

# NRC INSPECTION MANUAL

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## PART 9900: TECHNICAL GUIDANCE

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AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
ASME, SECTION XI

### A. PURPOSE

To provide guidance on testing normally closed check valves specified in paragraph IWV-3520 of the ASME Code Section XI, 1983 Edition, as provided by an NRR memorandum dated April 18, 1985.

### B. BACKGROUND

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 according to Subsection IWV. The majority of safety-related check valves are Category C valves. During evaluations of licensing actions related to pump and valve inservice inspection (ISI) programs, it was generally found that periodic closure testing is done only for containment isolation check valves and check valves that protect low pressure systems outside containment from reactor pressure. Consequently, Category C check valves could in many cases have the valve internals entirely missing and yet pass all preoperational and periodic tests now normally done.

In response to a Region III request, NRR has provided the following guidance concerning check valve testing.

### C. DISCUSSION

Region III made a statement to NRR that verification of the closure function of normally closed check valves is a generic safety concern to the extent that surveillance testing is usually not performed after plant construction to reverify the closure function. Guidance was requested for testing of normally closed check valves for (1) closure capability during preoperational testing and (2) closure capability during plant life.

The NRR position was that normally closed check valves, that have a safety function in the closed position, other than containment isolation valves (CIVs) and pressure isolation valves (PIVs), should have the closure function verified both during preoperational

testing and periodically throughout the plant life. In NRR's normal review of the inservice testing (IST) programs, whenever a valve of this type is identified, NRR verifies that closure verification testing is specified in the IST program, and if not, NRR either requires that the program

be revised to so specify or NRR specifies in the IST SER that closure testing must be performed.

Even though that is the position that NRR has been implementing, NRR 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 editions of Section XI 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, NRR submitted a related inquiry to the ASME society; however, the response to the inquiry was inconclusive. The NRR 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 fulfillment 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 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. However, the response that was received concentrated on the categorization aspect of the inquiry and simply stated that categorization is the Owner's (licensee's) responsibility.

Nevertheless, NRR 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 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 also would be required during preoperational testing by paragraph IWV-3100, "Preservice 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, fully open, or partially open position required to fulfill its function. ANSI/ASME OM-10 is expected to be an eventual replacement for subsection IWV of ASME Section XI.

#### D. CONCLUSION

The NRR position is that normally closed check valves, that have a safety function in the closed position, should have the closure function verified both during preoperational testing and periodically throughout the plant life.

#### E. REFERENCE

The guidance provided in this directive was extracted from a memorandum from Hugh L. Thompson, Jr., Director, Division of Licensing, NRR, for Richard L. Spessard, Director, Division of Reactor Safety, Region III, dated April 18, 1985, subject: Closure Verification of Normally Closed Check Valves During Preoperational Testing at Callaway (TIA 83-117). The complete memorandum is in the Document Control System (DCS microfiche #67820-200).

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