result in introducing possibly contaminated water to either the reactor vessel or the condensate storage tanks. Therefore, we feel relief should be granted from the exercising requirements of Section XI for this valve. We feel the licensee's proposed alternate test of partial-stroke exercising the valve quarterly with flow and disassembling the valve for inspection during refueling outages will adequately demonstrate valve operability.

7. Control Rod Drive Hydraulic System

7.1 Category B Valves

7.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves C11D001-126 and 127 (137 valves each), individual control rod scram supply and discharge header control valves.

7.1.1.1 Code Requirement. Refer to Appendix A.

7.1.1.2 Licensee's Basis for Requesting Relief. The operability of the control rods which requires the operability of these valves is adequately tested by performance of Technical Specification Surveilance Requirement 3/4.1.3.2. This Technical Specification Surveillance requires testing of at least 10% of the control rods, on a rotating basis, at least once per 120 days, all rods after core alteration or when the reactor is shutdown greater than 120 days, and whenever maintenance is performed on a control rod.

7.1.1.3 Evaluation. The licensee has demonstrated that the operabilty of these valves is verified when the individual control rod scram times are verified by the performance of Technical Specification Surveillance Requirement 3/4.1.3.2. Therefore, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's alternate test of exercising these valves when

control rod operability is verified per Technical Specifications will adequately demonstrate proper valve operability.

7.2 Category C Valves

7.2.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves C11D001-114 (137 valves), individual control rod scram discharge header check valves.

7.2.1.1 Code Requirement. Refer to Appendix A.

7.2.1.2 Licensee's Basis for Requesting Relief. The operability of the control rods which requires the operability of these valves is adequately tested by performance of Technical Specification Surveilance Requirement 3/4.1.3.2. This Technical Specification Surveillance requires testing of at least 10% of the control rods, on a rotating basis, at least once per 120 days, all rods after core alteration or when the reactor is shutdown greater than 120 days, and whenever maintenance is performed on a control rod.

7.2.1.3 Evaluation. The licensee has demonstrated that the operabilty of these valves is verified when the individual control rod scram times are verified by the performance of Technical Specification Surveillance Requirement 3/4.1.3.2. Therefore, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's alternate test of exercising these valves when control rod operability is verified will adequately demonstrate proper valve operability.

8. Standby Liquid Control System

8.1 Category A/C Valves

8.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves C41F006 and 007, SBLC system check valve isolations to the nuclear boiler system.

8.1.1.1 Code Requirement. Refer to Appendix A.

8.1.1.2 Licensee's Basis for Requesting Relief. Sufficient flow to indicate correct valve operation can only be obtained by system initiation which requires actuation of an explosive valve and injection to the reactor vessel. This valve shall be exercised once every eighteen months during the Standby Liquid Control System flow test as required by plant Technical Specifications.

8.1.1.3 Evaluation. The licensee has demonstrated that these valves cannot be full stroke exercised during power operation or cold shutdown since this would require SBLC system initation, which would include actuation of the explosive valves and injection of concentrated boric acid into the reactor vessel. Therefore, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's alternate test of full stroke exercising once every eighteen

months during the SBLC system flow test will adequately demonstrate proper valve operability.

9. Primary Containment Ventilation Chilled Water System

9.1 Category A/C Valves

9.1.1 Relief Request. Relief is requested from the exercising requirements of Section XI for valves 1VP068A and B, inside containment isolation check valves.

9.1.1.1 Code Requirement. Refer to Appendix A.

9.1.1.2 Licensee's Basis for Requesting Relief. The system as designed does not provide a method to verify valve closure. Adequate indication of operability will be provided by leak rate testing performed every 18 months to meet the requirements of 10 CFR 50 Appendix J.

9.1.1.3 Evaluation. The licensee has demonstrated that during power operation and cold shutdowns, the only practical way to verify valve closure (the safety-related position) would be to perform a leak rate test. Since leak rate testing is required to be performed during refueling outages by 10 CFR 50 Appendix J, we feel relief should be granted from the exercising requirements of Section XI for these valves. We feel the licensee's proposed alternate test of verifying valve closure by leak rate testing in accordance with 10 CFR 50 Appendix J will adequately demonstrate valve operability.

IV. APPENDIX A

1. Code Requirement--Valves

Subsection IWV-3411 of the 1977 Edition of the Section XI ASME Code (which discusses full stroke and partial stroke requirements) requires that Code Category A and B valves be exercised once every three months, with exceptions as defined in IWV-3412(a), IWV-3415, and IWV-3416. IWV-3521 (which discusses full stroke and partial stroke requirements) requires that Code Category C valves be exercised once every three months, with exceptions as defined in IWV-3522. In the above cases of exceptions, the Code permits the valves to be tested at cold shutdown where:

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

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

Subsection IWV-3413(c) requires all Category A and B power-operated valves to be stroke-time tested to the nearest second or 10% of the maximum allowable owner-specified time.

V. ATTACHMENT I

During the course of our review of the Wm. H. Zimmer, Unit 1 IST program we found no valves that need further review by the NRC Appendix J review committee.

VI. ATTACHMENT II

The following are Category A, B, and C valves that meet the requirements of the ASME Code, Section XI, and are not full stroke exercised every three months during plant operation. These valves are specifically identified by the owner and are full stroke exercised during cold shutdowns and refueling outages. EG&G has reviewed all valves in this attachment and agrees with the licensee that testing these valves during power operation is not possible, due to the valve type and location, system design, or because this action could place the plant in an unsafe condition. We feel these valves should not be exercised during power operation. These valves are listed below and grouped according to the system in which tney are located.

1. Feedwater System

1.1 Cateogry A Valves

B21F065A and B, feedwater isolation valves to the reactor pressure vessel, cannot be exercised during power operation since closure of a valve would result in interruption of reactor feedwater flow, which could result in a reactor trip. These valves will be full stroke exercised during cold shutdowns and refueling outages.

2. Service Water System

2.1 Category B Valves

WS033A, 33B, 34A, and 34B, non-essential service water headers isolation valves, cannot be exercised during power operation. Isolation of one of the non-essential service water headers could result in either reduced capabilities or damage to the following equipment, which might result in a reactor trip:

Turbine oil coolers 1A and 1B

Turbine Building Component Cooling Water Heat Exchangers

Generator Hydrogen Coolers.

These valves will be full stroke exercised during cold shutdowns and refueling outages.

3. Drywell Pneumatic System

3.1 Category A Valves

IN061, air supply line isolation to containment, cannot be exercised during power operation since the closure of this valve would result in isolation of the air supply to the valves supplying cooling flow to the reactor recirculation pump motor cooler and seal cavity number 2 leak-off. The loss of the reactor recirculation pump could result in a reactor trip. This valve will be full stroke exercised during cold shutdowns and refueling outages.

4. Residual Heat Removal System

4.1 Category A and A/C Valves

E12F050A and B, RHR injection to reactor recirculation check valves, cannot be exercised during power operation because the RHR pumps cannot overcome reactor system pressure. Additionally, the operators for these valves have a safety interlock which does not permit the valves to open when the reactor is at normal operating pressure. These valves will be full stroke exercised during cold shutdowns and refueling outages.

E12F053A and B, RHR injection isolations to the reactor recirculation system, cannot be exercised during power operation because these valves have a safety interlock which does not permit the valves to open when the reactor is at normal operating pressure. These valves will be full stroke exercised during cold shutdowns and refueling outages.

E12F008 and 9, RHR suction isolations from the reactor recirculation system, cannot be exercised during power operation because these valves have a safety interlock which does not permit the valves to open when the reactor is at normal operating pressure. These valves will be full stroke exercised during cold shutdowns and refueling outages.

5. Reactor Building Closed Cooling Water System

5.1 Category A Valves

WR054 and WR055, Reactor Building Closed Cooling Water inlet and outlet containment isolation valves for the cooling water to the reactor recirculation pumps, cannot be exercised during power operation since closure of these valves could result in damage to the reactor recirculation pumps. The loss of the reactor recirculation pumps could result in a reactor trip. These valves will be full stroke exercised during cold shutdowns and refueling outages.

5.2 Category B Valves

WR009, WR010, WR011, and WR012, RBCCW non-essential loop isolations, cannot be exercised during power operation since closure of these valves could result in damage to the equipment cooled by the following:

Primary Containment Vent Water Chiller

Reactor Water Clean-up System Non-regenerative Heat Exchangers

Reactor Water Cleanup Pump Seal and Bearing Coolers

Control Rod Drive Pump Seal and Bearing Coolers

Fuel Pool Heat Exchangers

Reactor Building Equipment Drain Tank

Drywell Pneumatic Compressor Intercoolers.

These valves will be full stroke exercised during cold shutdowns and refueling outages.

VII. ATTACHMENT III

Following is a listing of P&IDs utilized during the course of this review.

System	P&ID Number	Revision
Main Steam, Sheet 1	M-21	M
Feed Water	M-23	M
Cycled Condensate, Sheet 2	M-27	V
Service Water, Sheet 1	M-30	P
Service Water, Sheet 2	M-30	W
Drywell Pneumatic, Sheet 1	M-40	G
Drywell Pneumatic, Sheet 2	M-40	H
Reactor Recirculation, Sheet 1	M-47	N
Pressure Suppression	M-48	G
High Pressure Core Spray	M-49	N
Low Pressure Core Spray	M-50	R
Residual Heat Removal, Sheet 1	M-51	AB
Residual Heat Removal, Sheet 2	M-51	Y
Residual Heat Removal, Sheet 3	M-51	P
Residual Heat Removal, Sheet 4	M-51	T
Reactor Core Isolation Cooling, Sheet 1	M-52	R
Reactor Core Isolation Cooling, Sheet 2	M-52	S
Fuel Pool Cooling and Cleanup, Sheet 1	M-53	N
Fuel Pool Cooling and Cleanup, Sheet 2	M-53	M
Reactor Water Cleanup, Sheet 1	M-55	M
Control Rod Drive Hydraulic, Sheet 2	M-56	H
Control Rod Drive Hydraulic, Sheet 3	M-56	U
Standby Liquid Control	M-57	K
Reactor Building Closed Cooling Water, Sheet 1	M-58	U
Reactor Building Closed Cooling Water, Sheet 2	M-58	R
Reactor Building Closed Cooling Water, Sheet 4	M-58	L
Liquid Radwaste Equipment Drain Collection, Sheet 1	M-62	M
MSIV Leakage Control	M-73	H
Primary Containment Combustible Gas Control	M-74	N
Containment Monitoring, Sheet 1	M-81	J

Nuclear Boiler System, Sheet 1	M-83	P
Standby Gas Treatment	M-87	E
Primary Containment Ventilation Chilled Water Piping, Sheet 1	M-88	F
Reactor Building Ventilation, Sheet 1	M-92	B
Reactor Building Ventilation, Sheet 2	M-92	G
Primary Containment & Suppression Pool Purge	M-103	L

VIII. ATTACHMENT IV

1. We feel the following valves, which are not included in the IST program, need further review to determine if they perform a safety related function. Wm. H. Zimmer, Unit 1 has taken the stand that these valves are non-safety related and has not included them in their IST program.

Valve No.	P&ID and Location	Description
1WS012A 1WS012B 1WS013A 1WS013B	M-30-2(B-6) M-30-2(A-6) M-30-2(B-6) M-30-2(A-6)	Cross connect isolation valves between the Service Water and Residual Heat Removal Systems.
1WS014A 1WS014B	M-30-2(B-6) M-30-2(A-6)	Drain valve isolations on Service Water to Residual Heat Removal System cross connects.
1E12F089	M-51-4(B-2)	Check valve in Service Water to Residual Heat Removal System cross connect.
C11D001-138 C11D001-115	M-56-3(D-7) M-56-3(E-6)	Check valves from cooling water header and charging water header to the control rod drive hydraulic control unit.

2. In a letter from Anthony J. Cappucci (Mechanical Engineering Branch) to Robert J. Bosnak (Chief of Mechanical Engineering Branch) addressing the trip report for the review of the Zimmer, Unit 1 IST program, the spent fuel pool cooling system was discussed as follows:

   "The applicant stated that the spent fuel pool cooling system is not safety related. However, ASB requested CG&E to perform a seismic analysis on the piping to and from the fuel pool heat exchanger and provide the necessary supports to withstand the forces associated with the SSE. Also, this system is required to assure safe handling of fuel. Therefore, we should require that the pumps and valves associated with this system (seismically analyzed) be considered safety related for IST purposes and included in the program. We should obtain concurrence on this position with ASB."

   We contacted the Auxiliary Systems Branch (ASB) to determine which portions of the spent fuel pool cooling system were seismically qualified. On January 20, 1982, Norman Wagner of the ASB contacted us concerning our inquiry. He stated that the William H. Zimmer, Unit 1 Final Safety Analysis Report (FSAR) indicated that the spent fuel pool

cooling system is not seismically qualified. Table 3.2-1 on page 3.2-9 of the Zimmer FSAR shows not applicable for the seismic category for the spent fuel pool cooling system. Page 9.1-7 of the FSAR states that the spent fuel pool cooling system pumps are supplied by AC offsite power and do not have any automatic switching capabilities to an emergency power source. Therefore, we feel the spent fuel pool cooling system is non-safety related, and should not be included in the Wm. H. Zimmer IST program.

IX. ATTACHMENT V

The following items were discussed via telephone with the licensee, (Charles N. Alm) on November 30, 1981 and the licensee agreed to send revised pages to the NRC to modify their IST program dated October 22, 1981 to reflect these changes.

1. Relief request RD-2 will be modified to reflect the contents of Sections 7.1.1 and 7.2.1 of this report.

2. Relief request RI-1 will be modified to reflect the contents of Section 6.1.1 of this report.

3. Relief request RI-2 will be added to the Wm. H. Zimmer Unit 1, IST program to request relief from full-stroke exercising valve E51F030, RCIC check valve from the suppression pool to the RCIC pump. See Section 6.2 of this report for the evaluation of this relief request.

4. Footnotes 6 and 7 will be added to Table A-1 (List of Pumps for Inservice Testing) to reflect the contents of Section 1.2 of this report.