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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM RELIEF REQUESTS

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

The licensee's inservice testing (IST) program was reviewed by the staff and a Safety Evaluation (SE) was issued to the licensee on July 25, 1990. The SE identified a number of items of the licensee's IST program which can be found in Enclosure 2, Appendix C, of the July 25, 1990, letter. The licensee was requested to address these items within the time periods specified in the SE. The licensee responded to all the items in two separate submittals dated July 17, 1991, and October 4, 1991. This SE addresses all the item responses from the licensee and any new or revised relief requests issued by the licensee as a result of the staff's July 25, 1990, SE.

2.0 EVALUATION

2.1 Technical Evaluation Report Items

Item 1:

Relief Request PR-1 requested relief from measurement of vibrational displacement per IWP-4500 and proposed to measure vibration velocity and evaluate the data per OM-6. Relief was granted provided the licensee utilizes all the criteria regarding vibrational testing contained in ASME/ANSI OMa-1988, Part 6. The licensee submitted a revised valve relief request PR-1 in their July 17, 1991, submittal. The licensee's revised request includes measurement criteria for reciprocating pumps, defined by ASME/ANSI OMa-1988, Part 6, Paragraph 4.5, and clarifies the point that Dresden has no vertical line shaft pumps, therefore, acceptance criteria for vertical line shaft pumps are not included in their IST program. Since the licensee now incorporates the conditions from ASME/ANSI OMa-1988, Part 6, specified in the staff's July 25, 1990, SE specifically addressing reciprocating and vertical line shaft pumps, the staff finds that the proposed measurement method will provide an acceptable level of quality and safety, and that Relief Request PR-1 may be granted pursuant to 10 CFR 50.55a(a)(3)(i).

Item 2:

Relief Request PR-7 requested relief to assign limiting values of vibration velocity for the High Pressure Coolant Injection (HPCI) pumps based on multiples of reference values. These values have been high historically.

The licensee proposed vibration limits that were higher than those allowed by OM-6 for the HPCI pumps. The staff recommended in its July 25, 1990, SE that absolute velocity limits in addition to multiples of reference values be assigned to ensure the HPCI pumps are declared inoperable and corrective action is called for prior to failure. The licensee submitted new multipliers in their October 4, 1991, submittal that were derived from the reference values received from the first inservice tests after the four vane impellers were replaced with the five vane impellers. The licensee also stated that due to this upgrade, a 50% reduction in vibration levels was accomplished although some bearing vibration points were still high. All vibration velocity limits in both the alert and required action ranges with the exception of Unit 2 points 3V and 10V and Unit 3 points 3H and 4H, meet the criteria established in ASME/ANSI OMa-1988, Part 6. Concerning the vibration levels at these Unit 2 and Unit 3 measurement points, the required action multiplier limit was calculated so that the required range would be close to the previous vibration level prior to impeller replacement. By using a smaller multiplier, substantial vibrational increases over time may be adequately detected prior to causing damage to the pump components. Although the absolute value vibrational velocity limits are higher for Unit 2 points 3V and 10V and Unit 3 points 3H and 4H, adequate protection for the pump components may be ensured by the use of a smaller multiplier than that allowed by Part 6. This could yield timely correction of a degraded pump condition for an interim period; however, the licensee is to submit their basis for operability of the pumps at the higher absolute limits in a revised relief request prior to NRC approval of the higher limits for long-term relief. Certain aspects of the staff's concerns identified in the July 17, 1990, SE, have been addressed. The staff finds that immediate conformance with the applicable Code requirements is impractical for your facility and that the proposed alternative is acceptable for the short-term. Accordingly, Relief Request PR-7 may be granted pursuant to 10 CFR 50.55a(g)(6)(i) for an interim period of one year from the date of this SE. During this interim period, the licensee may use the absolute limits proposed in their revised relief request submitted October 4, 1991. In the interim, the licensee is to revise Relief Request PR-7 to justify the operability of the HPCI pumps with the current vibration readings and provide a detailed basis for the proposed absolute limits, including historical data, manufacturer's review of data, and industry experience. The revised relief request is to be submitted to NRC for review and evaluation prior to the expiration of the interim relief.

Item 3:

Relief Request VR-2 requested relief from the test sample expansion requirement for the main steam safety valves if a tested valve fails "as-found" setpoint testing. The staff considered the performance of this test not to be impractical or excessively burdensome to the licensee; in addition, it would be considered non-conservative to omit this testing. In light of this reasoning Dresden Station will expand their IST program as required by ASME Section XI when any one of these valves fails the "as-found" setpoint test. The licensee withdrew the relief request in their July 17, 1991, submittal. No further action on this item is required.

Item 4:

Valve Relief Request VR-5 requests relief from the ASME Code, Section XI, 1977, Edition with Addenda, through Summer 1979, which recommends valve stroke time limits be "...measured to the nearest second or 10% of the maximum allowable stroke whichever is less..." The licensee proposed to utilize the valve stroke time testing requirements of IWV-3413 from a newer edition of the Code, specifically, ASME Section XI, 1980 Edition, with Winter 1981 Addenda, which states that the stroke time of all power operated valves shall be measured to the nearest second, for stroke times 10 seconds or less, or 10% of the specified limiting stroke time for full-stroke times longer than 10 seconds, whenever such a valve is full-stroke tested. This proposal was addressed in two parts. For valves with stroke times less than 10 seconds it may be considered impractical to measure valve stroke times more accurately than to the nearest second. Strict compliance to the aforementioned Code requirements for valves with stroke times less than 10 seconds would be burdensome to the licensee. Measuring stroke times to the nearest second should be adequate to evaluate valve condition. Therefore, for valves with a maximum stroke time of less than 10 seconds relief was granted to measure stroke time to at least the nearest second.

For valves with maximum stroke times greater than 10 seconds, it was the staff's determination that the requirement of the ASME Code, Section XI, Paragraph IWV-3413, 1977 Edition through Summer 1979 Addenda, are not considered impractical or unreasonable. The alternative test included in the revised Relief Request VR-5 submitted by the licensee on July 17, 1991, stated: "The stroke times of all the power operated valves shall be measured to the nearest second." Since the licensee agreed to follow their code of reference for stroke timing valves with maximum stroke times greater than 10 seconds, relief is not required.

Item 5:

Dresden Additional Information/Methodology (DAIM) V1 requested relief from the ASME Code, Section XI, Paragraph IWV-3413(c), requirement to compare stroke time measurements to the previously measured value for all power operated valves with stroke times greater than 2 seconds. Relief was granted provided the licensee assigns limiting values of full stroke time for all power operated valves in their IST program in accordance with NRC Generic Letter No. 89-04, Attachment 1, Position 5. The licensee submitted a revised relief request in their July 17, 1991, submittal. This revised relief request clarified that the limiting value of the full stroke time for each valve would be the more conservative of the values calculated through appropriate multipliers of the reference stroke time or the value derived from the system analysis as contained in the Technical Specifications and/or the Final Safety Analysis Report. This clarification addresses the provision in the staff's SE dated July 25, 1990, and therefore, no additional NRC staff action is required.

Item 6:

Valve Relief Request VR-6 requested relief to perform seat leakage tests on primary containment isolation valves to the criteria set by 10 CFR 50, Appendix J, and plant technical specifications, and to repair or replace as required when the leakage rate exceeds the maximum allowable as stated in the technical specifications or IWV-3427(a). The relief request was granted in the July 25, 1990, letter, provided the licensee followed the direction of Generic Letter (GL) 89-04, Position 10, on containment isolation valve testing. The licensee revised this relief request in their July 17, 1991, submittal to reflect Position 10 of GL 89-04. Since the licensee's alternative testing now incorporates the conditions specified in the staff's July 25, 1990, SE, the staff finds that the alternative will provide an acceptable level of quality and safety, and that the relief request may be granted pursuant to 10 CFR 50.55a(a)(3)(i).

Item 7:

Valve Relief Request VR-8 requested relief to exercise the control rod drive (CRD) alternative rod insertion/anticipated transient without scram air header bleed valves each cold shutdown without stroke timing. These are solenoid operated valves that provide an alternative method of relieving the CRD scram air header of pressure so as to provide CRD insertion. It is impractical to exercise these valves during normal power operations since it would result in a plant shutdown. In addition, it is impractical to stroke time these valves with the usual methods since they are enclosed and the stem position cannot be observed. They are also not equipped with any external valve position indication. System redesign and/or modifications, which would be required to measure stroke times, would be burdensome to the licensee. The licensee submitted a revision to Relief Request VR-8 in their July 17, 1991, submittal. The licensee proposed to exercise the control rod alternate rod insertion/anticipated transient without scram air header bleed valves each cold shutdown. The licensee will verify valve capability to perform its safety function by determining the rate of scram air header pressure drop, specifically, that the scram air header pressure drops from 75 psig to 10 psig within a 15 second time period. Since valve degradation would be evidenced by increased time to depressurize the scram air header pressure, measuring the time to depressurize the scram air header and verifying that it is less than a maximum limiting depressurization time at least each cold shutdown should provide an indication of degradation and reasonable assurance of operational readiness. Relief Request VR-8 may be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Item 8:

Valve Relief Request VR-9 requested relief to exercise the CRD backup scram and scram dump valves each cold shutdown without stroke timing. During normal power operation exercising these valves would result in insertion of all the control rod drives. This is considered impractical. In addition, these valves operate too rapidly and there is no position indication for any practical timing measurements. To obtain accurate stroke times, system

redesign and/or modification would be necessary which would be burdensome to the licensee. It is the staff's determination that compliance with the Code requirements would be impractical. The licensee submitted a revised valve Relief Request VR-9 in their July 17, 1991, submittal. The licensee proposed to exercise these valves, without timing, and verify proper venting, during cold shutdown. The licensee stated in a telephone conference call on November 20, 1991, that the valve capability to perform its safety function will be determined by the rate of scram air header pressure drop, specifically, that the scram air header pressure drops from 75 psig to 10 psig within a 15-second time period. Since valve degradation would be evidenced by increased time to depressurize the scram air header pressure, measuring the time to depressurize the scram air header and verifying that it is less than a maximum limiting depressurization time at least each cold shutdown should provide an indication of degradation and reasonable assurance of operational readiness. The licensee's alternative testing methods to test the CRD backup scram and scram dump valves each cold shutdown and to verify valve capability by monitoring the scram air header pressure are found acceptable by the staff; however, the licensee should clarify that there is valve redundancy present in the system and that, by monitoring only the scram air header pressure, individual valve performance cannot be evaluated. Relief Request VR-9 may be granted pursuant to 10 CFR 50.55a(g)(6)(i), provided the licensee tests each valve individually to the extent practical.

Item 9:

Relief Request VR-10 requested relief from the requirement to perform "as-found" setpoint testing of the Target Rock safety-relief valves. The staff considers the performance of this test not to be impractical or excessively burdensome to the licensee. In addition, the proposal for these valves to have their pilot assembly replaced with a rebuilt and tested assembly each refueling outage and the main valve body replaced every other refueling outage would not detect degradation affecting the valve setpoints and, therefore, is unacceptable. The licensee has agreed to test the Target Rock valves in the "as-found" condition. The licensee withdrew the relief request in their July 17, 1991, submittal. No further action on this item is required.

Item 10:

This anomaly stated that the staff believes the spent fuel pool cooling system at Dresden Units 2 and 3 performs a safety-related function and that the system pumps and valves necessary to fulfill this function should be included in the IST program and be tested to the Code requirements. The licensee has now included the applicable pumps and valves in this system in the IST program, specifically:

Pumps :	2-1902-A/B	and	3-1902-A/B
Valves:	2-1901-27A/B	and	3-1901-27A/B
	2-1901-40	and	3-1901-40

The inclusion of the applicable pumps and valves in the licensee's program addresses the staff's recommendation. No further action on this item is required.

Item 11:

Valve Relief Request VR-13 requested relief to verify closure capability of the core spray system keep fill check valves by disassembly and inspection. Provisional relief was granted if the licensee leak tests the valves in series at least each refueling outage rather than perform a disassembly and inspection each outage. The licensee submitted a revised valve relief request VR-13 in their July 17, 1991, submittal. Since the licensee's alternative testing now incorporates the conditions specified in the staff's July 25, 1990, SE, specifically that this series of valves, 2(3)-1402-34A and 34B, will be leak tested during each refueling outage, the relief request may be granted pursuant to 10 CFR 50.55a(g)(6)(i), due to the impracticality of disassembling these check valves, provided the licensee repairs or replaces both valves if excessive leakage is identified. However, the licensee should remove the disassembly and inspection provision from the relief request and perform this only as a maintenance activity with the applicable post-maintenance testing. It may have been unclear to the licensee that the leak test proposed by the staff was in lieu of disassembly and inspection.

Item 12:

Relief Request VR-14 requested relief to verify the closure capability of the low pressure coolant injection system keep fill check valves by disassembly and inspection. Relief was granted provided the licensee leak tests the valve series at least each refueling outage rather than perform a disassembly and inspection each outage. The licensee submitted a revised valve Relief Request VR-14 in their July 17, 1991, submittal. Since the licensee's alternative testing now incorporates the conditions specified in the staff's July 25, 1990, SE, specifically that this series of valves, 2(3)-1501-67A and 67B, will be leak tested during each refueling outage, the Relief Request VR-14 may be granted pursuant to 10 CFR 50.55a(g)(6)(i), due to the impracticality of disassembling these check valves, provided the licensee repairs or replaces both valves if excessive leakage is identified. However, the licensee should remove the disassembly and inspection provision from the relief request and perform this only as a maintenance activity with the applicable post-maintenance testing. It may have been unclear to the licensee that the leak test proposed by the staff was in lieu of disassembly and inspection.

Item 13:

Relief Request VR-18 requested relief to verify the closure capability of the High Pressure Coolant Injection (HPCI) system keep fill check valves by disassembly and inspection. Relief was granted provided the licensee leak tests the valve series, 2(3)-2345-500 and 2(3)-2345-501, at least each refueling outage. The licensee submitted a revised valve Relief Request VR-18 in their July 17, 1991, submittal. Since the licensee's alternative testing now incorporates the conditions specified in the staff's July 25, 1990, SE, specifically that this series of valves, 2(3)-2345-500 and -501, will be leak tested during each refueling outage, the Relief Request VR-18 may be granted pursuant to 10 CFR 50.55a(g)(6)(i), due to the impracticality of disassembling these check valves, provided the licensee repairs or replaces both valves if

excessive leakage is identified. However, the licensee should remove the disassembly and inspection provision from the relief request and perform this only as a maintenance activity with the applicable post-maintenance testing. It may have been unclear to the licensee that the leak test proposed by the staff was in lieu of disassembly and inspection.

Item 14:

The SE of Relief Request VR-19 granted relief for the licensee to either use the disassembly and inspection procedure proposed in the program or to use functional testing techniques if they can be developed. The revised relief request submitted in their July 17, 1991, letter appears to indicate that the licensee will perform both disassembly and inspection as well as functional testing. It is the NRC's position that disassembly and inspection is not an acceptable alternative when functional testing can be performed. Relief Request VR-19 had been granted in the July 25, 1990, SE; however, the licensee should identify which alternative testing method is to be included in the IST program. Additionally, the licensee should reference the appropriate section of the IST program submittal discussed in the alternative testing of this relief request, if applicable.

Item 15:

Relief Request VR-22 requested relief to part stroke exercise the High Pressure Coolant Injection (HPCI) injection check valve, 2(3)-2301-7, open each cold shutdown and full stroke exercise the valves open and closed each refueling outage. The relief request was granted provided the licensee full stroke exercise these valves open each cold shutdown and according to Paragraph IWV-3522 of Section XI of the ASME Code, measure the force or torque required to exercise the valve and provided that the licensee also full stroke exercise these valves open and closed each refueling outage. The licensee indicated that a mechanical actuator at the valve will be used to exercise these valves open and, according to Paragraph IWV-3522, of Section XI, of the ASME Code, the torque required to move the valve will be measured. The licensee also revised the relief request to reflect the other changes noted above. Since the licensee's alternative testing now incorporates the conditions specified in the staff's July 25, 1990, SE, the relief request VR-22 may be granted pursuant to 10 CFR 50.55a(g)(6)(i) due to the impracticality of part stroke exercising this valve.

2.2 Valve Relief Request VR-26

Relief Request: The licensee requested relief from the requirement to verify closure capability of the Feedwater (FW), Reactor Water Clean Up (RWCU), and High Pressure Coolant Injection (HPCI) check valves quarterly or during cold shutdown periods.

Valve	Size	Description
2-220-59	18.0	FW Check Valve
2-1201-158	8.0	RWCU Check Valve
2-2301-7	14.0	HPCI Injection Check Valve
3-220-59	18.0	FW Check Valve
3-1201-158	8.0	RWCU Check Valve
3-2301-7	14.0	HPCI Injection Check Valve

Licensee's Basis For Requesting Relief: To verify the above check valves closed, requires quantifying leakage with a reverse flow test or seat leakage test. Because the 220-59 valve is normally open and valves 2301-7 and 1201-158 cannot be isolated, no direct or indirect methods exist for quantifying leakage during power operation or cold shutdowns. During cold shutdowns, the condensate/feedwater system is required to be operable in order to maintain reactor water inventory. The normal make-up path to the reactor during cold shutdowns is through the 2(3)-220-59 check valve and therefore the volume containing the above valves cannot be isolated.

Alternative Testing: Operability of the above check valves in the closed position will be verified each reactor refueling outage. Closure will be verified during performance of a leakage rate test in which seat leakage will be quantified for the above valves.

Evaluation: To verify the closure capability of the FW, RWCU, and HPCI valves requires measurement of leakage with a seat leakage test or a reverse flow test. Due to system design the RWCU and HPCI check valves can not be isolated either during normal power operations or during cold shutdown. To test the RWCU and HPCI valves in the closed position would require the installation of test equipment which would be burdensome to the licensee. The feedwater check valves are open under normal operations and are required to remain in the open position during cold shutdowns to maintain reactor water inventory. Testing of this valve would require closure of the valve disk and isolation of reactor water flow and would cause subsequent system trips on low level reactor water inventory. There is no direct or indirect method for measuring leakage rates during power operations or cold shutdowns that would be practical and to impose the Code requirement would be burdensome to the licensee. The licensee submitted a valve Relief Request VR-26 in their July 17, 1991, submittal and proposed to verify the operational readiness of these check valves each refueling outage. The closure capability will be verified by measuring the seat leakage during performance of a leakage rate test. The licensee's proposal to verify closure of the RWCU, HPCI, and FW check valves each refueling outage during performance of a leak rate test is found acceptable by the staff and the relief request VR-26 may be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.3 Valve Relief Request VR-25

Valve Relief Request VR-25 was included in the licensee's October 4, 1991, submittal for clarification purposes. The revised valve Relief Request VR-25 was evaluated by NRC in a SE dated June 26, 1991. The proposed alternative

testing was found acceptable to the staff and the request for relief was granted pursuant to 10 CFR 50.55a(a)(3)(i) and (g)(6)(i). No further action on this request for relief is required.

2.4 Pressure Isolation Valves

The licensee discusses pressure isolation valves in DAIM V-2. During the staff's review, it was identified that certain aspects of the information appear to conflict with licensee's response to Generic Letter 87-06, "Periodic Verification of Leak Tight Integrity of Pressure Isolation Valves," dated June 11, 1987. The licensee should review the testing of these valves and determine if revisions to the IST program are necessary.

3.0 CONCLUSION

The staff has determined in granting these relief requests, pursuant to 10 CFR 50.55a(a)(3)(i) and (g)(6)(i), that the proposed alternative testing would provide an acceptable level of quality and safety, or that the ASME Code requirements at issue are impractical for your facility. The staff has further determined that the relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest.

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Date: April 2, 1992