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May 6, 1980

1-050-04

Director of Nuclear Reactor Regulation
ATTN: Mr. R. W. Reid, Chief
Operating Reactors Branch #4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Inservice Testing Program
(File: 1510, 3065)

Gentlemen:

Our submittal of January 15, 1979 was made to resolve any items left open from a meeting held at Arkansas Nuclear One (ANO) with your staff on November 15 and 16, 1978. Your letter of June 29, 1979 was a request for additional information. This information was provided to your staff in a telecon held in September of 1979. Attached is the subject information.

Very truly yours,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:MAS:skm

Attachment

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

ARKANSAS NUCLEAR ONE - UNIT 1 INSERVICE TESTING PROGRAM

Subject:

These questions are the result of the Brookhaven National Laboratory review of the Arkansas Nuclear One - Unit 1 (Docket 50-313) Inservice Testing Program Resubmittal (1-019-6) dated January 15, 1979.

References:

A. BNL-NUREG-25496, "Recommendations to the Staff on Arkansas Nuclear One - Unit 1 Inservice Testing Program", December 1978.

   Note: This is the BNL report to the NRC that resulted from the IST program SER meeting held at the plant on November 15 and 16, 1978.

B. Arkansas Nuclear One - Unit 1 Inservice Testing Program Resubmittal (1-091-6) dated January 15, 1979.

C. Arkansas Nuclear One - Unit 1 Inservice Testing Program (pumps and valves) submittal 1005.08 dated June 18, 1977 (20-month period starting April 1978).

Question 1.0 CF-1A and CF-1B:

Reference B (Item 3.0) stated that the subject check valves shall be partial-stroke exercised during each refueling outage.

Reference B (Item 3.0) also stated that "full-stroking of these valves during cold shutdown could delay startup more than 8 hours and create as much as 28,000 gallons of liquid waste." While this provided a basis for not full-stroking at cold shutdown, it did not provide the information required in Reference A (Item 2.2.5.1, Evaluation),i.e. to provide information that would indicate the degree of part-stroking obtainable and provide technical justification as to why full-stroking is not practical at refuelings or some time during service life.

Provide information concerning the degree of part-stroking expected during tests; such as a percentage of design flow rate obtained or some other measure. The licensee should also give specific reasons why full-stroking these valves cannot be accomplished at refueling intervals or at some time during service life. (What are the problems involved?)

Response 1.0:

Before each refueling, during RCS depressurization, the MOV's isolating the core-flood tanks are not closed until a level decrease in the CFT's is observed. This indicates a flow from the CFT's to the RCS and a partial stroke of these check valves. The flow rate through the check valves is not constant during the test so no information that would indicate the degree of part-stroking is obtained.

The force of water entering the reactor vessel at full flow at any time during the service life of ANO-1 might be sufficient to damage or weaken internal components. For this reason, full-stroking these valves is impractical.

Question 2.0 MU-34D:

During discussions at the SER meeting (Reference A, Item 2.2.6, Evaluation), this check valve was determined to be in the normal make-up path to the RCS. The problem with full-stroking was understood to be that flows up to 250 GPM would be required via the make-up pumps and would exceed letdown flow, possibly leading to a high pressurizer level reactor trip. Reference B indicates that full-stroke exercising this valve during normal plant operation would thermally shock the HPI nozzle.

It was our understanding from the SER meeting that the MU-34D path was the make-up path and that thermal shock of this nozzle was not a problem. Review the reasons cited above and confirm for the sake of consistency which one is to be used as the basis for relief.

Response 2.0:

Reference A was correct. This check valve is in the normal make-up path to the RCS and full-stroking would require flow rates up to 250 GPM. This flow rate would exceed letdown flow, and possibly lead to a reactor trip on high pressurizer level.

Question 3.0 CV-1214, CV-1216 and CV-1221:

The explanation given in Reference B appears to be different from the evaluation written in Reference A (Item 2.4.3.1, Evaluation). Reference B states that "failure of valves in closed position would require stopping RC pump seal injection and the RC pumps. Reference A indicates the problem could be high level pressurizer trip. This should be clarified for the sake of consistency.

Response 3.0:

Reference A was correct.

Question 4.0 CV-1050:

Reference B shows the valve deleted from the program. Reference A (Item 2.2.3 and 2.2.6.2) shows the valve as being in the program as Category B. The valve is a Pressure Isolation candidate and was questioned as to possibly performing a containment isolation function. The following information is required before we can evaluate whether or not this valve is to remain in the IST program: Is the valve a containment isolation valve? Does it receive a C.I. signal?

Response 4.0

CV-1050 is not a containment isolation valve and does not receive a containment isolation signal.

Question 5.0 CV-1300 and CV-1301:

These valves were listed in Reference C as Category B. Reference B lists these valves as Category A. Which is correct? If these valves are Category A, satisfy all the requirements of IWV-3420 or request relief from this paragraph.

Response 5.0:

Reference C was correct. These valves are Category B.

Question 6.0 CV-1234:

Based on discussions at the SER meeting, Reference A (Item 2.4.4.1) states that the valve would be exercised at cold shutdown. Reference B states that the valve will be exercised every 3 months to Code. Please confirm which is correct.

Response 6.0:

Reference A was correct. The valve will be exercised at cold shutdown.

Question 7.0 CV-1220:

Reference A (Item 2.4.5.1) indicates the reason for stroking this valve at cold shutdown was that make-up flow disruption would occur if the valve was exercised quarterly. Reference B indicates the reason as being the potential to overpressurize upstream piping. This should be clarified. Which basis is correct?

Response 7.0:

Reference A was correct. Make-up flow disruption would occur if the valve was exercised quarterly.

Question 8.0 CV-1404:

Reference A (Item 2.5.1) states that this valve is in the program, and satisfies the Code requirement. Reference B states that this valve is deleted from the program because it does not change position during an emergency. This valve is in the Decay Heat return line from the RCS to the RHR pump and is closed during normal plant operation.

The following information is required before we can evaluate whether or not this valve is to remain in the IST program: Is the valve a containment isolation valve? Does it receive a C.I. signal or safety injection signal?

Response 8.0:

Reference B was correct. CV-1404 is not a containment isolation valve and does not receive a containment isolation signal, nor does it receive a safety injection signal.

Question 9.0 CV-1428 and CV-1429:

Reference A (Item 2.5.1) states these valves are in the program as Category E. Reference B states these valves are deleted from the program for the following reasons: "The valves are used to control decay heat and LPI flow. They do not change position upon ES actuation and physically cannot be locked which precludes classification as Category E."

The following information is requested in order to complete the evaluation: What is the position of the valve during normal power operation - partially open, full open, etc.? Are these valves required to be operator controlled at any time prior to, during or after LPSI phase? Provide circumstances where operator control of these valves is necessary during emergency condition (if applicable).

Response 9.0:

Reference B was correct. The valves are full open during normal operation and are not required to be operator controlled at any time prior to, during or after LPSI phase. There are no circumstances where operator control of these valves is necessary during an emergency condition.

Question 10.0 CV-1410:

Reference A (Item 2.5.2 and 2.5.5.1) states this valve is in the program. Reference B states this valve is deleted from the program because it does not change position during an emergency. Reference B also notes that the valve is interlocked to close or remain closed when RCS pressure is greater than 290 psig.

The following information is required before it can be determined if this valve can be removed from the IST program: Is this valve a containment isolation valve? Does it receive a C.I. signal?

Response 10.0:

Reference B was correct. CV-1410 is not a containment isolation valve and does not receive a containment isolation signal.

Question 11.0 CV-1414 and CV-1415:

Reference A (Item 2.5.3.1) states these valves are in the program and are treated as passive valves, i.e., open and their function is to open during an emergency. Reference B states these valves are deleted from the program.

In order to complete the evaluation, the following information is required: Is there power to these valves or are they racked out? Describe how power is racked out, if applicable. Do these valves have position indicators and are the readouts in the control room? At what frequency does the licensee determine by visual inspection of the

position lights and/or actual valve position that these valves are aligned open? Is there a check list procedure to accomplish this periodic check?

Response 11.0:

There is power to these valves, but they are always open. The power cannot be racked out without also removing power to the position indication in the control room. With this indication in the control room, the operator can verify valve position by visual inspection at any desired frequency. These valves are a part of the start-up valve position check list.

Question 12.0 CA-61 and CA-62:

Reference A (Item 2.5.4.1) based on the SER meeting stated that these valves will be part-stroked only every 3 months. Reference B states that the valves will meet the Code.

Are these valves full-stroke exercised during these quarterly tests?

Response 12.0:

Reference A was correct. These valves will be part-stroked only every 3 months.

Question 13.0 CV-2415 and CV-2419:

Reference A (Item 2.8.3.1) states these valves are in the program as Category B with relief requested and a recommendation that relief be granted. Reference B states these valves are in the program with no category given, but a notation stating "Locked in Position". This should be clarified.

How are these valves locked in position? Please describe physical and/or administrative methods used to lock these valves. Are these valves set up to receive a safety injection signal?

These valves should also be code categorized by the licensee.

Response 13.0:

These valves are Category E at power. They are de-energized with the breaker padlocked and the wheel chain locked. These valves are not set up to receive a safety injection signal.

Question 14.0 BS-4A and BS-4B:

Reference A states that the licensee at the SER meeting had requested relief to exercise these check valves by conducting air flow tests every 5 years as part of the Reactor Building spray header flow tests. The staff questioned the proposed air tests as to the possibility that

seat leakage past a stuck closed check valve could lead to the belief that the valve was being part-stroked open. The licensee was asked to review the proposed testing and provide technical information that would support the proposed air flow tests in light of the staff's concern about seat leakage vs. determination of part-stroking.

Reference B was reviewed and found to request relief for partial-stroke exercising at refueling outages. Also presented was the licensee's basis for not testing at cold shutdown. However, no information was presented to satisfy the concern that the air flow test might not be valid to demonstrate check valve part-stroking.

The licensee is requested to provide a description of the testing performed to stroke these valves and show how it will be determined that seat leakage across a stuck closed valve can be distinguished from the air flow through a part-stroked open valve.

Response 14.0:

As stated in Reference B, full- or partial-stroke exercising of these valves with water is impractical at any time. During the SER meeting, we suggested that the presence of air flow through these valves during our spray header flow test indicates some degree of stroking. However, due to the possibility of air leakage past a stuck closed check valve, we have not been able to correlate the presence of air flow with check valve disk position. We conclude, therefore, that there is no practical means of detecting a full- or partial-stroke of these valves during the service life of ANO-1.

On the basis stated above, we request relief from the Code requirement to full-stroke these valves during each cold shutdown. No testing in lieu of the Code requirement is proposed.

Question 15.0 CV-3823 and CV-3824:

Reference A (Item 2.10.2) states these valves are in the program as Category E. Reference B states these valves are Category E, but has a notation as follows: "To be removed from program." Why are these valves being removed from the program?

Response 15.0:

These valves have not been removed from the program. They are Category B valves. Full-stroke testing at power is not practical because of the possibility of shutdown due to a loss of service water flow. These valves are full-stroke tested each cold shutdown.

Question 16.0 CV-3640 thru CV-3646, CV-3811 and CV-3820;

Reference A (Item 2.10.3.1) states that the licensee was to establish the basis for the relief request and would provide it. Reference B provided the following statement as the basis for exercising at cold

shutdown: "Testing these valves during normal operation would result in inadequate flow to components at high elevations due to reductions in service water flow."

The basis as presented is inadequate and does not present the information necessary to make a proper evaluation. Provide a basis for each of these valves that is consistent with the requirements of NRC Staff "Guidance for Preparing Pump and Valve...Pursuant to 10 CFR 50.55a(g)", dated January 13, 1978, Section II. You are requested to answer the following:

a. What is the position (open or closed) of each of these valves during normal plant operation?

b. Can these valves be part-stroke or full-stroke exercised quarterly? If no, give reasons such as: What equipment is affected by stroking a particular valve and how specifically might this equipment's operation be affected? What is the possible consequences to plant operation such as reactor trip, turbine trip, etc., if applicable?

Response 16.0:

a. The position of these valves varies with the pump configuration. Normal plant operation may entail any of the four configurations in the following table.

	Configuration			
Valve/Pump	a	b	c	d
P4A	Standby (ST)	OP	OP	OP
P4B	Operating (OP)	OP	ST	ST
P4C	Operating	ST	OP	OP
CV-3640	Closed (CL)	CL	OP	CL
CV-3642	Closed	CL	OP	CL
CV-3644	Closed	CL	CL	OP
CV-3646	Closed	CL	CL	OP
CV-3645	Closed	OP	OP	CL
CV-3643	Open (OP)	OP	OP	OP
CV-3641	Open	CL	CL	OP

b. These valves cannot be part-stroke or full-stroke exercised during operation. Lube oil coolers and hydrogen coolers would be deprived of cooling water and high generator bearing temperatures would force a turbine trip.

Question 17.0 CA-90A and CA-90B:

Reference A (Item 2.8.4.1) indicates that at the SER meeting relief was requested to only part-stroke exercise these check valves every 3 months. Reference B states that these valves will meet the Code requirements.

Are these valves considered full-stroke exercised during quarterly tests?

Response 17.0:

These valves have been locked closed and taken out of service.