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

COMMONWEALTH EDISON COMPANY

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

In Commonwealth Edison Company's (CECo, the licensee) submittal dated February 28, 1992, the updated IST program for Dresden Nuclear Power Station, Units 2 and 3, was provided. The program was developed to the 1986 Edition of ASME Section XI. The interval is from March 1, 1992, to February 28, 2002. The licensee requested exigent review of eleven of the relief requests which were new or significantly revised from the previous interval. Of these eleven, Relief Requests RV-03A, RV-03C, RV-47A, RV-66A, and RP-19A are identified as relating to non-Code components outside the scope of 10 CFR 50.55a, and, therefore, do not require NRC approval for implementation. Evaluations of the other six relief requests are provided below. A summary of the status of these six relief requests is provided in Table 1. The remaining relief requests in the program submittal will be reviewed and evaluated at a later date.

2.0 RELIEF REQUEST RV-23E

The licensee has requested relief from the test frequency and exercise procedure requirements of Section XI, IWV-3521 and IWV-3522, for the Class 2 high pressure coolant injection (HPCI) turbine exhaust check valves 2(3)-2301-34, -45, -71, and -74. The licensee has proposed to verify closure during Appendix J leak rate testing.

2.1 Licensee's Basis for Relief

The licensee states: "These valves have a safety function in the open direction for proper operation of the HPCI system and they also have a safety function in the closed direction for primary containment isolation.

These valves are considered to be open as demonstrated during HPCI surveillance tests. To verify closure, as is required for containment isolation, these valves will be tested during the leakage test requirements of Category A testing.

Verification that these valves are closed is not possible during normal operation since they open when operating the HPCI turbine. Verification of

closure would require securing the HPCI turbine. This is not a safe practice and would require Dresden to enter a limiting condition or operation with the HPCI system inoperable.

These valves are leak rate tested per Appendix J requirements every reactor refueling outage."

2.2 Alternate Testing

The licensee proposes: "These valves will be exercised closed each reactor refueling outage during the Appendix J leak rate test and verified open quarterly."

2.3 Evaluation

The requirements for check valve stroking are to assess for degrading conditions in the functioning of the valves. Verification of closure also ensures that no condition or obstruction is causing the disc to remain partially open. The subject valves open during the quarterly HPCI pump surveillance tests. The licensee states that verification of closure would require securing the HPCI turbine, and that this is not a safe practice and would require entry into a Technical Specification Limiting Condition for Operation (LCO). Entry into an LCO is not, alone, justification for the impracticality of inservice testing; however, the time limitations of the LCO may contribute to impracticality. Additionally, the licensee has not discussed the impracticality of the verification of closure during cold shutdown. Therefore, long-term relief cannot be granted.

Because the proposed alternative testing provides an acceptable level of assurance of the operational readiness of these valves for the near-term, interim relief can be granted to allow a period for the licensee to further evaluate the inservice testing requirements. Immediate imposition of the Code requirements would require a plant shutdown, or the implementation of a test method not yet developed, either of which would be a hardship on the licensee when there is no evidence that the condition of the valves is unacceptable.

2.4 Conclusion

The staff finds that the proposed alternative will provide an acceptable level of quality and safety for an interim period, and further finds that if the Code requirements were immediately imposed, this would cause hardship without an increase in the level of quality and safety. Accordingly, interim relief is granted for a period of one year or until the next refueling outage, whichever is later, for the HPCI turbine exhaust valves, from the exercising requirements of IWV-3521 and IWV-3522, pursuant to 10 CFR 50.55a (a)(3)(ii). In the interim period, the licensee is to further evaluate the inservice testing requirements and implement testing in accordance with the Code, or provide additional justification of the impracticality of the Code requirements.

3.0 RELIEF REQUEST RV-23

The licensee has requested relief from the test frequency and exercise procedure requirements of Section XI, IWV-3521 and IWV-3522, for the high pressure coolant injection (HPCI) gland seal condenser check valves 2(3)-2301-50A, -51, -75, and -76. The licensee has proposed to verify operability by disassembly and inspection with a sampling technique described in the licensee's IST program.

3.1 Licensee's Basis for Relief

The licensee states: "The HPCI auxiliary cooling water pump and the HPCI booster pump supply cooling water to the gland seal condenser through the 2301-50A and 2301-51 check valves. The cooling water exits the gland seal condenser through the 2301-75 check valve either to the HPCI booster pump suction line or the condensate storage tank. The steam being cooled in the condenser is pumped by the gland seal leak off pump through the 2301-76 check valve either to the HPCI booster pump suction line or the condensate storage tank.

Exercising open these check valves requires verifying design accident flow during testing. Since there are no pressure or flow instruments in any of these lines, no direct or indirect method is available to quantitatively prove these valves open.

To verify closure requires either a reverse flow or seat leakage test. Since there is no instrumentation in the lines, testing for reverse flow closure can not be performed. A seat leakage test can not be performed because boundary valves necessary to pressurize the check valves do not exist."

3.2 Alternate Testing

The licensee proposes: "Operability of these HPCI check valves will be verified by disassembly and inspection in accordance with the sampling technique discussed in TV-00C."

3.3 Evaluation

The requirements for check valve stroking are to assess for degrading conditions in the functioning of the valves. Verification of closure also ensures that no condition or obstruction is causing the disc to remain partially open. The staff recognizes that there were system designs which did not enable testing of check valves with full flow to verify opening, or which did not include provisions to verify closure. For the subject valves, it is impractical to measure flow through the valves based on the design of the system and it would be a burden to require the licensee to install instrumentation.

An acceptable alternative to the Code requirements is described in GL 89-04, Attachment 1, Position 2, which provides the guidance for implementing a

disassembly and inspection program for check valves. This method is a maintenance activity and is not considered a substitute for testing when practical, particularly to verify the capability of a valve to close. However, when no other practical means exist to exercise a check valve, GL 89-04 has approved the alternative, provided the guidance delineated in Position 2 is followed. Therefore, the licensee should ensure that the program for disassembly and inspection of check valves is documented in the IST program (as in this relief request and TV-00C) and is in accordance with the guidance in Position 2; otherwise, it is not considered an acceptable alternative.

3.4 Conclusion

Based on the impracticality of testing in accordance with the Code and the burden of imposing the requirements, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) and is consistent with GL 89-04 paragraph "IST Program Approval," provided the guidance delineated in Position 2 is followed. The implementation of Position 2 is subject to NRC inspection.

4.0 RELIEF REQUEST RV-23H

The licensee has requested relief from the requirements of IWV-3410 and IWV-3415 for valve exercising and fail-safe testing for the high pressure coolant injection (HPCI) drain pot solenoid valves, 2-2301-32 and 3-2301-32. These valves are 1", Class 2, Category B valves.

4.1 Licensee's Basis for Relief

The licensee states: "These valves are in-line solenoid valves which open to drain the turbine exhaust drain pot when a high level alarm in the drain pot is received. The only way to receive a high level alarm is if the normal drain path to the Torus is blocked or isolated. To test the valve in the open direction would require isolating the drain path to the Torus during quarterly HPCI IST testing and verifying that the alarm comes up and clears. This is not practical during HPCI runs. These valves close when the alarm is cleared.

These solenoid valves are totally enclosed with no evidence of position indication available. No other direct or indirect method is available for verifying valve disk position.

These valves can be opened by a handswitch, but verification that the valves open or close is not achievable. There are no valve position indicating lights available. Although the valve does open on high drain pot level, this type of verification cannot be repeated during operations or cold shutdowns."

4.2 Alternative Testing

The licensee proposes: "Since there is no practical method of verifying these valves open or closed, during refuel outages the drain pot will be filled with

water until the high level alarm is received. The water will then be turned off and it will be verified that the alarm clears."

4.3 Evaluation

For power operated valves, the Code requires valve stroke time and fail-safe testing quarterly, or during cold shutdowns, to identify degrading conditions before unacceptable operation of the valve occurs. The licensee indicates that the subject valves cannot be tested in accordance with the Code requirements during power operations or at cold shutdown conditions because they have no position indication and there is no visible means to observe change of position. Therefore, with the design limitations, exercising and fail-safe testing the HPCI drain pot solenoid valves, in accordance with the requirements of Section XI, with verification of disc movement quarterly or during cold shutdown is not practical using conventional methods (stopwatch used while observing position indicating lights has been the typical method to measure stroke time). However, test methods have been developed and are available which may provide a means to measure the stroke time of these valves. Therefore, long-term relief cannot be granted. However, to investigate, develop, and implement these test methods is expected to take greater than 90 days and an interim period of relief is necessary to prevent noncompliance.

The proposed test frequency for performing verification that the valves open and close by filling the drain pot with water until the high level alarm is received is a reasonable alternative to the Code frequency for an interim period because it does provide evidence that the valve disc moves. The proposed alternative testing will meet the intent of the Code, in part, to verify the valves stroke by verifying the position of the valve using an alternate parameter (water level alarm), though the full intent of the Code in monitoring the valves for degradation will not be met by this testing.

It is impractical to perform the test by conventional methods which meets the Code requirements within the limitations of the design of the system. Alternative methods will be required to meet the Code requirements. Immediate imposition of the Code requirements would result in a plant shutdown solely to perform testing with methods not yet available to the licensee.

The licensee's basis does not discuss the impracticality of a simple exercise of the valves quarterly or during cold shutdown conditions, even though verification that the valve strokes cannot be performed at conditions other than during refueling outages, using current test methods. Because exercising solenoid valves periodically can contribute to prevention of internal binding or sticking failure modes (reference GL 91-15, NUREG-1275, Volume 6), exercising quarterly or during cold shutdown, though not verifying position, should continue unless the licensee has specific reasons why this is not practical. The relief request indicates the valves can be exercised by means other than a high level signal. Exercising the valves quarterly or during cold shutdown is consistent with the Code requirements, also, even though the stroke cannot be timed or verified by this testing. Therefore, quarterly or

cold shutdown stroking is to be performed in the interim period unless this would adversely affect system operations or is otherwise impractical.

Relative to monitoring the solenoid valves for degradation, because the alternative test method does not allow for measuring stroke time in accordance with IWV-3413, the licensee must determine a method which will provide a means of assessing the condition of the valves. Methods which might provide acceptable alternatives to IWV-3413 could be (1) measurement of the coil impedance or resistance, (2) acoustics, or (3) a regular preventative maintenance which assesses the internal condition of the valves and ensures proper operation of the valves electrically.

4.4 Conclusion

Relief to test the HPCI drain pot solenoid valves at a refueling outage frequency and monitoring disc movement by water level in the drain pot is granted for an interim period of one year or until the next refueling outage, whichever is later, pursuant to 10 CFR 50.55a(g)(6)(i) based on (1) the impracticality of performing the Code required testing quarterly or during cold shutdown conditions with the current design and conventional test methods, (2) consideration that imposition of the Code requirements would result in a plant shutdown, and (3) the proposed testing providing an acceptable alternative for assessing the operational readiness of the valves for an interim period. The licensee is to exercise these valves quarterly or during cold shutdown, as practical, as an additional measure to prevent binding.

During this interim period, the licensee is to investigate other test methods and implement a method for assessing the condition of these valves. A revised relief request is to be submitted as applicable.

5.0 RELIEF REQUEST RV-24A

The licensee has requested relief from exercising the containment air monitor (CAM) isolation valves, 2-2499-28A/B and 3-2499-28A/B, quarterly or during cold shutdowns as required by IWV-3521 and IWV-3522. These valves are 0.5", Class 2, Category A/C, check valves.

5.1 Licensee's Basis for Relief

The licensee states: "These valves are normally open and are required to close for containment isolation. Additionally, they are required to be open for proper operation of the containment atmosphere monitor system. To verify closure would require securing the system, disassembling the process line and back pressurizing with air. Forward flow testing also would be performed at this time. This test is impractical to perform during normal operation or cold shutdowns because primary containment would be violated and additionally, disassembling the piping during cold shutdowns could delay the unit startup."

5.2 Alternative Testing

The licensee proposes: "These valves will be exercised open and closed each reactor refueling outage."

5.3 Evaluation

The requirements for check valve stroking are to assess for degrading conditions in the functioning of the valves. Verification of closure also ensures that no condition or obstruction is causing the disc to remain partially open. The safety function of these valves is to close upon actuation of a containment isolation signal. There are no instruments on the upstream side between these check valves and the hydrogen/oxygen analyzers. The closure function, within the limits of the design of the system, must be demonstrated by opening (disassembling) the upstream line and pressurizing the downstream side of the check valves. Opening this line is not feasible during power operations or during cold shutdown conditions when containment integrity must be maintained. Therefore, testing in accordance with Code requirements is impractical due to limitations of design. Testing at a refueling outage frequency provides an acceptable level of assurance of the operational readiness of these valves considering the impracticality of testing quarterly or during cold shutdown conditions. Imposition of the Code requirements would be a burden in that testing would require compromising containment integrity at power or during cold shutdown conditions when it would otherwise be maintained, and could result in an extension of a cold shutdown, delaying plant startup.

5.4 Conclusion

Relief is granted for extending the test interval to a refueling outage frequency for CAM containment isolation check valves 2-2499-28A/B and 3-2499-28A/B pursuant to 10 CFR 50.55a(g)(6)(i) based on (1) the impracticality of performing the testing at the Code required frequency, (2) the burden if Code requirements were imposed, and (3) the proposed alternative testing providing an acceptable level of assurance of the operational readiness of the valves.

6.0 RELIEF REQUEST RV-25A

The licensee has requested relief from exercising the atmospheric containment atmosphere dilution (ACAD) isolation 1" check valves, 2-2599-23A/B, 2-2599-24A/B, 3-2599-23A/B, and 3-2599-24A/B, in accordance with IWV-3521 and IWV-3522 for test frequency.

6.1 Licensee's Basis for Relief

The licensee states: "These valves are normally closed and are required to close for containment isolation. They are required to be open for proper operation of the ACAD system. To verify closure would require securing the system, disassembling the process line, and back pressurizing with air. This test is impractical to perform during normal operation or cold shutdowns

because primary containment would be violated and additionally, disassembling the piping during cold shutdowns could delay the unit startup.

To full stroke exercise open the ACAD check valves requires injecting air at a rate of 5000 [standard cubic feet per hour] scfh into the drywell and torus while inerted at 1.1 to 1.3 psig with nitrogen. The normal oxygen concentration of containment is 2.0% with alarms set at 3.5%.

Allowing oxygen to be injected into the drywell and torus each quarter to perform inservice testing would eventually require venting the drywell and torus and purging with nitrogen so as not to exceed the limits for containment oxygen concentration.

Additionally, failure of the check valves in the open position during testing could place the plant in a Limiting Condition for Operation. This would reduce the availability of the ACAD system to operate correctly under abnormal conditions.

To exercise these valves open during operations or cold shutdowns is undesirable because the drywell is inerted and the addition of oxygen to the drywell would require additional monitoring and operational constraints."

6.2 Alternative Testing

The licensee proposes: "These valves will be exercised each reactor refueling outage."

6.3 Evaluation

The requirements for check valve stroking are to assess for degrading conditions in the functioning of the valves. Verification of closure also ensures that no condition or obstruction is causing the disc to remain partially open. The ACAD system injects air into containment post-accident to dilute combustible gases. The containment isolation valves in this system are normally closed and remain closed upon initiation of a containment isolation actuation.

The system design does not allow performance of full stroke inservice testing at power conditions, or during cold shutdowns when the drywell remains inerted, as discussed in the basis for relief without extensive efforts and potential personnel hazards. However, the licensee has not discussed the impracticality of verifying that these valves (individually, or in pairs) are closed (without opening first), quarterly or during cold shutdown, using installed pressure instrumentation and performing closure verification when the drywell is inerted (reference drawing M-707-1).

Extension of the test frequency for an interim period is necessary based on the hardship of performing the testing at the Code required frequency within the limitations of the design of the system and current testing methods. Immediate imposition of the Code requirements would be a hardship on the

licensee in that (1) the containment drywell would have to be inerted at each cold shutdown, delaying plant startup, (2) design modifications would be necessary to preclude deinerting each cold shutdown to allow for testing, or (3) an operational method of injecting air and purging air consecutively during full-flow open stroke testing, then disassembling the piping to verify the closure function of the valves, would potentially delay plant startup. However, long-term relief cannot be granted as requested until the licensee investigates the practicality of verification of closure at the Code required frequency using installed pressure instrumentation and performing closure verification when the drywell is inerted.

Considering the hardship of performing the testing with the current design and testing methods, the proposed alternative testing provides an acceptable level of assurance of the operational readiness of these valves for an interim period. Therefore, no compensating increase in the level of quality and safety would be gained by immediate imposition of the Code requirements.

6.4 Conclusion

Interim relief is granted to extend the test interval from quarterly/cold shutdown to each refueling outage for the ACAD containment isolation valves, for a period of one year or until the end of the next refueling outage (whichever is later), pursuant to 10 CFR 50.55a(a)(3)(ii) based on (1) the hardship of performing the testing in accordance with Code requirements, (2) the burden if Code requirements were imposed, and (3) the proposed alternative testing providing an acceptable level of assurance of the operational readiness of these valves for an interim period. In the interim, the licensee is to investigate the practicality of performing verification of valve closure capability at the Code required frequency.

7.0 RELIEF REQUEST RV-57A

The licensee has requested relief from the requirements of IWV-3413 to measure the stroke time of valves 2/3-5741-62, 2.5", Category B, Class 3, control room HVAC refrigerant service water outlet flow control valve.

7.1 Licensee's Basis for Relief

The licensee states: "This valve controls the cooling water flow through the Control Room HVAC refrigerant heat exchanger. The valve receives a signal from a pressure transmitter located on the refrigerant side. When the pressure increases due to the refrigerant temperature rising, the 2/3-5741-62 throttle opens further to allow more cooling. Similarly, the valve throttles flow down when the pressure drops. Since the valve opens and closes based on a signal from a pressure transmitter, the valve cannot be accurately timed."

7.2 Alternative Testing

The licensee proposes: "This valve will be fail safe tested quarterly by isolating the air to the valve without timing."

7.3 Evaluation

Stroke time measurements are required for monitoring changes which could be indicative of degrading conditions in a power operated valve. The design of the valve control system does not allow for accurately measuring the stroke time, making it impractical to meet the Code requirements for testing this valve with the current design. However, while the proposed alternative provides a level of assurance of the operational readiness of the valve for an interim period, long-term relief cannot be granted. The alternative includes no means of monitoring for degrading conditions in the operation of the valve. Immediate imposition of the Code requirements would be a burden in that testing to meet the Code could not be performed until design modifications, testing methods, and procedures are developed, necessitating a plant shutdown of both units due to the unavailability of this system until testing is completed. Therefore, an interim period should be allowed to ensure that these actions can be taken in an effective manner, while continuing to perform the alternative testing.

7.4 Conclusion

Interim relief for one year, or until the end of the next refueling outage (whichever is later) is granted, for control valve 2/3-5741-62, pursuant to 10 CFR 50.55a(g)(6)(i) based on (1) the impracticality of measuring stroke times within the limitations of the current design, (2) the burden on the licensee if the Code requirements were immediately imposed, and (3) the alternative testing providing an acceptable level of assurance of the operational readiness of the valve for an interim period. In the interim, the licensee is to develop and implement a method to monitor the valve for degrading conditions. Methods employing techniques such as acoustics, electrical resistance, local observation of stem movement, or an enhanced preventative maintenance program with specific checks of the conditions of the parameters that could impact the capability of the valve to function to the fail-safe position could be acceptable.

8.0 CONCLUSION

As detailed above, the relief requests are granted pursuant to 10 CFR 50.55a(a)(3)(i), (a)(3)(ii) or (g)(6)(i). 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.

Principal Contributors: J. Colaccino
P. Campbell

Date: September 11, 1992

Table 1
Safety Evaluation
Summary of Relief Requests
Dresden Nuclear Power Station, Units 2 and 3

Relief Request Number	SE Section	Section XI Requirement and Section	Equipment Identification	Alternate Method of Testing	Action by NRC
RV-23E	2.0	Test Frequency and Exercising Procedure, IWV-3521 and IWV-3522	High Pressure Coolant Injection Turbine Exhaust Check Valves	Exercise Closed Each Reactor Refueling Outage During Appendix J Testing and Verify Open Quarterly	Interim Relief Granted for One Year or Until the Next Refueling Outage Per 10 CFR 50.55a (a)(3)(i)
RV-23G	3.0	Test Frequency and Exercising Procedure, IWV-3521 and IWV-3522	High Pressure Coolant Injection Gland Seal Condenser Check Valves	Verify Operability by Disassembly and Inspection Program	Approved Per GL 89-04, Position 2 and 50.55a (g)(6)(i)

Relief Request Number	SE Section	Section XI Requirement and Section	Equipment Identification	Alternate Method of Testing	Action by NRC
RV-23H	4.0	Valve Exercising Frequency and Fail-Safe Testing, IWV-3410 and IWV-3415	High Pressure Coolant Injection Drain Pot Solenoid Valves	During Refuel Outages, Fill Drain Pot Until High Level Alarm is Received, Turn Off Water and Verify Alarm Clears	Relief Granted for IWV-3410 and IWV-3415 Per 10 CFR 50.55a (g)(6)(i); Interim Relief Granted for Not Measuring Stroke Time Per 10 CFR 50.55a (g)(6)(i) for One Year or Until the Next Refueling Outage
RV-24A	5.0	Test Frequency and Exercising Procedure, IWV-3521 and IWV-3522	Containment Air Monitor Isolation Valves	Exercise Valves Open and Closed Each Reactor Refueling Outage	Relief Granted Per 10 CFR 50.55a (g)(6)(i)
RV-25A	6.0	Test Frequency and Exercising Procedure, IWV-3521 and IWV-3522	Containment Atmosphere Dilution Isolation Valves	Exercise Valves Each Reactor Refueling Outage	Interim Relief Granted Per 10 CFR 50.55a (a)(3)(ii) for One Year or Until the Next Refueling Outage

Relief Request Number	SE Section	Section XI Requirement and Section	Equipment Identification	Alternate Method of Testing	Action by NRC
RV-57A	7.0	Measure Stroke Time Per IWV-3413	Control Room HVAC Refrigerant Service Water Outlet Flow Control Valve	Fail-Safe Test the Valve Quarterly by Isolating the Air to Valve Without Timing	Interim Relief Granted Per 10 CFR 50.55a (g)(6)(i) for One Year or Until Next Refueling Outage