ENCLOSURE

STAFF EVALUATION REGARDING TESTING

OF NORMALLY CLOSED CHECK VALVES

FOR CLOSURE CAPABILITY

Reference: November 8, 1983 memorandum from R. L. Spessard, Region III, to Darrell G. Eisenhut, NRR

The referenced memorandum states that there is no apparent requirement in Section XI of the ASME Code to verify closure of normally closed check valves that are classified Category C in accordance with Subsection IWV of the code. It correctly points out that there are normally closed check valves, other than Containment Isolation Valves (CIVs) and Pressure Isolation Valves (PIVs), that have a safety related function in the closed position. An example of such valves is given for the Callaway plant and stated to be a normally closed ECCS suction line check valve between the Refueling Water Storage Tank and the ECCS pumps.

It is stated that verification of the closure function of normally closed check valves is a generic safety concern to the extent that surveillance is never done after construction to verify the closure function. Specifically, the staff position was requested regarding:

1) Testing of normally closed check valves for closure capability during preoperational testing.

2) Testing of normally closed valves for closure capability during plant life.

In response, the staff position is, and has been, that normally closed check valves, that have a safety function in the closed position, other than CIVs and PIVs, should have the closure function verified both during preoperational testing and periodically throughout the plant life. In the staff's normal review of IST programs whenever a valve of this type is identified, the staff verifies that closure verification testing is specified in the IST program, and if not, the staff either requires that the program be revised to so specify or the staff specifies in the IST SER that closure testing must be performed.

Even though that is the position that the staff has been implementing, the staff does believe that there is some ambiguity within ASME Section XI regarding closure verification testing of normally closed check valves. Check valve testing is specified in paragraph IWV-3520 of the 1983 Edition of Section XI. Paragraph IWV-3522 "Exercising Procedure" requires that check valves be periodically exercised to the position required to fulfill their function. Testing intervals required vary from a minimum of every three months to each Cold Shutdown. (Earlier Section XI editions are essentially the same.)

The Code ambiguity arises from the fact that paragraph IWV-3522(b) "Normally Closed Valves" discusses in detail the performance of tests for periodic verification of the valve opening function but does not specifically mention periodic closure verification tests.

In an attempt to have ASME clarify the ambiguity in the Code paragraphs, the staff submitted a related inquiry to the society. The response to the inquiry, recently received, unfortunately was inconclusive. The staff inquiry was written in broad terms to cover both check and gate valves used in applications where the valve disk in the closed position was essential to the fullfillment of the valve's safety related function. The inquiry asked whether such valves should be categorized as A or AC and leak tested in accordance with paragraph IWV-3420.

If the ASME response was "no" to the A or AC categorization and leak tests, it was hoped that the reply would at least confirm that the intent of IWV-3522 for check valves and IWV-3412 for gate valves was that some kind of closure verification test was to be performed. Unfortunately the response that was received is concentrated on the categorization aspect of the inquiry and simply states that categorization is the Owner's (licensee's) responsibility.

Nevertheless, the staff personnel that participate in ASME Section XI standards writing activities were present at some of the meetings when the inquiry was discussed. The impression received at the meetings was that the intent of the Code for both check valves and gate valves was that periodic verification of closure function is required for valves, whether normally open or closed, if they perform a safety function in the closed position. Verification would also be required during preoperational testing by paragraph IWV-3100 "Pre-service Tests" which requires that all tests to be performed periodically during plant life per IWV-3000 also be performed after installation and prior to service.

One additional item that supports the requirement for periodic closure verification testing is that the latest draft of ANSI/ASME OM-10 "Inservice Testing of Valves" specifically requires that check valves be exercised or examined in a manner which verifies obturator travel to the closed, full open, or partially open position required to fulfill its function. ANSI/ASME OM-10 is generally expected to be an eventual replacement for subsection IWV of ASME Section XI.

In summary, the staff position is that normally closed check valves that have a safety related function in the closed position should be tested for closure capability during preoperational testing and periodically during plant life in accordance with the intervals specified in IWV-3520.

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

APR 11 1985

Docket No.: 50-341

MEMORANDUM FOR: Richard L. Spessard, Director
Division of Reactor Safety
Region III

FROM: Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation

SUBJECT: RESPONSE TO REQUEST FOR TECHNICAL ASSISTANCE REGARDING MAXIMUM STROKE TIME TESTING FOR IST OF VALVES

We have reviewed the information submitted in your request for technical assistance dated November 14, 1984 regarding testing of the maximum stroke time as part of the in-service testing (IST) program at the Fermi-2 facility. Our basic position on this request is that the applicant has committed to comply with the requirements of the ASME Code and has not requested specific relief from the applicable portion of the ASME Code. Our response is directed towards the third concern outlined in your letter (i.e., the acceptability of baseline data established for valve testing in accordance with Section XI of the ASME Code) since the first two concerns were previously resolved.

Acceptability of Baseline Data Established for Valve Testing per Section XI

With respect to the applicant's procedures for measuring valve stroke times, as described in your letter dated November 14, 1984, the staff agrees that these procedures are not in accordance with the requirements of Section XI, Subsection IWV-3417 of the ASME Code (the Code). The use of such procedures would require prior written relief by the staff from the specific requirements of the Code.

The specific applicable Code requirements are:

IWV-3417 Corrective Action

(a) If, for power operated valves, an increase in stroke time of 25% or more from the previous test for valves with full-stroke times greater than 10 sec or 50% or more for valves with full-stroke times less than or equal to 10 sec is observed, test frequency shall be increased to once each month until corrective action is taken, at which time the original test frequency shall be resumed. In any case, any abnormality or erratic action shall be reported. (Emphasis added).

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Contact: M. Lynch, 492-7050

(b) If a valve fails to exhibit the required change of valve stem or disk position or exceeds its specified limiting value of full-stroke time by this testing, then corrective action shall be initiated immediately. If the condition is not, or cannot be, corrected within 24 hours, the valve shall be declared inoperative. When corrective action is required as a result of tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable operation shall be run following any required corrective action before the valve is returned to service.

As cited above, each in-service test valve stroke time is required to be compared to the previous in-service test valve stroke time and is not related in any way to the design or purchase specification for a valve. Additionally, the staff does not interpret a corrective action to be the acceptance of the new stroke time measured on the first monthly test. When a valve has exceeded this criterion on one in-service test, the monthly frequency must be maintained until maintenance is performed on the valve so that it will not become inoperable.

It appears that the applicant's practice for establishing maximum limiting stroke times for valves is also inconsistent with the staff's interpretation of the Code. Subsection IWV is specifically a "component" test code and, therefore, requires that the owner specify the maximum limiting stroke times for each power operated valve (IWV-3413). It is the staff's position that these limiting values of full stroke time are required to be based on reasonable engineering judgement of component (valve) operability, not minimum system requirements. System (or component) response time limitations, as stated in the applicant's FSAR or in the plant Technical Specifications, are also time limitations placed on each subcomponent of that system (or component). However, the staff's position is that these response time limitations should rarely take precedence over a component-oriented limiting valve stroke time.

Inasmuch as the IST program requirements become applicable when Detroit Edison declares that the Fermi-2 facility has gone "commercial," you should bring this matter to its attention so that it can be properly resolved.

Frank J. Miraglia

Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation

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

October 19, 1984

MEMORANDUM FOR: R. L. Spessard, Director
Division of Reactor Safety, Region III

FROM: Darrell G. Eisenhut, Director
Division of Licensing, NRR

SUBJECT: RELIEF REQUESTS FROM LEAK TESTING REQUIREMENTS AS STATED IN SECTION XI, SUBSECTION IWV-3420 OF THE ASME CODE
TIA 84-62

REFERENCE: R. L. Spessard memorandum to D. G. Eisenhut dated July 19, 1984; Request for Technical Assistance - Relief Requests from Leak Testing Requirements as stated in Section XI, Subsection IWV-3420 of the ASME Code (AITS F03043684)

Your July 19, 1984 memo noted that the Commission has granted relief from leak rate testing requirements of IWV-3420 for containment isolation valves and permitted 10 CFR Part 50, Appendix J, type C testing as an alternative. This practice has led to two questions:

1. Does granting such relief exempt licensees from specifying discreet or weighted leak rates for Category A valves addressed by the relief request?

2. Does granting such relief exempt licensees from leak rate analysis and corrective action requirements as stated in IWV-3426 and 3427, respectively as well as those requirements stated in IWV-3420 through IWV-3425?

As requested, we have reviewed the questions and the implications of the granting of exemptions from Section XI, IWV-3420 of the ASME Code. Section XI of the ASME Code requires individual testing for each component in the IST program, including individual acceptance criteria. Containment Isolation Valves (CIVs) are required to be individually included in the IST program because of their accident mitigation service requirements. However, since licensees are required to perform leak rate testing of CIVs in accordance with 10 CFR Part 50, Appendix J, NRR has routinely granted relief from the leak rate test requirements of the ASME Code for these components. For cases where this relief is granted the staff requires that the licensee still meet the Analysis of Leak Rates and Corrective Action requirements of the Code, paragraphs IWV-3426 and IWV-3427 of the 1980 Edition, respectively.

The staff believes that a "weighted" approach is the most appropriate method of assigning allowable leak rates. This method is based on the existence of a linear relationship between valve sizes with respect to allowable leakage (i.e., a 6" valve would be allowed twice the leakage of a 3" valve). Additionally, when the allowable leak rates are added up for all type C tested CIVs, the total should not exceed 0.6 L_A. This allows a certain amount of

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flexibility since the $0.6L_A$ value specified by Appendix J is the maximum allowed for the combined cumulative leak rates of type C tested CIVs and containment penetrations as determined by type B testing.

This completes NRR review pursuant to TIA 84-62.

Frank J. Miraglia for

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

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SSINS 6025

MEMORANDUM FOR: S. E. Bryan, Division of Reactor Operations Inspection, Office of Inspection and Enforcement

FROM: R. C. Lewis, Acting Chief, Reactor Operations and Nuclear Support Branch, Region II

SUBJECT: OPERABILITY REQUIREMENTS (AITS No. F02700028)

A concern was recently identified involving the starting point for time periods in Technical Specification ACTION statements when equipment has been declared inoperable under the ASME Section XI testing program.

ASME Section XI, IWP-3220, states "All test data shall be analyzed within 96 hours after completion of a test". IWP-3230(c) states, in part, "If the deviations fall within the 'Required Action Range' of Table IWP-3100-2, the pump shall be declared inoperative, ..."

In most cases equipment covered by ASME Section XI, IWP, is also covered by Technical Specifications and, if declared inoperable, would result in the plant entering an ACTION statement. These ACTION statements generally have a time period after which, if the equipment is still inoperable, the plant must perform some specific action (shutdown, cool down, etc.).

The concern arises in the area of the aforementioned data analysis interval versus the Technical Specification ACTION statement time period. It is questionable whether or not these periods run consecutively, concurrently or otherwise. The enclosed scenario's detail likely plant events and are indicative of actual experience.

Region II believes that a reasonable time for data analysis is not more than two shifts (16 hours) except in extreme circumstances. The Technical Specification ACTION time should start immediately after the data has been reviewed by the cognizant supervisor (shift supervisor, foreman, etc.). Licensee procedures must require prompt review by the cognizant supervisor when test results fall outside acceptance criteria.

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We do not believe that ASME Section XI statement on evaluation of test data relieves the licensee of action statements in Technical Specifications. We request that this matter be reviewed and our understanding be confirmed or guidance issued to provide uniformity.

H C Dance /for

R. C. Lewis, Acting Chief
Reactor Operations and Nuclear
Support Branch

Enclosure: Field Experience Regarding
Equipment Operability

ENCLOSURE

FIELD EXPERIENCES REGARDING EQUIPMENT OPERABILITY

1. A Section XI test is run on an engineered safety feature pump on Saturday morning and the data fall on the lowest limit of the "Required Action Range" just above the "Alert Range". The plant Performance Engineer, who performs the data review and would be the individual to declare the pump inoperative, is not on site until Monday morning when the data set is reviewed.

   On Monday, the Performance Engineer reviews the data and declares the pump inoperable per the Technical Specifications and thus "starts the clock" on the ACTION statement time period.

   Most Licensees would view this as acceptable due to the 96-hour statement included in IWP.

2. A safety-related pump is tested and the data fall within the "Required Action Range." The Performance Engineer orders that the instruments be recalibrated (24-36 hours) and the test re-run as allowed by IWP-3230(b). The test is re-run and the data are still in the "Required Action Range". The Performance Engineer declares the pump inoperable and "starts the clock".

   This might be done in order to extend operation until a scheduled outage.

3. A safety-related pump is tested and the shift supervisor notes that the data appears to fall into the "Required Action Range"; however, he feels it should be further analyzed. The data are transmitted to the Performance Engineer who waits 2-3 days to make his analysis and then declares the pump inoperable thus "starting the clock" (at this point he could also request the test be re-run, adding more time to the cycle).

   This also might be done to extend operations until a scheduled outage or to delay plant shutdown until the weekend.