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SAFETY EVALUATION REPORT, INSERVICE TESTING PROGRAM, DAVIS-BESSE NUCLEAR POWER STATION - UNIT 1 (DOCKET NO. 50-346)

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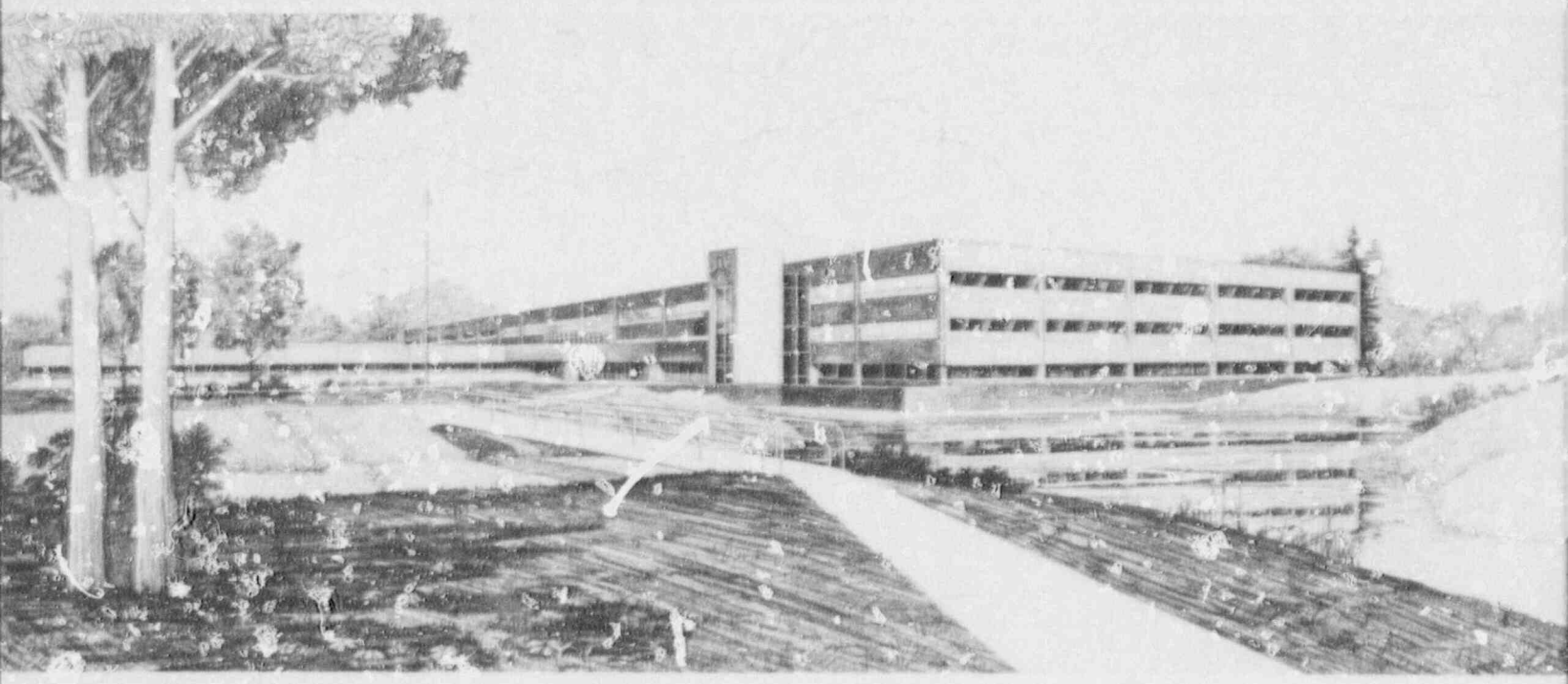
NRC Research and Technical Assistance Report

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



NRC Research and Technical Assistance Report

Prepared for the
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EG&G Idaho

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INTERIM REPORT

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1. INTRODUCTION

Contained herein is a safety evaluation of the pump and valve inservice testing (IST) program submitted by the Toledo Edison Company on June 27, 1977, for its Davis-Besse Unit 1 nuclear plant. The program applies to Davis-Besse Unit 1 for the period November, 1977, through November, 1987.

The working session with Toledo Edison and Davis-Besse Unit 1 representatives was conducted on November 19 and 20, 1980. The licensee resubmittal was issued on December 15, 1980 and was reviewed by EG&G Idaho, Inc., to verify compliance of proposed tests of safety-related Class 1, 2, and 3 pumps and valves with requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, through the Summer of 1978 Addenda. Toledo Edison 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 Sections II and III are the recommendations of EG&G Idaho, Inc.

Category A and A/C valves that are currently being leak tested per Technical Specifications (Appendix J) or are currently exempted from leak rate testing by Technical Specifications are contained in Attachment I.

Valves that should be reviewed by the NRC to determine if they should be categorized A 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 is contained in Attachment III.

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

II. PUMP TESTING PROGRAM

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

1. All Safety-Related Pumps

1.1 Relief Request

The licensee has requested specific relief from the monthly inservice test on all safety-related equipment cooling and emergency core cooling pumps in accordance with the requirements of Section XI, and proposed to test all pumps in compliance with Section XI once per quarter and to jog all pumps and measure flow monthly. The pumps are:

Auxiliary Feedwater

High Pressure Injection

Low Pressure Injection

Containment Spray

Component Cooling

Service Water.

1.1.1 Code Requirement. Refer to Appendix A.

1.1.2 Licensee's Basis for Requesting Relief. Monthly Section XI operability testing has been a Technical Specification requirement for these pumps since April 22, 1977. An analysis of the results of these tests and comparable data from other operating plants has shown no significant changes in performance. Based on this analysis, the continuation of Section XI monthly testing would not significantly increase plant safety. The Auxiliary Feedwater, High Pressure Injection, Low Pressure Injection, and Containment Spray pumps are standby pumps whose continuous operation is not required. The Service Water and Component Cooling Water pumps are continuously running, and any significant degradation will be detected during normal operation.

Monthly pump testing requires a total of at least 270 hours per year of pump operation, at least 714 man-hours per year for data acquisition, and at least 60 man-hours per year for data reduction and record keeping. At a conservative total cost of $20 per man-hour, this amounts to $15,480

per year. Based upon the average exposure rates in the areas of the Auxiliary Feedwater, High Pressure Injection, Low Pressure Injection, and Containment Spray pumps, the total man-rems exposure per year for pump testing is approximately 2.0 man-rems. At the present conservatively estimated cost of $10,000 per man-rem to plant personnel, this exposure costs an additional $20,000 per year. Total cost to our customers is approximately $5,480 per year for no significant increase in safety.

Alternate Testing: Pumps will be tested in compliance with ASME Section XI requirements once per quarter and will be jogged monthly and flow measured. This is in agreement with present changes that are being implemented in Subsection IWP of the Code.

The revision to change pump testing to a three month interval in IWP-3400 has been approved and will be included in future Addenda. See Minutes of the November 29, 1979, meeting of the Operating and Maintenance Working Group--Testing of Pumps and Valves, in San Jose, California, dated January 9, 1980.

1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel that relief should be granted for Auxiliary Feedwater, High Pressure Injection, Low Pressure Injection, Containment Spray, Component Cooling, and Service Water pumps from the testing requirements of Section XI. The licensee has demonstrated through previously conducted testing that the proposed alternate testing frequency is sufficient to determine any pump degradation (the intent of Section XI). We conclude that the licensee's proposal of running pumps monthly to measure Q to ensure no pump degradation, and of measuring all parameters quarterly, meets the intent of the Section XI testing requirements and should be sufficient to adequately monitor pump degradation.

1.2 Relief Request

The licensee has requested specific relief from measuring bearing temperature (T_b) on all safety-related equipment cooling and emergency core cooling pumps in accordance with the requirements of Section XI. The pumps are:

Auxiliary Feedwater

High Pressure Injection

Low Pressure Injection

Containment Spray

Component Cooling

Service Water.

1.2.1 Code Requirement. Refer to Appendix A.

1.2.2 Licenee's Basis for Requesting Relief. The referenced edition of the Code requires bearing temperature to be recorded annually. It has been demonstrated by experience that bearing temperature rise occurs only minutes prior to bearing failure. Therefore, the detection of possible bearing failure by a yearly temperature measurement is extremely unlikely. It requires at least an hour of pump operation to achieve stable bearing temperatures. The small probability of detecting bearing failure by temperature measurement does not justify the additional pump operating time required to obtain the measurements.

Alternate Testing: NONE. This is in agreement with present changes that are being implemented in Subsection IWP of the Code, the revision to delete yearly bearing temperature measurement. Deletion of bearing temperature measurement has been approved and will be included in future Addenda. See minutes of the November 28, 1979, meeting of the Operating and Maintenance Working Group--Testing of Pumps and Valves, in San Jose, California, dated January 9, 1980.

1.2.3 Evaluation. We agree with the licensee's basis and, therefore, feel that relief should be granted for Auxiliary Feedwater, High Pressure Injection, Low Pressure Injection, Containment Spray, Component Cooling, and Service Water pumps from the testing requirements of Section XI. The licensee has demonstrated that yearly bearing temperature (T_b) measurement is an unreliable method of detecting bearing failure and that deletion of the yearly T_b measurement will have no adverse effect on the Section XI pump testing program. We conclude that the licensee's proposal to run pumps monthly to measure Q to ensure no pump degradation, and to measure all parameters quarterly, except T_b yearly, meets the intent of the Section XI testing requirements and should be sufficient to adequately monitor pump degradation.

1.3 Relief Request

The licensee has requested specific relief from observation of proper lubrication level or pressure on all safety-related equipment cooling and emergency core cooling pumps in accordance with the requirements of Section XI. The pumps are:

Auxiliary Feedwater

High Pressure Injection

Low Pressure Injection

Containment Spray

Component Cooling

Service Water.

1.3.1 Code Requirement. Refer to Appendix A.

1.3.2 Licensee's Basis for Requesting Relief. The observation of lubrication level or pressure is a maintenance function not an operability test function. Pump lubrication requirements are determined by the pump manufacturer and plant operation.

Alternate Testing: Pump lubrication requirements are part of the plant maintenance procedures rather than Section XI operability test requirements. This is in agreement with present changes that are being implemented in Subsection IWP of the Code. The revision to eliminate observation of lubrication level or pressure from the Code has been approved and will be included in future Addenda. See minutes of the November 28, 1979, meeting of the Operating and Maintenance Working Group--Testing . Pumps and Valves, in San Jose, California, dated January 5, 1980.

1.3.3 Evaluation. We agree with the licensee's basis and, therefore, feel that relief should be granted for Auxiliary Feedwater, High Pressure Injection, Low Pressure Injection, Containment Spray, Component Cooling, and Service Water pumps from the testing requirements of Section XI. The licensee has demonstrated that proper lubrication levels or pressures are verified by plant maintenance procedures, and pump lubrication requirements are specified by pump manufacturer. We feel that duplication of recording test parameters will not assure any increase in the reliability of the above mentioned safety-related pumps. In addition, duplication of recording test parameters would not contribute meaningful information to the Section XI pump testing program. We conclude that the licensee's proposal to run pumps monthly to measure Q to ensure no pump degradation, and to measure all parameters quarterly, except lubrication level or pressure, meets the intent of the Section XI testing requirements and should be sufficient to adequately monitor pump degradation.

2. Safety-Related Installed Spare Pumps

2.1 Relief Request

The licensee has requested specific relief from operability testing of installed spare Component Cooling and Service Water pumps in accordance with the requirements of Section XI and proposed to test these pumps when they are connected to their respective system.

2.1.1 Code Requirement. Refer to Appendix A.

2.1.2 Licensee's Basis for Requesting Relief. Any one of the three Component Cooling or three Service Water pumps is an installed spare. One pump is normally running, the second is aligned as an automatic backup to the operating pump, and the third pump is electrically disconnected and manually valved out of the system. In the event of failure of the operating pump, the second automatically starts and the installed spare is electrically connected and manually valved in as the reserve pump.

Alternate Testing: The normally operating and reserve pumps will be tested. The installed spare need be tested only when it is connected to the system.

2.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel that relief should be granted for installed spare Component Cooling and Service Water pumps from the testing requirements of Section XI. The licensee has demonstrated that the installed spare pumps must be electrically connected and valved into the system before pump operation is possible. We conclude that the licensee's proposal to test the installed spare pumps after they have been placed in service meets the requirements of Section XI, Subsection IWP.

3. VALVE TESTING PROGRAM EVALUATION

The IST program submitted by Toledo Edison Company 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. Also, included in Section 1 is the NRC position and valve listings for the leak testing of valves that perform a pressure isolation function and a procedure for the licenee's use to incorporate these valves into the IST program. Each Toledo Edison Company request for relief from testing valves, the Code requirement for testing, Toledo Edison Company's basis for requesting relief, and the EG&G evaluation of that request is summarized below and grouped according to each specific system.

1. General Considerations

1.1 Testing of Valves which Perform a Pressure Isolation Function

There are several safety systems connected to the reactor coolant pressure boundary that have design pressure below the rated Reactor Coolant System (RCS) pressure. Also included are those systems which are rated at full reactor pressure on the discharge side of pumps that have pump suction below RCS pressure. In order to protect these systems from RCS pressure, two or more isolation valves are placed in series to form the interface between the high pressure RCS and the low pressure systems. The leak tight integrity of these valves must be ensured by periodic leak testing to prevent exceeding the design pressures of the low pressure systems causing a LOCA.

It is NRC's position that these valves be classified as Category A or A/C, as described in Section XI, Subsection IWV, of ASME Boiler and Pressure Vessel Code and leak tested in accordance with IWV-3420 of the above mentioned Code at least once per refueling outage. The allowable leakage limit for each valve should not exceed 1.0 gallons per minute (gpm).[a] The NRC and EG&G Idaho, Inc., have discussed this matter with the licensee and have identified the valves listed below as valves that perform a pressure boundary isolation function.

CF30 Low Pressure Injection Check

CF31 Low Pressure Injection Check

CF76 Low Pressure Injection Check

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a. See NUREG-0677, "The Probability of Intersystem LOCA: Impact Due to Leak Testing and Operational Changes," and the proposed Appendix A to SRP Section 3.9.6, "Leak Testing of Pressure Isolation Valves."

CF77	Low Pressure Injection Check
CF28	Core Flood Tank Isolation Check
CF29	Core Flood Tank Isolation Check
HP48	High Pressure Injection Check
HP49	High Pressure Injection Check
HP50	High Pressure Injection Check
HP51	High Pressure Injection Check
HP56	High Pressure Injection Check
HP57	High Pressure Injection Check
HP58	High Pressure Injection Check
HP59	High Pressure Injection Check

The NRC informed the licensee that constant leak monitoring is an acceptable method of ensuring valve integrity in lieu of Section XI, Subsection IWV-3420 leak testing. The licensee stated that valves CF28, CF29, HP48, HP49, HP50, HP51, HP56, HP57, HP58, and HP59 do have constant leak monitoring instrumentation installed and that the integrity of valves CF30, CF31, DH76, and DH77 is verified per ST5050.03 at a cold shutdown frequency. In addition, the licensee has included in the ISI program the 2 1/2 in. high pressure injection lines from the discharge check valves of the High Pressure Injection Pumps to the Class 1/2 boundary as an expansion of the overall inspection and test program. On the basis of this information, the NRC stated that categorizing each of these valves C instead of A/C is acceptable.

1.2 ASME Code Section XI Requirements

Subsection IWV-3411 of the Section XI Code requires that Code Category A and B valves be exercised once every three months, with the exceptions as defined in IWV-3412(a). IWV-3521 requires that Code Category C valves be exercised once every three months, with the exceptions as defined in IWV-3522. IWV-3700 contains test requirements for active and passive valves. The limiting value of full stroke time for each power operated valve shall be identified by the owner and tested in accordance with IWV-3413(a), (b), and (c). In the above 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.

1.3 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 stroke exercised. If only limited operation is possible (and it has been demonstrated by the licensee and agreed to by the NRC), the check valves shall be partial stroke exercised. 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 partial 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 though the valve. The licensee agreed to conduct flow tests to satisfy the above position.

1.4 Stroke Testing of Motor Operated Valves

The licensee has requested relief from the partial stroke exercising requirement of Section XI for all power operated valves. The licensee has stated that none of the Category A or B power operated valves identified can be partial stroke exercised because of the design logic of the operating circuits. These circuits are such that, when an open or close signal is recieved, the valve must complete a full stroke before the relay is released to allow the valve to stroke in the other direction. We find that the above relief request from partial stroke exercising is warranted and should be granted because the required function of the valves involves only full open or full closed positions.

1.5 Licensee Request for Relief to Test Valves at Cold Shutdown

The Code permits valves to be tested at cold shutdown, and these valves are specifically identified by the licensee and are full stroke exercised during cold shutdowns; therefore, the licensee is meeting the requirements 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 is not practical to exercise these valves during power operation and that we agree with the licensee's basis for requesting relief.

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.

1.6 Changes to the Technical Specifications

In a November 1976 letter to the licensee, the NRC provided an attachment entitled, "NRC Guidelines for Excluding Exercising (Cycling) Tests of Certain Valves During Plant Operation." The attachment stated that, when one train of a redundant system such as 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 a plant's Technical Specifications (T.S.), the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs, all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For such plants, this situation could be contrary to the NRC guideline as stated in the document mentioned above. It should be noted that 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 effected which demonstrates that the valve's failure would cause a loss of system function or, if the licensee determines that the T.S. should not be changed because the guidelines are not applicable or cannot be followed, the licensee will submit the reasons that led to their determination for each potentially effected section of the T.S.

1.7 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.

1.8 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 plant is ready to return to power.

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

2. 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.

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

1.9 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 through -3425 have been superceded 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 Paragraphs IWV-3420 through -3425 for CIVs presents no safety problem since the intent of IWV-3420 through -3425 is met by Appendix J requirements.

The licensee shall comply with Paragraphs IWV-3426 and -3427 until relief is requested from these paragraphs. It should be noted that these paragraphs are only applicable where a Type C, Appendix J leak test is performed.

Based on the considerations discussed above, the NRC concludes that the alternate testing proposed above will give the reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

1.10 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 our 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.

1.11 Pressurizer Power Operated Relief Valves

The NRC has adopted the position that the pressurizer power operated relief valves should be included in the IST program as Category B valves and tested to the requirements of Section XI. However, since the PORVs have shown a high probability of sticking open and are not needed for overpressure protection during power operation, the NRC has concluded that routine exercising during power opration is "not practical" and, therefore, not required by IWV-3412(a).

The PORVs' function during reactor startup and shutdown is to protect the reactor vessel and coolant system from low temperature-overpressurization conditions and should be exercised prior to initiation of system conditions for which vessel protection is needed.

The following test schedule is recommended:

1. Full stroke exercising should be performed at each cold shutdown or, as a minimum, once each refueling cycle.

2. Stroke timing should be performed at each cold shutdown or, as a minimum, once each refueling cycle.

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

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

The Davis-Besse Unit 1 design utilizes one PORV and an associated block valve. The licensee has included these valves in the IST program along with a request for relief from the Section XI, Category B, testing requirements for the PORV that describes the testing and position monitoring program (refer to Section 7.1.1).

1.12 Manual Stop/Check Valves

The licensee has defined manual stop/check valves Category C, passive, in the IST program. The purpose of this categorization is to ensure proper administrative and procedural control of the valve operator position. The active portion of the valve, the disk, is being exercised as per the requirements of Section XI unless identified otherwise in this report.

2. All Systems

2.1 All Safety-Related Power Operated Valves

2.1.1 Relief Request. The licensee has requested specific relief from the power operated valve timing requirements of all safety-related power operated valves in accordance with the requirements of Section XI and proposed to measure the stroke time of all power operated valves to the nearest second.

2.1.1.1 Code Requirement. Refer to Appendix A.

2.1.1.2 Licensee's Basis for Requesting Relief. For valves with stroke times less than 10 seconds, this would require measuring stroke times to within a fraction of a second. Valve timing is performed using a stop watch either by directly observing valve movement or by observing

remote position indicators. Neither method can be relied upon to yield results with accuracy of less than a second.

Alternate Testing: The stroke time of all power operated valves shall be measured to the nearest second.

2.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for all power operated safety-related valves (with stroke times less than 10 seconds) from the timing requirements of Section XI. The licensee had demonstrated that, using the presently available methods of measuring stroke times, accuracy is limited and meaningful data on valve stroke time degradation cannot be obtained. We conclude that measuring stroke time to the nearest second meets the intent of Section XI and should provide meaningful data to use in determining any valve degradation.

2.1.2 Relief Request. The licensee has requested specific relief from the power operated valve timing requirements of all safety-related power operated valves in accordance with Section XI.

2.1.2.1 Code Requirement. Refer to Appendix A.

2.1.2.2 Licensee's Basis for Requesting Relief. Operating experience has indicated that individual valve timing is influenced by many factors such as changes in temperature, humidity, fluxuation in power source, limit switch adjustment, etc. Because of these outside factors, timing data can exhibit scatter which exceeds the Code criteria, but which is still less than the maximum full stroke time. Lacking in the Code requirements is any provision for verifying test results prior to placing the valve on an accelerated test frequency.

The present Code does not require any action for valves whose stroke time suddenly decreases a significant amount. Any marked decrease outside the normal band of stroke times could indicate a major mechanical problem such as the power operator being disconnected from the valve. Any significant decrease in stroke time should be investigated to determine if the valve and power actuator are capable of performing their function.

Alternate Testing: Maximum full stroke times shall be established for each valve based upon required valve response time to assure adequate system response for safety-related functions. Valve test times will be acceptable if less than the maximum allowed. If test time exceeds the maximum allowed, the valve will be immediately retested and corrective action taken as appropriate. Any significant decrease in valve test time will immediately be investigated and appropriate action taken.

2.1.2.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for all safety-related power operated valves from the stroke timing requirements of Section XI. The licensee has demonstrated that the initiation of immediate retesting and corrective action upon detection of abnormal valve stroke times meets the requirements of Section XI. We conclude that the proposed alternate stroke timing and corrective action requirements for these valves will provide the required

meaningful data to determine and correct any valve degradation (the intent of Section XI).

3. Steam Generator Secondary System

3.1 Category C Valves

3.1.1 Relief Request. The licensee has requested specific relief from exercising Category C valves AF39, 43, 72, 73, 74, and 75, auxiliary feedwater checks, in accordance with the requirements of Section XI and proposed to partial stroke exercise these valves during refueling outages.

3.1.1.1 Code Requirement. Refer to Appendix A.

3.1.1.2 Licensee's Basis for Requesting Relief. Cycling these valves would require injection of auxiliary feedwater into the steam generator which would thermal shock the auxiliary feedwater nozzles. These valves cannot be partial stroke exercised during normal operation or full stroke exercised at any time without injecting auxiliary feedwater into the steam generator and thermal shocking the auxiliary feedwater nozzles. These valves will be partial stroke forward flow cycled during refueling outages when the steam generator is cold. These valves cannot be full stroke exercised during refueling outages because the auxiliary boiler is used to power the auxiliary feed pump turbine. The auxiliary boiler does not generate enough steam to operate the turbine at design flow.

3.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel temporary relief should be granted for Category C valves AF39, 43, 72, 73, 74, and 75 from the full stroke exercising requirements of Section XI. The licensee has demonstrated that the valves cannot be exercised during power operation without causing thermal shock to the auxiliary feedwater nozzles and that the steam generators may not be cool enough to prevent thermal shock during cold shutdown. The valves cannot be full stroke exercised during refueling outages because the auxiliary boiler must be used to supply steam to the auxiliary feed pumps and does not generate enough steam to achieve design feedwater flow. We conclude that, with the present piping configurations, only partial stroke exercising of these valves is possible. However, we recommend that the licensee further investigate a method to full stroke exercise these valves.

4. Station and Instrument Air

4.1 Category A/C Valves

4.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valve SA502, station air containment isolation check, in accordance with the requirements of Section XI.

4.1.1.1 Code Requirement. Refer to Appendix A.

4.1.1.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. This valve will

be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

4.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valve SA502 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (its safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

4.1.2 Relief Request. The licensee has requested specific relief from exercising Category A/C valve IA501, instrument air containment isolation check, in accordance with the requirements of Section XI.

4.1.2.1 Code Requirement. Refer to Appendix A.

4.1.2.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. This valve will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

4.1.2.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valve IA501 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (its safety-related position) is leak rate testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

5. Nitrogen Supply

5.1 Category A/C Valves

5.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valve NN58, nitrogen supply containment isolation check, in accordance with the requirements of Section XI.

5.1.1.1 Code Requirement. Refer to Appendix A.

5.1.1.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. This valve will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

5.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valve NN58 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure

(its safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

6. Containment and Penetration Rooms

6.1 Category A/C Valves

6.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valves CV209 and 210, hydrogen dilution air containment checks, in accordance with the requirements of Section XI and proposed to exercise them open during cold shutdown and verify closure during refueling.

6.1.1.1 Code Requirement. Refer to Appendix A.

6.1.1.2 Licensee's Basis for Requesting Relief. Cycling can only be performed by injecting air from the hydrogen dilution blowers into the containment. This air must be purged from the containment to the environment. Purge time is limited to 90 hours per year during normal operation. Testing could cause excessive purging with resulting increase in releases to the environment. These valves will by cycled at cold shutdown. No partial stroke exercising is possible during normal operation without injecting air into the containment. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. These valves will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

6.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valves CV209 and 210 from the exercising requirements of Section XI. The licensee has demonstrated that these valves have two safety-related positions depending upon plant conditions. These valves are required to open to admit post-accident hydrogen dilution air to the containment and to close to provide containment isolation. They cannot be exercised open during power operation without injecting air into the containment which must be purged to the environment. Purge time during power operation is limited to $\leq$90 hours per year by NRC directive. Due to plant design, the only available method to verify valve closure is during leak testing. We conclude that the proposed alternate testing frequency of exercising valves CV209 and 210 open during cold shutdown and verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

6.1.2 Relief Request. The licensee has requested specific relief from exercising Category A/C valves CV124, and 125, containment atmosphere sample checks, in accordance with the requirements of Section XI.

6.1.2.1 Code Requirement. Refer to Appendix A.

6.1.2.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. These valves will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

6.1.2.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valves CV124 and 125 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (their safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

7. Reactor Coolant

7.1 Category B Valves

7.1.1 Relief Request. The licensee has requested specific relief from stroke timing Category B valve RC2A, pressurizer pressure control (PORV), in accordance with the requirements of Section XI.

7.1.1.1 Code Requirement. Refer to Appendix A and Section 1.11.

7.1.1.2 Licensee's Basis for Requesting Relief. Full stroke exercising cannot be visually verified on this valve since the valve mechanism is all internal. A test can be performed by closing the block valve and seeing if RC2A solenoid energizes and de-energizes properly. Stroke timing is impractical as the valve mechanism is all internal and the valve is pilot actuated. You can measure the position of the pilot but not of the valve itself. This is not a motor operated valve. There is no fail-safe position of this valve. RC2A is tested in PT 5164.02, Pressurizer Power Relief Valve Periodic Test, in conjunction with ST 5030.04, RCS Pressure to the RPS Refueling Period Calibration Procedure, at least once per 18 months with the unit in cold shutdown (or refueling) mode. This test verifies that RC2A will open when its associated solenoid is energized and will close when the solenoid is de-energized. This test is normally run with the RCS pressure at 2155 psig but can also be performed at <2155 psig but >500 psig in the RCS. This test also verifies that the solenoid associated with RC2A will be energized at a signal equivalent to an RCS pressure of 2400 ± 10 psig and de-energized by a signal equivalent to an RCS pressure of 2350 ± 10 psig. This phase is run by simulating output signals from the RPS to PSHL-RC2-5 in the NNI cabinets and verifying proper operation of the solenoid at RC2A. ST 5030.04 will verify that the instrument strings for the RPS pressure transmitters selectable for use in the NNI are calibrated from the pressure transmitters to the output of the RPS cabinets. An acoustic monitor is used to verify valve opening and closing. This valve may be effectively partial stroke exercised during normal operation in response to pressurizer conditions. This valve will be full stroke exercised at refueling during performance of plant procedure PT 5164.02, which also verifies pressure setpoint. No valve timing is possible.

7.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category B valve RC2A from the stroke timing requirements of Section XI. The licensee has demonstrated that, due to design, this valve cannot be accurately timed and that stroke timing will not provide meaningful data for valve degradation. The licensee's test and position monitoring program detailed above (Item 7.1.1.2) was discussed with NRC representatives at the working meeting and found to be acceptable in that it meets the NRC recommendations outlined in Valve Testing Section 1.11. We conclude that the proposed alternate test and monitoring program is consistent with NRC recommendations and should demonstrate proper valve operability.

8. Makeup and Purification

8.1 Category A Valves

8.1.1 Relief Request. The licensee has requested specific relief from exercising Category A valves MU38, 59A, 59B, 59C, 59D, 66A, 66B, 66C, and 66D, reactor coolant pump seal water containment isolations, in accordance with the requirements of Section XI and proposed to exercise these valves during refueling outages.

8.1.1.1 Code Requirement. Refer to Appendix A.

8.1.1.2 Licensee's Basis for Requesting Relief. Cycling these valves during normal operation would stop reactor coolant pump seal cooling water flow. This would damage reactor coolant pump seals and is not permitted by plant operating procedure. The reactor coolant pumps are required to be running under all normal conditions except refueling. Valve design precludes partial stroke exercising during normal operation. These valves will by cycled at refueling outages.

8.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A valves MU38, 59A, 59B, 59C, 59D, 66A, 66B, 66C, and 66D from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised while reactor coolant pumps are in operation without possible pump seal damage. The reactor coolant pumps are required to be running at all times during normal plant conditions by plant procedures, and are secured during refueling outages. Seal water can then be secured. We conclude that the proposed alternate test frequency of exercising these valves during refueling outages when the reactor coolant pumps are secured should demonstrate proper valve operability.

8.2 Category A/C Valves

8.2.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valves MU242, 243, 244, and 245, reactor coolant pump seal water checks, in accordance with the requirements of Section XI.

8.2.1.1 Code Requirement. Refer to Appendix A.

8.2.1.2 Licensee's Basis for Requesting Relief. Reverse flow cycling during normal operation or cold shutdown would require stopping reactor coolant pump seal cooling water flow. This would damage reactor coolant pump seals and is not permitted by plant procedure. The reactor coolant pumps are required to be running under all normal conditions except refueling. System operation precludes partial stroke testing during normal operation. Reverse flow stroking will be done at refueling outages during the performance of an Appendix J, Type C, test.

8.2.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valves MU242, 243, 244, and 245 from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised while reactor coolant pumps are in operation without possible pump seal damage. In addition, the only method available to verify valve closure (their safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

9. Decay Heat and Emergency Core Cooling

9.1 Category B Valves

9.1.1 Relief Request. The licensee has requested specific relief from exercising Category B valves DH9A and 9B, containment emergency sump isolations, in accordance with the requirements of Section XI and proposed to exercise these valves during refueling outages.

9.1.1.1 Code Requirement. Refer to Appendix A.

9.1.1.2 Licensee's Basis for Requesting Relief. Cycling these valves would introduce borated water from the borated water storage tank directly into the containment emergency sump. These valves are interlocked with DH7A and 7B and can only be tested when the borated water storage tank can be isolated. These valves cannot be partial stroke tested during normal operation without injecting borated water into the containment emergency sump. These valves will be cycled at refueling outages when the borated water storage tank can be isolated.

9.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category B valves DH9A and 9B from the exercising requirements of Section XI. The licensee has demonstrated that these normally closed valves cannot be exercised without flooding the containment emergency sump from the borated water storage tank. Valves DH9A and 9B are interlocked with normally open valves DH7A and 7B, borated water storage tank outlet valves. The borated water storage tank is required to be available as a water supply during all normal plant conditions except refueling; therefore, DH7A and 7B cannot be closed to satisfy the interlocks to allow exercising DH9A and 9B. We conclude that the proposed alternate testing frequency of exercising valves DH9A and 9B during refueling outages when the borated water storage tank can be isolated should demonstrate proper valve operability.

9.2 Category C Valves

9.2.1 Relief Request. The licensee has requested specific relief from exercising Category C valves CF28 and 29, core flood tank outlet checks, in accordance with the requirements of Section XI.

9.2.1.1 Code Requirement. Refer to Appendix A.

9.2.1.2 Licensee's Basis for Requesting Relief. Forward flow cycling cannot be performed during normal operation or cold shutdown when the RCS is filled and pressurized to pressure greater than that of the core flood tank. Full stroke is precluded by system design. These valves will be partial stroke exercised at refueling outages when the contents of the core flood tank can be partially dumped into the RCS while monitoring core flood tank level.

9.2.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel temporary relief should be granted for Category C valves CF28 and 29 from the exercising requirements of Section XI. The licensee has demonstrated that the only available full flow path is into the reactor coolant system and is not possible during power operation because the core flood tank pressure cannot overcome RCS pressure.

These valves cannot be full stroke exercised during cold shutdown without the possibility of creating a low temperature-overpressurization condition in the RCS. We conclude that, with the present piping configuration, only partial stroke exercising of these valves is possible. However, we recommend that the licensee further investigate a method to full stroke exercise these valves.

9.2.2 Relief Request. The licensee has requested specific relief from exercising Category C valves HP48, 49, 50, 51, 56, 57, 58, and 59, high pressure injection checks, in accordance with the requirements of Section XI.

9.2.2.1 Code Requirement. Refer to Appendix A.

9.2.2.2 Licensee's Basis for Requesting Relief. These valves can only be cycled by high pressure injection flow. High pressure injection during normal operation or cold shutdown could introduce cold water into the significantly hotter reactor coolant system. This would thermal shock the high pressure injection nozzles. Additionally, high pressure injection during cold shutdown could subject the reactor coolant system to pressures higher than allowed in the cold shutdown mode. System operation precludes partial stroke exercising these valves during normal operation. These valves will be forward flow cycled at refueling outages when the reactor vessel head is removed to provide an adequate expansion volume.

9.2.2.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category C valves HP48, 49, 50, 51, 56, 57, 58, and 59 from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised during power operation or cold shutdown without causing thermal shock to the high

pressure injecton nozzles. These valves cannot be full stroke exercised during cold shutdown without the possibility of creating a low temperature-overpressurization condition in the RCS. We conclude that full stroke exercising these valves during refueling outages when an expansion volume is available should demonstrate proper valve operability.

10. Emergency Core Cooling, Containment Spray, and Core Flood

10.1 Category A/C Valves

10.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valves CF15 and 16, core flood tank nitrogen supply containment isolation checks, in accordance with the requirements of Section XI.

10.1.1.1 Code Requirement. Refer to Appendix A.

10.1.1.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling outages. These valves will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

10.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valves CF15 and 16 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (their safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

11. Component Cooling Water

11.1 Category A Valves

11.1.1 Relief Request. The licensee has requested specific relief from exercising Category A valves CC1411B and 1407B, component cooling water containment isolations, in accordance with the requirements of Section XI and proposed to exercise these valves during refueling outages.

11.1.1.1 Code Requirement. Refer to Appendix A.

11.1.1.2 Licensee's Basis for Requesting Relief. Cycling these valves during normal operation or cold shutdown requires shutting off cooling water to the reactor coolant pumps which would cause extensive damage to the pumps. Cooling water to the reactor coolant pumps is required except at refueling. Valve design precludes partial stroke exercising these valves during normal plant operation. These valves will be full stroke exercised at refueling outages.

11.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A valves CC1411B and

1407B from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised while the reactor coolant pumps are running without causing pump damage. The pumps are secured during refueling outages and cooling water is not required. We conclude that the proposed alternate testing frequency of exercising these valves during refueling outages when the reactor coolant pumps are secured should demonstrate proper valve operability.

11.2 Category B Valves

11.2.1 Relief Request. The licensee has requested specific relief from exercising Category B valves CC1411A and 1407A, component cooling water supply and return, in accordance with the requirements of Section XI and proposed to exercise these valves during refueling outages.

11.2.1.1 Code Requirement. Refer to Appendix A.

11.2.1.2 Licensee's Basis for Requesting Relief. Cycling these valves during normal operation or cold shutdown requires shutting off cooling water to the reactor coolant pumps which would cause extensive damage to the pumps. Cooling water to the reactor coolant pumps is required except at refueling. Valve design precludes partial stroke exercising during normal operation. These valves will be full stroke exercised at refueling outages.

11.2.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category B valves CC1411A and 1407A from the exercising requirements of Section XI. The licensee has demonstrated that these valves cannot be exercised while the reactor coolant pumps are running without causing pump damage. The pumps are secured during refueling and cooling water is not required. We conclude that the proposed alternate testing frequency of exercising these valves during refueling outages when the reactor coolant pumps are secured should demonstrate proper valve operability.

12. Reactor Coolant System Details

12.1 Category A/C Valves

12.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valve RC113, pressurizer quench tank recirculation line containment isolation, in accordance with the requirements of Section XI.

12.1.1.1 Code Requirement. Refer to Appendix A.

12.1.1.2 Licensee's Basis for Requesting Relief. Verification of reverse flow closing can only practicably be accomplished by leak testing. This testing can only be performed at refueling. This valve will be reverse flow closure tested at refueling outages during the performance of an Appendix J, Type C, test.

12.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category A/C valve RC113 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (its safety-related position) is leak testing. We conclude that the proposed alternate testing frequency of verifying valve closure during the performance of leak rate testing at refueling outages should demonstrate proper valve operability.

13. Service Water

13.1 Category C Valves

13.1.1 Relief Request. The licensee has requested specific relief from exercising Category C valve SW57, service water isolation check, in accordance with the requirements of Section XI.

13.1.1.1 Code Requirement. Refer to Appendix A.

13.1.1.2 Licensee's Basis for Requesting Relief. Reverse flow cycling requires stopping cooling water flow through the turbine plant cooling water heat exchangers which could result in extensive equipment damage. System operation precludes partial stroke exercising this valve during normal plant operation. This valve will be reverse flow cycled at refueling outages when cooling water is not required.

13.1.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted for Category C valve SW57 from the exercising requirements of Section XI. The licensee has demonstrated that, due to plant design, the only method available to verify valve closure (its safety-related position) is by securing service water flow through the "cooling water heat exchanger." These coolers serve the turbine building equipment. Service water cannot be secured during power operation without possible equipment damage. Turbine building equipment cooling requirements may be such that service water flow cannot be secured during cold shutdown. We conclude that the proposed alternate testing frequency of verifying valve closure during refueling outages when service water flow can be secured should demonstrate proper valve operability.

IV. APPENDIX A

1. Code Requirements--Valves

Subsection IWV-3411 of the Section XI ASME Code requires that Code Category A and B valves be exercised once every three months, with exceptions as defined in IWV-3412(a). IWV-3521 requires that Code Category C valves be exercised once every three months, with exceptions as defined in IWV-3522. IWV-3700 contains test requirements for active and passive valves. The limiting value of full stroke time for each power operated valve shall be identified by the owner and tested in accordance with IWV-3413(a), (b), and (c). 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.

2. Code Requirements--Pumps

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

V. ATTACHMENT I

1. Decay Heat and Emergency Core Cooling

1.1 Valves DH11 and DH12

The categorization of valves DH11 and 12 was discussed with the licensee at the working meeting and left as an unresolved item for further NRC review. The licensee had included these two valves in the IST program as Category B, passive valves, and expressed a desire that they remain in the program as such. The valves are in series and in the Decay Heat Removal System suction from the RCS inside containment. Each valve is interlocked closed when RCS pressure is greater than 350 lb and cannot be opened until reactor pressure is reduced to less than 350 lb. Then, the Decay Heat Removal System is placed in operation and must remain operating until the plant is ready to return to power. The licensee stated that the valves cannot be leak tested during cold shutdown because they must remain open for Decay Heat Removal System operation and that personnel hazards exist during power operation (i.e., accessibility, high radiation, and possible high pressure in the pipe).

2. Review Findings

During the course of our review of the Davis-Besse Unit 1 IST program, we found no other valves that need further review by the NRC for compliance with the requirements of 10 CFR 50, Appendix J.

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 would place the plant in an unsafe condition. We feel that these valves should not be exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

1. Main Steam

1.1 Category C Valves

Category C valves MS100 and 101, main steam isolations, cannot be exercised during power operation. Cycling these valves during normal operation results in loss of main steam to the turbine which causes a reactor trip. Partial stroke exercising these valves during normal operation is not possible because partial stroke exercising can only be performed locally at the valve. If these valves were to inavertently fail closed during testing, the main steam reliefs would lift. The local test station is located in the area which fills with steam from the main steam reliefs. Entry into this area is strictly controlled during operation. No remote partial stroke exercising capability is available. These valves will be full stroke exercised during cold shutdown.

2. Steam Generator Secondary System

2.1 Category B Valves

Category B valves FW601 and 612, main feedwater isolations, cannot be exercised during power operation. Cycling these valves during normal operation would cause loss of main feedwater to the steam generator which would cause reactor trip. Valve design precludes partial stroke exercising during normal operation. These valves will be full stroke exercised during cold shutdown.

3. Containment and Penetration Rooms

3.1 Category C Valves

Category C valves CV117, 191, 186, 187, hydrogen dilution blowers suction and discharge checks, cannot be exercised during power operation. Cycling these valves can only be performed by injecting air from the hydrogen dilution blowers into the containment. This air must be purged from the containment to the environment. Purge time is limited to 90 hours per year during normal operation. Testing could cause excessive purging with

resulting increase in releases to the environment. No partial stroke exercising is possible during normal operation without injecting air into the containment. These valves will be full stroke exercised at cold shutdown.

Category C valves CV5080 through 5090, containment vacuum breakers, cannot be exercised during power operation. Forward flow cycling can only be performed by entering the annular area between the containment and shield building and verifying freedom of valve by hand. Entry to this area during power operation is strictly controlled and limited to entry only when absolutely necessary. (As per Special Order No. 84-4, Revision 4, dated January 8, 1979). Valve design precludes partial stroke exercising during normal operation. These valves will be verified for freedom of valve movement at cold shutdown.

4. Reactor Coolant

4.1 Category B Valves

Category B valve RC10, pressurizer spray control, cannot be exercised during power operation. Failure of this valve in the closed position would result in loss of RCS pressure control which is required during normal operation. Valve design precludes partial stroke exercising during normal operation. This valve will be full stroke exercised during cold shutdown.

5. Makeup and Purification

5.1 Category A Valves

Category A valve MU33, normal makeup water to the reactor coolant system, cannot be exercised during power operation. Failure of this valve in the closed position during testing would result in total loss of normal makeup to the RCS. Makeup is required during normal operation. Valve design precludes partial stroke exercising during normal operation. This valve will be cycled at cold shutdown when makeup water is not required.

Category A valve MU2A, letdown isolation, cannot be exercised during power operation. If this valve were to fail in the closed position during testing, loss of normal letdown would result. Letdown is required to control reactor coolant inventory as the required reactor coolant pump seal injection continuously adds water to the RCS. Loss of pressurizer level control could result in a reactor trip. This valve will be exercised and stroke time measured during cold shutdown.

6. Decay Heat and Emergency Core Cooling

6.1 Category B Valves

Category B valves HP2A, 2B, 2C, and 2D, high pressure injection isolations, cannot be exercised while the RCS is pressurized. No pressure monitoring devices are installed on the upstream side of these valves. The upstream piping is isolated from RCS pressure by two check valves. Cycling these valves during normal operaton may allow high pressure water to be released into the high pressure injection system. These valves will be stroked and timed at cold shutdown when the RCS is depressurized.

6.2 Category C Valves

Category C valves CF30 and 31, DH76 and 77, low pressure injection checks, cannot be exercised during power operation. Forward flow cycling can only be performed by injecting water from the decay heat system into the RCS. This can only be done at cold shutdown when RCS pressure is low enough to permit injection. System operation precludes partial stroke exercising these valves during normal operation when RCS pressure is greater than the decay heat system design pressure. These valves will be forward flow cycled at cold shutdown.

7. Component Cooling Water

7.1 Category A Valves

Category A valve CC1567B, control rod drive cooling water containment isolation, cannot be exercised during power operation. Cycling this valve would require shutting off cooling water to the control rod drives which can only be done at cold shutdown. Valve design precludes partial stroke exercising during normal operation. This valve will be full stroke exercised at cold shutdown.

7.2 Category B Valves

Category B valve CC1460, makeup pump cooling water supply, cannot be exercised during power operation. Cycling this valve during normal operation or cold shutdown requires shutting off cooling water to the makeup pump coolers which could cause damage to the pumps. Cooling water to the pumps can only be shut off during cold shutdown. Valve design precludes partial stroke exercising during normal operation. This valve will be full stroke exercised at cold shutdown.

Category B valve CC1567A, control rod drive cooling water supply, cannot be exercised during power operation. Cycling this valve would require shutting off cooling water to the control rod drives which can only be done at cold shutdown. Valve design precludes partial stroke exercising during normal operation. This valve will be full stroke exercised at cold shutdown.

VII. ATTACHMENT III

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

System	P&ID	Revision
Main Steam	M-003	29
Feedwater System	M-006B	32
Steam Generator Secondary System	M-007	29
Makeup Water Treatment System	M-010B	22
Station and Instrument Air	M-015	20
Fuel Oil and Diesel Generators	M-017	26
Nitrogen Supply	M-019	23
Containment and Penetration Rooms	M-029A M-029B	24 24
Reactor Coolant	M-030	27
Makeup and Purification	M-031	31
Decay Heat and Emergency Core Cooling	M-033	34
Emergency Core Cooling, Containment Spray, and Core Flood	M-034	20
Spent Fuel Cooling	M-035	22
Component Cooling Water	M-036	28
Reactor Coolant System Details	M-040A	26
Service Water	M-041	26

VIII. ATTACHMENT IV

The following valves are never full stroke exercised or have a testing frequency greater than each refueling outage.

1. CF28 and 29, core flood tank discharge checks

2. AF39, 43, 72, 73, 74, and 75, auxiliary feedwater checks to the steam generators.