



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO INSERVICE TESTING PROGRAM RELIEF REQUESTS FOR
COMMONWEALTH EDISON COMPANY
AND
MIDAMERICAN ENERGY COMPANY
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Code and applicable addenda, except where relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 10 CFR 50.55a(f)(6)(i), (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that: (1) conformance is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Section 50.55a(f)(4)(iv) provides that inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval.

Nuclear Regulatory Commission (NRC) guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 3, 1989, provided alternatives to the ASME Code requirements that have been determined to be acceptable to the staff and authorized the use of the alternatives in Positions 1, 2, 6, 7, 9, and 10 provided the licensee follow the guidance delineated in the applicable positions. When a proposed alternative is in accordance with GL 89-04 guidance and documented in the IST program, no further evaluation by the staff is required; however, implementation of the alternative is subject to a staff inspection.

Section 50.55a authorizes the Commission to grant relief from ASME Code requirements or to approve proposed alternatives upon making the necessary findings. The staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternative as part of the licensee's IST program are contained in this safety evaluation (SE).

In a letter dated May 2, 1995, Commonwealth Edison Company (ComEd, the licensee) submitted Revision 5 to its third 10-year interval IST program for

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pumps and valves. A description of Revision 5 of the IST program is in Attachment 1 to the licensee's letter and is the latest revision of the IST program submitted to the staff. The IST program covers the third 10-year interval from February 18, 1993, to February 17, 2003, for Unit 1 and March 10, 1993, to March 9, 2003, for Unit 2.

The IST program has been updated to the requirements of the 1989 Edition of Section XI of the ASME Code. The 1989 Edition of ASME Code Section XI was incorporated into 10 CFR 50.55a by rulemaking effective September 1992 (see 57 Federal Register 34666). This edition of Section XI provides that the IST rules for valves shall meet the requirements set forth in ASME Operations and Maintenance Standard Part 10 (OM-10), "Inservice Testing of Valves in Light-Water Reactor Power Plants," and Part 6 (OM-6), "Inservice Testing of Pumps in Light Water Reactor Power Plants," of the ASME Operation and Maintenance Standard OMa-1988.

In Revision 5 of the IST program, the licensee has made changes to the relief requests previously submitted to the staff for the program. These changes are listed in Section 2 of the Executive Summary to the IST program (Attachment 1 of the licensee's May 2, 1995, letter). The list of the relief requests for Revision 5 of the IST program are in Sections 2.7 (for pumps) and 3.7 (for valves) of the IST program description. The changes to the relief requests in the IST program are shown in Table 1 of this SE.

The valve relief requests that were rewritten are being treated by the staff as also being deleted from the IST program because the refuel justifications and technical positions are not requests for relief. However, for several rewritten and "thus deleted" relief requests, a previous relief request was assigned the same number (e.g., RV-00E to RV-00A, and RV-00F to RV-00B) or a new relief request was assigned the same number (i.e., RV-07A and RV-00C).

Also, a rewritten or new valve relief request was sometimes given the suffix Revision 5 to distinguish it from the previous relief request (i.e., RV-07A Rev. 5 and RV-00C Rev. 5 versus the previous Revision 4). These suffixes, however, were not identified in Section 3.7 of the valve relief requests for the IST program. These renumbered and new relief requests were evaluated by the staff. See Table 1 of this SE.

The revised relief requests were also renumbered except for RV-30A.

The staff's previous evaluation of the licensee's IST program that the licensee submitted by letters dated January 7 and October 28, 1993, is in the SE enclosed with the staff's letter dated May 3, 1994. In that SE, the staff evaluated the previously submitted relief requests and identified eight anomalies in the IST program. The anomalies were discussed in the technical evaluation report attached to that SE. The licensee's May 2, 1995, submittal included the licensee's responses to the eight anomalies identified in the technical evaluation report.

Evaluations of (1) the responses to the eight anomalies and (2) the new and revised relief requests listed in Table 1 are provided below. The relief requests listed in Table 1 that were rewritten as refueling justifications or

technical approaches were not evaluated because they are no longer requests for relief from the ASME Code.

2.0 SUMMARY OF ANOMALY RESPONSES TO SE DATED MAY 3, 1994

There were eight IST anomalies of the previous revision to the IST program identified in Appendix A of the technical evaluation report attached to the staff's SE dated May 3, 1994, on the licensee's third 10-year interval IST program for pumps and valves. The licensee's responses to these anomalies are included in a cross-reference of the anomaly resolution to the IST program. This cross reference is Attachment 2 to the licensee's letter dated May 2, 1995.

The anomalies and the results of the staff's evaluations of the licensee's responses to these anomalies are in Table 2. Based on Table 2, the staff's review of the licensee's response to these eight anomalies is concluded and further action by the licensee is only required for Anomalies 2 and 3.

3.0 RELIEF REQUEST EVALUATIONS

The new and revised relief requests listed in Table 1 are addressed in the following sections:

3.1 Revised Relief Request RP-00A Addendum

RP-00A Addendum, now designated by the licensee as RP-23A, has been revised to reflect the station's current maintenance plan for reducing vibration levels on the Unit 2 high pressure core injection (HPCI) pump. In the SE dated May 3, 1994, interim relief was granted pursuant to 10 CFR 50.55a(a)(3)(ii) until the refueling outage scheduled for 1996 to use an alert value of 0.425 inches per second allowed (ips) in lieu of 0.325 ips for the pumps in question. The granting of such interim relief does not change because of this revision to RP-00A Addendum.

3.2 New Relief Requests RP-23B and RV-07A (Revision 5)

For these relief requests, the pumps and valves in question are not identified as ASME Code Class 1, 2, or 3; therefore, they are not subject to IST in accordance with 10 CFR 50.55a. No relief request from IST requirement is required.

3.3 Revised Relief Request RV-00D

RV-00D, now designated by the licensee as RV-02A, has been revised to limit the requested relief to only main steam isolation valves (MSIVs). In the SE dated May 3, 1994, relief was granted pursuant to 10 CFR 50.55a(f)(4)(iv) to use a required action range of <3.0 and ≥ 5.0 seconds for the MSIV stroke time provided all related requirements of OM-10 are met. The granting of this relief for MSIVs does not change because of this revision to RV-00D.

3.4 Revised Relief Requests RV-00E and RV-00F

The staff indicated in its SE dated May 3, 1994, that these relief requests are approved by GL 89-04, Position 2, but that the licensee should consider non-intrusive techniques to verify the full-stroke capability of the check valves in the relief requests. In a letter dated May 2, 1995, the licensee renumbered RV-00E and RV-00F as RV-00A and RV-00B, respectively; and made changes to the scope identified in the Component Identification section for both requests. No changes were made to the basis for requesting relief and the proposed alternative in the new RV-00A and RV-00B. In the SE dated May 3, 1994, relief was granted for RV-00E and RV-00F because they are authorized by GL 89-04. The granting of relief for RV-00E and RV-00F applies to the new RV-00A and RV-00B because of this revision to RV-00E and RV-00F.

3.5 Revised Relief Request RV-30A

The licensee, in the revised RV-30A, requested relief from the stroke time testing requirements of OM-10, Paragraph 4.2.1, for dual function safety/relief valves 1-0203-003A-RV and 2-0203-003A-RV; electromatic relief valves 1-0203-003-B, -C, -D, -E; and power operated relief valves (PORVs) 2-0203-003-B, -C, -D, -E. Valves 1-0203-003A-SO and 2-0203-003A-SO were not evaluated since they are not identified as ASME Code Class 1, 2, or 3 and, thus, are not subject to IST per 10 CFR 50.55a. This revision includes provisions for testing the PORVs that will be installed.

In the SE dated May 3, 1994, the staff approved relaxing the exercising frequency from every three months to every six months and allowed an interim period of one year or the next refueling outage, whichever is longer, for the licensee to develop a method to monitor for valve degradation. In the SE, the staff stated that if stroke time measurements are used to monitor valve degradation, the licensee should assign a maximum stroke time based on test data and take corrective action if the maximum value is exceeded.

In the revised RV-30A, the licensee proposed assigning a maximum stroke time of two seconds and to require corrective action when the stroke time is not within three seconds. This is consistent with the statements in the SE dated May 3, 1994, and the OM-10 stroke testing requirements of Paragraph 4.2.1.8(e) for rapid-acting valves. OM-10, Paragraph 4.2.1.4.(b) requires measurement of stroke time to at least the nearest second. Based on the Code's allowance for rounding off stroke times to the nearest second, the licensee's proposal to assign a maximum stroke time of two seconds and take corrective action when the stroke time is not within three seconds meets the OM-10, Paragraph 4.2.1, requirements and a relief request is not required.

If better accuracy can be achieved in measuring the valve stroke time, the staff recommends that the licensee take corrective action when the actual measured stroke time exceeds two seconds.

3.6 New Relief Request RV-00C

In RV-00C, the licensee requests relief from the test method and frequency requirements of OM-10, Paragraph 4.3.2, for verifying the closure capability

of check valves 1001-131, -132, -136A, -136B, -137A, -137B, -139, -140, and check valves 1402-064A, -064B, -065A, -065B in the Units 1 and 2 core spray and residual heat removal (RHR) systems. The licensee proposed to verify the valve's closure capability by testing each closed coupled pair as a unit.

Valves 1001-137A, -137B, and -140 for Units 1 and 2 are not identified as ASME Code Class 1, 2, or 3; therefore, these valves are not evaluated in this SE, since they are not subject to IST per 10 CFR 50.55a.

3.6.1 Licensee's Basis for the Relief Request

These core spray and RHR check valves must close to prevent diversion of injection flow. The Quad Cities licensee conducted a detailed evaluation of the testability of the subject valves and concluded that there is no direct or indirect means of verifying that an individual check valve can close by either a reverse flow or a leak test. However, these check valves are close coupled pairs of valves in series and each pair can be verified to prevent backflow as a unit. Only one valve in each pair is required to close to perform the intended safety function.

3.6.2 Alternate Testing

The backflow prevention capability of the subject check valves will be verified by testing each close coupled pair as a unit. If the unit fails the backflow prevention acceptance criteria, both valves in the series pair will be repaired or replaced.

3.6.3 Evaluation

The ASME Code requires valves performing a safety function to be stroked to the position required for the safety function. For the valves in question, the safety function is to close to prevent diversion of safety injection flow from the reactor coolant system. The licensee's basis to this facility does not require both series valves to close in order to prevent flow diversion.

The licensee indicated that the pair of check valves in series can not be individually verified for closure and that only one valve in each pair is required to close to perform the intended safety function. The licensee stated that if the pair in series fails the test, both valves in the series pair will be repaired or replaced.

As indicated in Section 4.1.1 of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," dated April 1995, the verification that a pair of valves is capable of closing is acceptable for IST if individual testing of the valves is impractical and only one in the pair is needed to perform the safety function. The alternative proposed by the licensee is, therefore, consistent with the recommendations in NUREG-1482 and provides a reasonable assurance of operational readiness of the pair of valves.

3.6.4 Relief Request RV-00C Conclusion

The staff has determined that, in cases where individual testing of pairs of valves is impractical and closure of one valve in the series pair is sufficient to meet system requirements, testing the series pair of valves as a unit provides adequate assurance of the pair's capability to perform its safety function. Based on the determination that the licensee's testing provides an acceptable level of quality and safety, the proposed alternative valve testing in RV-00C is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

4.0 CONCLUSIONS

Based on its review of the May 2, 1995, submittal on Revision 5 of the licensee's third 10-year interval IST program for pumps and valves, the staff concludes the following:

1. The proposed alternative is authorized for the new relief request RV-00C (Revision 5).
2. The granting of relief in the staff's SE dated May 3, 1994, remains unchanged for the revised relief requests RP-00A Addendum, RV-00D, RV-00E, and RV-00F. RV-00E and RV-00F were renumbered RV-00A and RV-00B and the granting of relief for RV-00E and RV-00F applies to RV-00A and RV-00B.
3. No relief requests are required for RP-23B, RV-07A (Revision 5), and RV-30A, because the pumps and valves associated with these relief requests either meet or are not covered by the ASME Code, Section XI, requirements.
4. The licensee's investigation of NIT testing addressed in Anomaly 3 (Table 1 above) should continue for the valves involved with relief requests RV-00E and RV-00F, and these relief requests should be deleted or revised by the licensee if the investigation proves successful.
5. As addressed in Anomaly 2 (Table 1 above), supporting documentation for relief requests that comply with GL 89-04 Positions should be available to the staff during inspections.

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Date: November 1, 1995

TABLE 1 CHANGES TO THE PUMPS AND VALVES RELIEF REQUESTS
REVISION 5 OF THE LICENSEE'S THIRD 10-YEAR INTERVAL IST PROGRAM

CHANGES*		RELIEF REQUESTS
A	new relief requests	RP-23B, RV-07A (Rev. 5), and RV-07C (Rev. 5).
B	revised relief requests	RP-00A Addendum, RV-00D, RV-00E, RV-00F, and RV-30A.
C	renumbered relief requests	RP-00A Addendum to RP-23A, RV-00D to RV-02A, RV-00E to RV-00A, RV-00F to RV-00B.
D	relief requests rewritten as refuel justification or technical approach	RV-00A, RV-00B, RV-00C (Rev. 4), RV-02A (Rev. 4), RV-07A (Rev. 4), RV-11A, RV-13A, RV-16A, RV-23A, RV-24A, RV-25A, RV-30C, RV-30D, RV-30E, RV-32A, RV-37A, RV-43A, RV-46A, RV-46B, RV-47A, and RV-47B.
	relief requests that are rewritten as described above and cease to be relief requests	RV-00C (Rev. 4), RV-02A (Rev. 4), RV-07A (Rev. 4), RV-11A, RV-13A, RV-16A, RV-23A, RV-24A, RV-25A, RV-30C, RV-30D, RV-30E, RV-32A, RV-37A, RV-43A, RV-46A, RV-46B, RV-47A, and RV-47B.
	relief requests rewritten as described above, but replaced by another relief request	RV-00A, RV-00B, RV-00C, RV-02A, and RV-07A.
E	relief requests specifically deleted	RP-00A, RP-00B, RP-11A, RP-52A, and RV-00G.
F	No change made to the relief request	RV-03A, RV-30B, and RV-52A.

*The following aspects of how the licensee has identified relief requests in the IST program should be understood:

- (1) Certain relief requests for valves were rewritten for the IST program and ceased to be relief requests; however, they were then replaced by new or renumbered requests for relief and are identified in Section 3.7 of the IST program as valve relief requests.
- (2) Certain relief requests for valves were identified with revision numbers in Section 2 of the executive summary of the IST program describing changes to the relief requests, but were not identified by the revision number in Section 3.7 of the IST program, which lists the valve relief requests for the IST program.

TABLE 2 EVALUATION OF LICENSEE'S RESPONSE TO THE IST PROGRAM ANOMALIES

Anomaly	Relief Request	Description of Issue	Licensee Response	NRC Conclusion
1		The licensee was requested to include information on how IST components were selected and how testing requirements were identified for each component.	The requested information is provided in Section 1.2 of the revised IST program.	Licensee's response is appropriate. No further NRC action is required.
2	RV-00A, -00C, -00E, -00F, and -03A.	The licensee indicated compliance with GL 89-04, but did not specifically address all aspects of the GL. The licensee was informed that relief request must be submitted for any deviations from GL 89-04 positions for these relief requests.	RV-00A and -00C were deleted; RV-00B was rewritten as a refuel justification; RV-00E and RV-00F were updated and renumbered as RV-00A and RV-00B, respectively; and RV-03A remains unchanged.	Supporting documentation should be available during NRC inspections for relief requests which comply with GL 89-04 Positions.
3	RV-00E and -00F	The licensee should consider non-intrusive techniques (NIT) to verify the full-stroke capability of the check valves in question.	The licensee stated that non-intrusive methods have been explored and are currently being qualified and implemented.	Investigation of NIT should continue and the relief requests should be deleted or revised if IST requirements can be met.

Table 2 Continued

Anomaly	Relief Request	Description of Issue	Licensee Response	NRC Conclusion
4	RV-00G	Regarding plant startup with inoperable valves, the Technical Specifications (TS) must specifically permit plant startup with the valve inoperable. Additionally, if corrective action for a valve is deferred under this relief request, the valve should be repaired or replaced and successfully tested prior to entering an operating mode where the valve is required to be operable.	The licensee deleted this relief request.	No further NRC action is required.
5	CS-23B	The licensee should resolve the inconsistencies in the numbering of valves in this request and the P&IDs for Units 1 and 2.	The licensee deleted this cold shutdown justification and updated the P&IDs.	No further NRC action is required.
6		The licensee should correct the conflict in the IST interval start dates specified in the cover letter and the IST program.	This has been corrected in the revised IST program.	No further NRC action is required.
7	CS-23B	This cold shutdown justification is based on argument that quarterly testing would be a hardship without a compensating increase in the level of quality. It should be withdrawn or be modified to adequately demonstrate the impracticality of exercising these valves quarterly.	The licensee withdrew this cold shutdown justification.	No further NRC action is required.

Table 2 Continued

Anomaly	Relief Request	Description of Issue	Licensee Response	NRC Conclusion
8		The licensee should review the safety function of check valves (0203-3AD, 0220-81A to -81E, and 0220-105A to -105E) to determine if they should be included in the IST program.	These valves have been included in the IST program.	No further NRC action is required.