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CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Forwards response to 810526 safety evaluation requirements re valve inservice testing program.No addl leak testing on Valves 700,701,720 & 721 required.

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JOHN E. MAIER
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August 26, 1981



Director of Nuclear Regulation
Attention: Dennis M. Crutchfield, Chief
Operating Reactor Branch #5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Inservice Valve Testing Program
R. E. Ginna Nuclear Power Plant Unit #1
Docket No. 50-244

Dear Mr. Crutchfield:

Your letter dated May 26, 1981 granted relief from certain of the American Society of Mechanical Engineers (ASME) Code Section XI valve testing requirements. The accompanying safety evaluation contained several sections which required a response from RG&E. The attachment to this letter provides those responses.

Your letter particularly directed our attention to three sections of the safety evaluation, 1.1.1, 1.1.6 and 1.1.8. We were requested to provide responses to these sections in 90 days, 120 days and 120 days respectively. Our response to sections 1.1.1 and 1.1.8 are included in the attachment to this letter. Our response to section 1.1.6 will be delayed, however, we agree to provide the technical specification review which you requested. Although not required, we are also providing a response or clarification for sections 1.1.4, 1.1.5, 1.1.9 and 1.1.10 of the safety evaluation.

Very truly yours,

John E. Maier

Attachment

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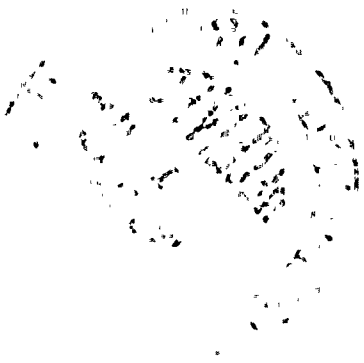

# RESPONSE TO SAFETY EVALUATION
# INSERVICE TESTING PROGRAM - VALVES

ROCHESTER GAS & ELECTRIC CORPORATION
R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

August 1981

The responses given in this document are numbered to correspond with the numbering of the Office of Nuclear Reactor Regulation Safety Evaluation which was sent to Rochester Gas and Electric with Mr. Dennis Crutchfield's May 26, 1981 letter. The safety evaluation is repeated here for those sections requiring a response.

SER

1.1.1 Testing of Valves Which Perform a Pressure Isolation Function

Several safety systems connected to the reactor coolant pressure boundary have design pressures below the reactor coolant system operating pressure. Redundant isolation valves within the Class 1 boundary forming the interface between these high and low pressure systems prevent the low pressure systems from (sic) pressures which exceed their design limit. In this role, the valves perform a pressure isolation function.

We view as important the redundant isolation provided by these valves. We consider it necessary to assure that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. For these reasons, we believe that some method, such as pressure monitoring, leak testing, radiography and ultrasonic testing should be used to assure (sic) the condition of each valve is satisfactory in maintaining this pressure isolation function.

If leak testing is selected as the appropriate method for achieving this objective, the staff believes that the following valves should be categorized as A or AC and leak tested according to IWV-3420 of Section XI of the applicable edition of the ASME Code. These valves are:

853A (Core Deluge Check)
853B (Core Deluge Check)
878J (1-B SI Pump to Cold Leg Loop A)
878G (1-A SI Pump to Cold Leg Loop B)
852A (RHR Pump to RX Vessel)
852B (RHR Pump to RX Vessel)
842A (First Check Valve in Loop A ACC Dump Line)
842B (First Check Valve in Loop B ACC Dump Line)
867A (ACC Dump and SI to Cold Leg Loop B)
867B (ACC Dump and SI to Cold Leg Loop A)
700 (Suction Stop from Loop A Hot Leg to RHR Pumps)
701 (Suction Stop from Loop A Hot Leg to RHR Pumps)
720 (RHR Pump Discharge to Cold Leg Loop B)
721 (RHR Pump Discharge to Cold Leg Loop B)
877A (First Check Valve in Loop B Hot Leg)
878F (Second Check Valve in Loop B Hot Leg)
877B (First Check Valve in Loop A Hot Leg)
878H (Second Check Valve in Loop A Hot Leg)

We have discussed this matter with the licensee and identified the valves listed above. The licensee agreed to consider testing and categorizing each of these valves with the appropriate designation depending on the testing method selected. Whatever method the licensee selects for determining the condition of each valve, the licensee will provide to the NRC for evaluation the details of the testing method which clearly demonstrate the condition of each valve.

The licensee should be aware that some of the above listed valves may be associated with the Event V configuration issue expressed in our letter to the licensee dated February 23, 1980. If the licensee action as a result of this and other followup NRC letters on this subject matter is to test the valves, then the licensee should identify the valves and provide us the testing method and procedure if they have not already done this.

The February 23, 1980 letter was the initiation on our part to accelerate our effort to begin having licensees testing pressure isolation valves. It is the staff position that all pressure isolation valves identified in this section must be considered for testing.

Response

The following valves are covered by Technical Specification 4.3.3.

853A
853B
878J
878G
867A
867B
877A
877B
878F
878H

Valves 853A, 853B, 878J, 878G, 867A and 867B are currently classified as category C valves under the definitions of the ASME Boiler and Pressure Vessel Code Section XI (Section XI) Article IWV-2000. These valves are tested for leakage after refueling and cold shutdowns, and after maintenance, repair or replacement. In addition, valves 878G and 878J are tested for leakage after each safety injection flow test (monthly). The frequency of testing for 853A, 853B, 867A and 867B is appropriate and meets the requirements of Section XI, IWV-3412 for valves which can not be practicably operated during normal operation. The testing of 878G and 878J meets the quarterly test frequency requirements of IWV-3411. The leakage from the valves is limited to less than 5 gpm by Technical Specification 4.3.3. Thus the classification of these valves will be changed in our inservice valve test program to active categories A and C with test frequencies as discussed above.

Valves 877A, 877B, 878F and 878H are currently not listed in our valve test program, however, a pair of these valves in each hot leg high head safety injection line (877A and 878F in loop B hot leg and 877B and 878H in loop A hot leg) together form one of the two pressure boundaries required to be tested by Technical Specification 4.3.3.3. Because these valves are normally closed and the piping contains motor operated valves (MOV's) which are also closed and deenergized, the check valves will not move with the possible exception of when the MOVs are required to be opened

to test the check valves. Thus, once tested the check valves will remain closed. An NRC order dated April 20, 1981 established an appropriate test frequency for these valves to be once every 40 months or after each opening of the MOVs. In the future, these valves will be listed as passive category A valves in our valve testing program with testing required to meet Technical Specification 4.3.3.3.

Check valves 842A and 842B (accumulator check valves) are currently listed as category C valves in our valve testing program. The valves cannot and should not be exercised during plant operation. Exercising of these valves requires that reactor coolant system pressure be reduced to below accumulator pressure. Therefore we propose to modify our inservice test program to include testing of these valves after refueling and cold shutdowns and after maintenance, repair or replacement. Leak testing will be performed to assure primary system integrity by (1) closing each accumulator motor operated discharge valve, pressurizing the line downstream of the check valves and measuring the upstream leakage, or (2) measuring accumulator in-leakage by pressurizing the line downstream of the 842 valves. Our valve testing program will be revised to list these valves as active categories A and C.

MOVs 700, 701, 720 and 721 are category B valves which should not and cannot be exercised during plant operation. The valves are normally closed and in the position required to fulfill their safety function during power operation. The valves are motor operated with valve position indicated in the control room. After closing these valves, power is removed at the breaker to prevent inadvertent operation. Valves 700 and 721 are interlocked with RCS pressure to prevent inadvertent opening. Valves 701 and 720 have key lock switches on the control board to prevent inadvertent opening. Because of the sizing of the valve operator, it is physically impossible for the valves to be opened with a pressure differential across the valve of 500 psi or more. Acceptably low leakage through each pair of valves is demonstrated during each system pressure test following refueling. A relief valve capable of passing 200 gpm provides relief from the lower pressure RHR piping to the pressurizer relief tank. An increase in leakage through the valves during operation would be detected by discrepancies in makeup and letdown rates, by pressurizer relief tank indications, or by RHR system pressure and temperature indication.

Additional discussion on these RHR valves concerning SEP Topic V-11.A is included in Mr. Dennis M. Crutchfield's letter to Mr. John E. Maier dated July 22, 1981 and in Mr. Maier's letter to Mr. Crutchfield dated June 23, 1981.

WASH 1400 (NUREG-75/014) concluded that piping connections to the reactor coolant system "...have the potential to cause a LOCA in which the interior of the reactor vessel may communicate to the environment. All except the LPIS check valve situation... were dismissed for any or a combination of the following reasons:

a. The multiplicity of barriers that would be required to fail would render the LOCA much less probable than the check valves.

b. Failure of the barriers would not involve loss of vital safeguards and the loss of RCS coolant could be accommodated within the design of the interfacing systems through safety and relief provisions, and the coolant loss could be controlled or contained without a core melt occurring.

c. Failure of the barriers would involve a LOCA into the containment and would, therefore, be covered by previous LOCA event trees."

In addition, testing of these valves on an individual basis would require that test personnel work on these lines at times when the reactor coolant system temperature is greater than 350°F. The valves are open and in service at lower temperatures. These conditions would subject personnel to high temperature fluid hazards when connecting or disconnecting test equipment and would give them an unnecessary radiation exposure while working in the containment building near the primary loops. The dose rate near these valves is approximately 100 mr/hour during reactor outages.

Therefore, we have concluded that additional leak testing beyond that already performed on 700, 701, 720 and 721 should not be required.

MOVs 852A and 852B are category B valves which should not be exercised during power operation. These valves provide the second of two boundaries between the reactor coolant system (RCS) and the lower pressure residual heat removal (RHR) system. The valves are normally closed to fulfill their pressure isolation function. One of the two valves is required to open to mitigate large LOCAs (>four inch diameter break). Stroking 852A and 852B during power operation will mean that the boundary between the RCS and the RHR system will be formed by a single check valve. Thus, stroke testing of 852A and 852B is appropriate only during cold and refueling shutdowns consistent with our current valve testing program.

Valves 852A and 852B are provided with position indication in the control room. Acceptably low leakage through each pair of valves is demonstrated during each system pressure test following refueling. A relief valve capable of passing 200 gpm provides relief from the lower pressure RHR piping to the pressurizer relief tank. An increase in leakage through the valves during operation would be detected by discrepancies in makeup and let-down rates, by pressurizer relief tank indications, or by RHR system pressure and temperature indication. Additional leak testing beyond that already performed should not be required.

Leakage from valves 700, 701, 720, 721, 852A and 852B may be substantial (up to 200 gpm) without any overpressurization effects upon the RHR system, however, Technical Specification 3.1.5 requires a plant shutdown for any leakage which is greater than 10 gpm. Categorization of these valves as category B in our valve testing program is appropriate because the seat leakage is not limited to a specific maximum amount and seat leakage is inconsequential for the fulfillment of their function.

Test procedures for the valves listed in this section will be available for inspection at Ginna Station. For those valves which have not previously been required to be tested (842A and 842B), procedures will be available no later than the first test which will be required in accordance with our commitments in this letter.

SER

1.1.4 Test Frequency of Check Valves Tested at Cold Shutdowns

The Code states that, in the case of frequent cold shutdowns, valve testing need not be performed more often than once every three months for Category A and B valves and once every nine months for Category C valves (check valves only). It is our position that Category C valves should be tested on the same schedule as Category A and B valves. This position is also in agreement with the current edition and addenda of the Code. The licensee has agreed to this position that valve testing will not be performed more often than once every three (3) months for Category A, B, and C valves.

Response

The testing frequency for Category C check valves in our inservice valve testing program is generally once every quarter except where plant conditions make testing not practical during plant operation. Valves which cannot be practically tested during operation are required to be tested during cold and refueling shutdowns. The testing requirements for type C valves are clearly identified in the valve testing program, Appendix C to the Quality Assurance Manual.

We agree that valve testing during cold shutdowns should be on a frequency determined as follows: for intervals between cold shutdowns of 3 months or longer, exercise during each shutdown; for intervals of less than 3 months, exercising is not required unless 3 months have passed since the last shutdown exercise.

SER

1.1.5 Licensee Request for Relief to Test Valves at Cold Shutdown

The Code permits valves to be tested at cold shutdown, and the Code conditions under which this is permitted are noted in Attachment A. These valves are specifically identified by the licensee and are full-stroke exercised during cold shutdowns; therefore, the licensee is meeting the requirements of the

ASME Code and it will not be necessary to grant relief. However, during our review of the licensee's IST program, we have verified that it was not practical to exercise these valves during power operation and that we agree with the licensee's basis.

It should be noted that the staff differentiates for valve testing purposes between the cold shutdown mode and the refueling mode. That is, for testing purposes the refueling mode is not considered as a cold shutdown.

Response

The staff differentiation for valve testing purposes between the cold shutdown mode and the refueling mode is unclear. A refueling shutdown is defined by Technical Specification 1.2 as Tavg $\leq$ 140°F and $\Delta$K/K reactivity $\leq$ - 10%. Cold shutdown is Tavg $\leq$ 200°F and $\Delta$K/K reactivity $\leq$ - 1%. Thus refueling shutdown conditions are a subset of cold shutdown conditions and all testing done during refueling conditions is also considered to have been done at cold shutdown.

SER

1.1.6 Changes to the Technical Specification

In a November 1976 letter to the licensee, we provided an attachment entitled "NRC Guidelines for Excluding Exercising (Cycling) 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 in a non-safe position 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 reports, 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. It should be noted that reduction in redundancy is not a basis for a T.S. change nor is it by itself a basis for relief from exercising in accordance with Section XI.

The licensee has agreed to review the plant's T.S. and to consider the need to propose T.S. change which would have the effect of precluding such testing. After making this review, if the licensee determines that the T.S. should be changed because the guidelines are applicable, the licensee will submit to the NRC in conjunction with the proposed T.S. change, 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 the licensee determines that the T.S. should not be changed because the guidelines are not applicable or cannot be followed, the licensee will submit the reasons that led to their determination for each potentially affected section of the T.S.

Response

We will review the plant technical specifications and consider the need for changes to preclude undesireable testing. However, our review and technical specification changes which may result from the review will not be completed within 120 days as suggested in the SER cover letter. Due to the press of other work, the review will probably not be completed before the end of 1981.

SER

1.1.8 Valve Testing at Cold Shutdown

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 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, exceptions to the 48 hours may be taken. The licensee has agreed to consider testing in accordance with these requirements.

Response

The testing of valves required at cold shutdown and refueling outages will normally take four (4) days to complete. When cold shutdowns are of a shorter duration (2-3 days), test personnel attempt to test as many valves as possible without holding up the startup of the unit with testing beginning no longer than 48 hours after the plant reaches cold shutdown (as defined in Technical Specification 1.2). For very short cold shutdowns (less than 48 hours), it is impossible to mobilize test personnel to implement the testing program under the required procedural controls, therefore no valves are required to be tested. It is possible that, during a four (4) day cold shutdown, the work load on test personnel may preclude their completion of all the required valve tests prior to startup. Valve testing during cold shutdowns need not be more frequent than one test per quarter for each valve in the test program.

A requirement for testing at cold shutdown no later than two hours after reaching cold shutdown and no later than 48 hours after shutdown is impractical and may be impossible in some circumstances. The plant may not be in cold shutdown within 48 hours of shutdown on some occasions. Test personnel may not be available within 2 hours after reaching cold shutdown if the cooldown is rapid. Our commitment to begin testing no longer than 48 hours after the plant reaches cold shutdown is appropriate.

SER

1.1.9 Category A Valve Leak Check Requirements for Containment Isolation Valves (CIV)

All CIVs shall be classified as Category A valves. The Category A valve leak rate test requirements of IWV-3420 (a-e) have been superseded by Appendix J requirements for CIVs. The staff has concluded that the applicable leak test procedures and requirements for CIVs are determined by 10 CFR 50 Appendix J. Relief from paragraph IWV-3420 (a-e) for CIVs presents no safety problem since the intent of IWV-3420 (a-e), which is to demonstrate the leak tightness of the valves, is met by Appendix J requirements.

The licensee shall comply with Sections f and g of IWV-3420 until relief is requested from these paragraphs. It should be noted that these paragraphs are only applicable where a Type C Appendix J leak test is performed.

Based on the considerations discussed above, the staff concludes that the alternate testing proposed above will give the reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

Response

Sections f and g of IWV-3420 referred to above are apparently paragraphs in the 1974 version of the ASME code. Our current valve testing program is based upon the 1977 version of the code with addenda through Summer 1978. It is correct that the requirements of IWV-3420 (a-e) have been superceded by Appendix J to 10 CFR Part 50. The leakage limits and repair requirements of the 1974 IWV-3420 sections f and g are superceded by the more recent code and Technical Specification 4.4.2. A relief request from 1974 IWV-3420 sections f and g is not applicable.

SER

1.1.10 Application of Appendix J Testing to the IST Program

The Appendix J review for this plant is completely separate review from the IST program review. However, the determinations made by that review are directly applicable to the IST program. Our review has determined that the current IST program as submitted by the licensee correctly reflects our interpretation of Section XI vis-a-vis Appendix J. The licensee has agreed that, should the Appendix J program be amended, they will amend their IST program accordingly.

Response

Appropriate amendments to the inservice test program will be considered if the Appendix J program is revised.