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July 27, 1981

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Director of Nuclear Reactor Regulation
ATTN: Mr. J. F. Stolz
Operating Reactors Branch #4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Request for Additional Information
Related to the Inservice Testing of Valves
(File: 1511.1)

Gentlemen:

In response to your letter dated April 22, 1981, we are submitting the additional information and proposed modifications. You will find these items attached.

Sincerely,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:MCS:nak

Attachments

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SUBMITTAL OF ADDITIONAL INFORMATION
RELATED TO THE INSERVICE TESTING OF VALVES
FOR
ARKANSAS NUCLEAR ONE, UNIT NO. 1
DOCKET NO. 50-313

Item 1

Testing of valves which perform a pressure isolation function.

Request

There are several safety systems connected to the reactor coolant pressure boundary that have design pressures that are below the reactor coolant system operation pressure. There are redundant isolation valves within the Class 1 boundary, forming the interface between the high and low pressure systems to prevent the low pressure systems from being subjected to pressures which exceed their design limit. In this role, the valves are performing a pressure isolation function.

It is our view that the redundant isolation provided by these valves regarding their pressure isolation function is important to safety. We consider it necessary to provide assurance that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. For this reason we believe that some method, such as pressure monitoring, radiography, ultrasonic testing, or leak testing, should be used to assure that the condition of each valve is satisfactory to maintain this pressure isolation function.

We have identified the following valves as pressure isolation valves:

a) CF-1A, 1B (M-230, RCS/CFT)

b) DH-14A, 14B (M-230, RCS/L.P. Injection)

c) DH-13A, 13B (M-230, RCS/L.P. Injection)

d) MU-34A, B, C (M-230, RCS/H.P. Injection)

e) DH-17 (M-230, RCS/L.P.)

f) DH-18 (M-230, RCS/L.P. Injection)

g) CV-1228, 1227 (M-231, RCS/H.P. Injection)

h) CV-1219, 1220 (M-231, RCS/H.P. Injection)

i) CV-1050 (M-230, RCS/DHR)

j) CV-1410 (M232, RCS/CHR)

k) DH-12, 16 (M-230, RCS/DHR)

We request that you propose a method to assure that each of the above valves will maintain the pressure isolation function and modify your IST programs accordingly. We request that you provide us an evaluation on a valve-by-valve bases of the details of the methods used to clearly demonstrate the conditions of each valve.

In the event that leak testing is selected as the appropriate procedure for achieving this objective we believe that the valves should be categorized as A or AC and leak tested in accordance with IWV-3420 of Section XI of the applicable edition of the ASME Code.

We also request your proposed schedule for testing each valve and modify your IST program accordingly.

RESPONSE

Each valve shall be listed separately along with the information requested.

a) CF-1A, 1B

These valves are reclassified as Category AC valves and will be leak tested per Procedure 1102.01, Attachment I, in accordance with the ASME Code, Section XI, Subsection IWV, Article 3420.

b) DH-14A, 14B

These valves are reclassified as Category AC valves and will be leak tested per Procedure 1102.01, Attachment I, in accordance with the ASME Code, Section XI, Subsection IWV, Article 3420.

c) DH-13A, 13B

These valves are reclassified as Category AC valves and will be leak tested per Procedure 1102.01, Attachment I, in accordance with the ASME Code, Section XI, Subsection IWV, Article 3420.

d) MU-34 A, B, C, D

We are proposing to install a pressure gauge at pressure points PP-1210 and PP-1227. These will be used to monitor the pressure in the High Pressure Safety Injection system upstream of Valves CV-1219, CV-1220, CV-1227, and CV-1228, which will be reclassified as Cat. AB valves. These are motor operated valves within piping rated at RCS pressure and are normally closed. Portions of this system are either at Makeup System pressure or idle Decay Heat suction pressure depending upon which Makeup Pump is in operation, which one is in Makeup System standby, and which one is in standby. Three check valves, MU-19 A, B, C, serve as backup pressure boundary isolation valves. All piping on the discharge side of the Makeup Pumps is rated for RCS pressures. Leakage past these valves will be monitored with Pressure Indicators PI-1241, PI-1243. These are on the Makeup Pump discharge and will

indicate Decay Heat suction pressure on the idle pumps. Pump usage is rotated three times during each month. This would enable us to monitor any leakage past MU-19 A, B, and C within the frequency limits outlined in the ASME Code, Section XI, Subsection IWV, Article 3420. These valves will be reclassified as CAT. AC Valves.

Because of this, we do not consider MU-34 A, B, C, and D valves as boundary isolation valves.

e) DH-17

This valve will be reclassified as a Category AC Valve and will be leak tested per Procedure 1102.01, Attachment I, in accordance with the ASME Code, Section XI, Subsection IWV, Article 3420.

f) DH-18

This valve will be reclassified as a Category AC Valve and will be leak tested per Procedure 1102.01, Attachment I, in accordance with the ASME Code, Section XI, Subsection IWV, Article 3420.

g) CV-1228, 1227
See response 1d

h) CV-1219, 1220
See response 1d

i) CV-1050

We are proposing to add a pressure transmitter at Pressure Point PP-1410 which will display a reading outside the Reactor Building.

This will be used to monitor any leakage past CV-1410 and CV-1050. The pressure during normal operation should be equal to Decay Heat system pressure. This modification will be performed during the next refueling outage in order to accommodate the ALARA guidelines. This valve will be classified as Cat. AB.

j) CV-1410

We are proposing to monitor this valve for leakage during Cold Shutdown mode before placing the Decay Heat System into service. Valve CV-1410 will be leak checked by opening CV-1050 and monitoring the pressure at pressure point DH-1024, where a pressure transmitter will be installed which will display a reading outside the Reactor Building. This modification will be performed during the next refueling outage in order to accommodate the ALARA guidelines. This valve will be classified as Cat. AB.

k) DH-12, 16

DH-19 and DH-15 are located upstream of these valves. They are connected to piping rated for RCS pressure and provide the necessary pressure boundary isolation function. Since they are locked closed during normal operation, they are classified as Category E Valves and are not subject to testing per the ASME Code Section XI, Subsection IWV criteria.

For this reason, we do not consider DH-12, 16 as pressure boundary isolation valves.

Item 2

Changes to the Technical Specification

Request

In a November 1976 letter to the licensee, we provided an attachment entitled "NRC Guidelines for Excluding Exercising (Cycle) Tests of Certain Valves During Plant Operation." The attachment stated that when one train of a redundant system such as in the Emergency Core Cooling System (ECCS) is inoperable, nonredundant valves in the remaining train should not be cycled if their failure would cause a loss of total system function. For example, during power operation in some plants, there are stated minimum requirements for systems which allow certain limiting conditions for operation to exist at any one time and if the system is not restored to meet the requirements within the time period specified in a plant's Technical Specifications (T.S.), the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For such plants this situation could be contrary to the NRC guideline as stated in the document mentioned above.

We acknowledge receipt of your letter dated October 19, 1977 which proposed Technical specifications (TSs) changes that would incorporate provisions of compliance with 10CFR50.55a. However, it does not appear that those proposed TSs accommodate our guidelines for including exercising tests of certain valves during plant operation.

We request that you review the current Technical Specifications (TS) and your proposed TS for ANO-1 and consider the need to propose TS changes which would have the effect of precluding such testing.

After making this review, if you determine that the TS should be changed because the guidelines are applicable, we request you submit proposed TS changes and describe the inoperable condition for each system that is affected which demonstrates that the valve's failure would cause a loss of system function. Conversely, if you determined that the TS should not be changed because the guidelines are not applicable or cannot be followed, we request you submit the reasons which led you to this determination for each potentially affected section of the TS.

Response

We have, in conjunction with operations, reviewed the current Technical Specifications and our proposed TS for ANO-1 and 2 in respect to "NRC Guidelines for Excluding Exercising (cycle) Tests of Certain Valves During Plant Operation." We have determined that the TS should not be changed as they meet the guidelines.

Item 3

Valve Testing at Cold Shutdown

Request

Your proposed IST program does not discuss valve testing at cold shutdown. Our position on this issue is as follows:

Inservice valve testing at cold shutdown is acceptable when the following conditions are met: It is understood that the licensee is to commence testing within two hours after the cold shutdown condition is achieved but not later than 48 hours after shutdown and continue until complete or plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during any subsequent cold shutdowns that may occur before refueling to meet the Code Specified testing frequency.

For planned cold shutdowns, where the licensee will complete all the valves identified in his IST program for testing in the cold shutdown mode, exception to the above 48 hour start time may be taken.

We request that you submit within 90 days from receipt of this letter a modification to your proposed IST program which would include our position on valve testing at cold shutdown.

Response

We are acknowledging your position on valve testing at Cold Shutdown and will modify our Inservice Testing Program as follows:

> Valve testing in accordance with the ASME Code, Section XI, shall commence within two hours after a Cold Shutdown condition is achieved but not later than 48 hours after shutdown and continue until complete or the plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one Cold Shutdown will be performed during any subsequent Cold Shutdowns that may occur before refueling to meet the Code specified testing frequency.
>
> Exceptions to the 48 hour start time will be taken for planned Cold Shutdowns where all valve testing in Cold Shutdown mode identified in our Inservice testing Program will be completed.

Item 4

Relief Requests

Request

A. Reactor Coolant System

Category C Valves, Valves CF-1A & CF-1B

Subsection IWV-3520(a) of the Section XI Code requires these valves to be fully stoke exercised once every three months with exceptions as defined in IWV-3520(b). In the case of exceptions for a check valve the code permits the valves to be tested at cold shutdown where it is not practical to exercise the valves during power operation.

You have proposed to part stoke these valves at each refueling outage and request relief from code requirements.

Basis For Request For Relief From Code Requirements

CF-1A and CF-1B cannot be full or part stroke exercised every three months while the plant is in power operation. These check valves are not designed to be manually stroked, and can only be exercised by flow. Flowing during normal operation from the CFTs is not possible due to the fact that the differential pressure between the RCS (approximately 2250 psig) and the CFTs (approximately 600 psig) acts to maintain check valves DH-14A and DH-14B closed. These check valves are in series with CF-1A and CF-1B respectively, therefore preventing flow thru CF-1A and CF-1B from the CFTs.

Full stroking of these valves during cold shutdown could subject the reactor coolant system to conditions exceeding pressure temperature limits and create as much as 28,000 gallons of liquid waste.

Evaluation

The Core Flood Discharge check valves CF-1A and CF-1B are valves that form part of a redundancy with check valves DH-14A and DH-14B respectively, whose function is to isolate the lower design pressure Core Flooding Tank (CFTs) from the higher operating pressure Reactor Coolant System (RCS) during power plant operation. These valves automatically open during a large-break LOCA when the (RCS) pressure drops below approximately 600 psig and allows water from the CFTs to flood the reactor core.

Conclusion

We agree with you that the testing frequency required by code to be impractical. Also we agree with you that full stroke exercising these valves during operation or at cold shutdown is not possible with the present plant configuration. Therefore, we request you submit within 90 days from receipt of this letter supporting analyses which would justify granting of relief or propose modifications which would not require the granting of relief.

We consider the methods discussed in Appendix 1 acceptable for resolving this issue.

B. Reactor Building Spray System

Category C Valves, BS-4A &-4B

Subsection IWV-3520(a) of Section XI Code requires these check valves to be fully stroke exercised once every three months with exceptions as defined in IWV-3520(b). In the case of exceptions for these valves the code permits the valves be tested at cold shutdown where it is not practical to test the valves during power operation.

You have proposed not to test these valves at any time and you have requested relief from the code requirements.

Basis for Request for Relief From Code Requirement

These valves are upstream of the reactor building spray nozzles. Water cannot be used for stroking check valves because the system is open ended into the containment. Alternate test procedures require more manpower and equipment than is normally available during cold shutdown.

Evaluation

These valves are check valves in the redundant reactor building spray line inside the containment. Their functions are to isolate the containment from the environment and to open in the event the reactor building spray system is called upon to function. Our main concern is that they will not open and allow flow from the spray pumps.

Conclusion

We would agree that the testing frequency required by the code to be impractical. Also we would agree that full stroke exercising these valves during operation or at cold shutdown is not possible with the present plant configuration. Therefore, we request within 90 days from receipt of this letter that you submit supporting analyses which would justify granting of relief or propose modifications which would not require the granting of relief.

We consider the methods discussed in Appendix 1 acceptable for resolving this issue.

Response

A. Reactor Coolant System

Category AC Valves, CF-1A, 1B

Relief Request

We are requesting relief from the ASME Code, Section XI requirement to fully stroke exercise these valves every three months. The Code allows for exceptions by permitting the valves to be tested during Cold Shutdown.

We are proposing to part stoke these valves at each refueling outage and request relief from the Code testing requirements.

Basis For Request For Relief

These check valves are only exercised by flow from the Core Flood Tanks (CFT) and are not designed to be manually operated.

During normal operation flow from the CFT's is prevented by the check valves DH-14A and 14B, which are in series with CF-1A and 1B. These valves are kept closed by the differential pressure between the RCS (about 2250 psig) and the CFT's (about 600 psig).

Full stroking of these valves during Cold Shutdown could subject the Reactor Coolant System to conditions exceeding pressure and temperature limits and create as much as 28,000 gallons of liquid waste.

Additional Information

As additional basis for our request for relief, we are submitting a reliability analysis that was performed on the subject valves.

B. Reactor Building Spray System

Category AC Valves, BS-4A and BS-4B

Relief Request

The ASME Code, Section XI, Subsection IWV, Article 3520(a) requires these valves to be fully stoke exercised every three months. The code allows for exceptions by permitting the valves to be tested at every Cold Shutdown where it is not practical to test the valves during power operations. We are proposing not to test these valves at any time and request relief from the code requirements.

Basis For Request For Relief

These valves are upstream of the Reactor Building spray nozzles. Water cannot be used for stroking the check valves because the system is open ended into the Containment Building. Alternate test procedures require more manpower and equipment than is normally available during Cold Shutdown.

Additional Information

As additional basis for our request for relief, we are submitting a reliability analysis that was performed on the subject valves.

Item 5

IST program for Reactor Vessel Internal Check Valves.

Request

We discussed this matter with your staff on November 24, 1980, and they agreed to submit the IST program for the reactor vessel internal check valves. We request revised pages to your IST program which includes these valves within 90 days from receipt of this letter.

Response

The revised page to our Inservice Testing Procedure is being submitted to show inclusion of the Reactor Vessel Internal Check Valves.