



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO CHANGES TO THE THIRD TEN-YEAR INTERVAL INSERVICE
TESTING PROGRAM FOR PUMPS AND VALVES, (TAC NOS. M90651 AND M90652)
VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION, UNITS 1 AND 2
DOCKET NUMBERS 50-280 AND 50-281

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i) or (a)(3)(ii), and (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; or (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; and (3) conformance is impractical for its facility. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," provides guidance and alternatives to the Code requirements determined acceptable to the staff. Certain alternatives that conform with the guidance in GL 89-04 may be implemented without additional NRC approval, provided the guidance in GL 89-04, Section D, is followed.

Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to authorizing alternatives and granting or not granting the relief requested as part of the licensee's IST Program are contained in this Safety Evaluation (SE).

By letter dated October 11, 1994, Virginia Electric and Power Company, the licensee for Surry Power Station Units 1 and 2, submitted changes to the third ten-year interval IST Program. A request for an extension of relief requests P-16 and V-46 was submitted by letter dated June 2, 1994. Additional information regarding relief request V-26 was submitted by letters dated January 24, 1995, and March 7, 1995. This SE covers the IST program relief requests and additional information contained in these submittals. The Surry 1 and 2 IST Program covers the third ten-year interval, which began on May 10, 1994, and will end on May 10, 2004, and is based on the requirements in the 1989 Edition of ASME Section XI.

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2.0 EVALUATION

The staff has reviewed the information concerning Revision 0, Change 1, of the Surry 1 and 2 IST Program relief requests submitted by the licensee in a letter dated October 11, 1994. The staff grants relief or authorizes alternatives as stated in this SE.

2.1 Relief Requests P-22 (Unit 1) and P-19 (Unit 2)

P-22 of the Unit 1 IST program and P-19 of the Unit 2 IST program request relief from the full-scale range requirements of OM-6, Paragraph 4.6.1.2, for the component cooling water (CCW) pumps, 1-CC-P-2A, 1-CC-P-2B, 2-CC-P-2A, and 2-CC-P-2B. The licensee proposes to use inlet pressure gauges with a full-scale range of 0 to 3.5 psig.

2.1.1 Licensee's Basis for Relief

The licensee states:

"Recently installed inlet pressure gauges have a full scale range of 0 to 3.5 psig. Readings from these inlet pressure gauges over the past year indicate that the dynamic pressures fall within the bottom third of full scale. However, the difference in the error between the 0 to 3.5 psig gauges and gauges that would meet the three times full-scale rule are so small that the 0 to 3.5 psig gauges can be considered to be equivalent in terms of accuracy for determining differential pressure."

"For example, the lowest recorded inlet pressure for pump 1-CC-P-2B is 0.8 psig. A gauge that meets the three times full-scale rule would have a full scale of 2.4 psig or less. A 2% accuracy for the 2.4 psig gauge translates to an error of 0.05 psig. A 2% accuracy for the 3.5 psig gauge translates to an error of 0.07 psig. The difference in error of 0.02 psig is insignificant when determining the differential pressures for these pumps which range between 50 and 60 psig. Therefore, the two gauges can be considered to be equivalent in terms of accuracy for determining differential pressure."

2.1.2 Alternative Testing

The licensee proposes:

"Inlet pressure will be measured with gauges that have a full-scale of 0 to 3.5 psig."

2.1.3 Evaluation

Paragraph 4.6.1.2(a) of OM-6 specifies that the full-scale range of each analog instrument shall not be greater than three times the reference value. NUREG-1482 states: "When the range of a permanently-installed analog instrument is greater than three times the reference value but the accuracy of the instrument is more conservative than the Code, the staff will grant relief when the combination of the range and accuracy yields a reading at least

equivalent to the reading achieved from instruments that meet the Code requirements." The currently-installed inlet pressure gauges have a full-scale range of 0 to 3.5 psig. Inlet pressure readings have fallen within one third of the full-scale reading. However, the differential pressure for the CCW pumps is approximately 50 to 60 psig. The minor difference between the currently installed gauges and gauges which meet the Code range requirements is negligible when measuring this differential pressure. The $\pm 2\%$ accuracy requirement for a differential pressure of 50 psig translates to 1 psig. The currently-installed pressure gauges can meet this accuracy requirement. Therefore, the combination of range and accuracy for differential pressure measurement yields a reading with an acceptable level of quality and safety.

2.1.4 Conclusion

Using the installed gauges is an acceptable alternative means to measuring inlet pressure in accordance with Paragraph 4.6.1.2(a) of OM-6. When replacing currently-installed pressure gauges presents an undue burden, the licensee may use gauges that do not meet Code requirements provided the combination of range and accuracy yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements. The proposed alternative testing provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

2.2 Relief Request P-16 and V-46

P-16 of the Unit 1 IST program requests interim relief from the requirements of OM-6, Paragraphs 4.3 and 4.6.2.2 to measure and evaluate flow rate, for the main control room (MCR) air conditioning pumps, 1-VS-P-1A, 1-VS-P-1B and 1-VS-P-1C. A related relief request, V-46 of the Unit 1 IST program, requests relief from the test frequency requirements of OM-10, Paragraph 4.3.2.4(c), for the check valves in the service water supply lines to the main control room air conditioning system chillers, 1-SW-313, 1-SW-323 and 2-SW-333. By letter dated October 20, 1994, the NRC staff granted interim relief for P-16 pursuant to 10 CFR 50.55a(f)(6)(i) for one year or until the next refueling outage, whichever is later, and provisional relief for V-46 pursuant to 10 CFR 50.55a(f)(6)(i). By letter dated June 2, 1994, the licensee requested that the alternate testing identified in P-16 and V-46 be extended through the end of the next scheduled Unit 1 refueling outage scheduled for the third quarter of 1995. Based upon the disposition of these relief requests in the October 20, 1994, SE, these extensions do not appear to be necessary. No further review is necessary at this time.

2.3 Relief Request P-17

P-17 of the licensee's Unit 1 IST program requests relief from the requirements of OM-6, Paragraph 4.3, to obtain reference values at repeatable points of operation for the main control room air conditioning system chilled water circulating pumps, 1-VS-P-2A, 1-VS-P-2B, and 1-VS-P-2C. In an SE dated October 20, 1994, the staff granted relief for P-17 pursuant to 10 CFR 50.55a(f)(6)(i) with the provision that the licensee implement certain criteria associated with the use of pump curves for IST. The licensee has recently completed a control room air conditioning system upgrade in which

pumps 1-VS-P-1D, 1-VS-P-1E, 1-VS-P-2D and 1-VS-P-2E were added. Due to the impracticality of establishing a reference flow, the license has added pumps 1-VS-P-2D and 1-VS-P-2E to P-17. The addition of these pumps does not impact the staff's previous evaluation of P-17 and is, therefore, acceptable for the same reasons and with the same provisions on the testing.

2.4 Non-Code Alternative Testing PNC-1

The licensee has modified Non-Code Alternative Testing PNC-1 to specify that the transducers used for testing the diesel fuel oil transfer pumps have a low end frequency response of 10 hz versus the 3.8 hz required by the Code for a pump running at 690 rpm. Evaluation of testing for non-code pumps is not required by 10 CFR 50.55a and is therefore not evaluated in this SE.

2.5 Relief Request V-52

V-52 requests relief from the leak rate test corrective action requirements of OM-10, Paragraph 4.2.2.3(f), for certain refueling water storage tank (RWST) isolation valves. The licensee has formally added this relief request to the Unit 1 and Unit 2 IST program. In an SE dated October 20, 1994, the staff evaluated and provisionally authorized the licensee's proposed alternative testing for relief request V-52 pursuant to 10 CFR 50.55a(a)(3)(ii). No further review is necessary at this time.

2.6 Relief Request V-26

The licensee's October 11, 1994, submittal, proposed to modify relief request V-26 for the accumulator discharge check valves back-seat testing requirements for Units 1 and 2. The licensee provided additional information regarding V-26 in a letter dated January 24, 1995. Following discussions with the NRC staff, the licensee withdrew the proposed modifications to V-26 in a letter dated March 7, 1995. The licensee has proposed to address the issue of exercising the accumulator discharge check valves as part of the resolution of Anomaly 14 from the staff's October 20, 1994 SE.

2.7 Relief Request V-53

The licensee has added control room condenser water system discharge check valves 1-SW-839 and 840 as part of a system upgrade. V-53 of the licensee's Unit 1 IST program requests relief from the disassembly and inspection frequency requirements of OM-10, Paragraph 4.3.2.4(c) for these check valves.

2.7.1 Basis For Request

The licensee states:

"The discharge check valves are downstream from the recirculation loops for two of the five trains in the control room condenser water system. These two trains were added to the control room air conditioning system in 1994 and were designed to operate with a service water temperature of 95 F. These two trains have such a cooling capacity that one of the two trains can absorb the heating load of the entire control room air

conditioning system. To maintain a high service water temperature, these trains must be operated with most of the service water flow diverted to the recirculation lines."

"To achieve full design flow through the check valve, one train would have to be isolated and the flow of the other train diverted to the discharge check valve. If the flow was diverted to the discharge check valve, the service water temperature would drop and the condenser system would trip off line on low condenser suction pressure. Thus both trains would be out of service. Also, the control room air conditioning system heat load balance would be upset."

"The Surry control room is common to both units. One of the two additional trains must be available for service while either Unit 1 or Unit 2 is operable. Therefore, performing the full flow test is not practical when either unit is operating. As an alternate test, these valves will be disassembled and inspected."

"These check valves can be disassembled while the plant is operating. To allow for flexibility in planning for refueling outages and still meet the intent of OM Part 10, the valves will be disassembled on a reactor refueling frequency but not necessarily during refueling outages."

2.7.2 Alternate Testing Proposed

The licensee proposes:

"These valves will be placed into a group and one valve from the group will be disassembled and inspected on a reactor refueling frequency. A different valve will be disassembled for each inspection. If a valve fails its inspection, the remaining valve will be disassembled and inspected. The check valves will be partial stroke tested every three months. This test frequency is in accordance with Generic Letter 89-04, Position 2."

2.7.3 Evaluation

Paragraph 4.3.2.4(c) of OM-10 specifies that disassembly of a valve may be used as an alternative to verifying obturator movement by flow, pressure, or other positive means, or by using a mechanical exerciser. Therefore, the alternative method is acceptable in accordance with OM-10 for both opening and closing verification; however, Paragraph 4.3.2.4(c) requires that the disassembly be performed each outage, whereas GL 89-04, Position 2, states: "Where the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed." This allows grouping of similar valves and employing a sampling plan such that one valve of the group is inspected each refueling outage, with any one valve disassembly not to exceed once each 6 years. The subject valves are identical and are installed in two trains of a system so they each experience the same service. Therefore, one of the two valves should be

representative of any degrading phenomenon occurring over one cycle of operation, with both valves being disassembled if one indicates a problem. It would be a hardship or unusual difficulty without a compensating increase in the level of quality and safety to require the licensee to disassemble both valves each refueling outage when the condition of both valves can be monitored by alternating the inspection (based on the similarities of design and operating/service conditions). Therefore, the grouping and inspection of the two valves may be conducted in accordance with the guidance in Position 2 of GL 89-04, as committed in the relief request. The implementation of the guidance is subject to NRC inspection.

2.7.4 Conclusion

Disassembly and inspection is an acceptable alternative to other means of verifying obturator movement in accordance with Paragraph 4.3.2.4(c) of OM-10. When disassembly and inspection of both valves is burdensome, a sampling plan may be used pursuant to GL 89-04. Based on the hardship or unusual difficulty that is created by requiring disassembly of both valves each refueling outage, it is acceptable for the licensee to use the guidance of GL 89-04, Position 2, for establishing and implementing a sampling plan for the disassembly schedule. The alternative schedule is authorized pursuant to 10 CFR 50.55a (a)(3)(ii).

2.8 Control Room Condenser Water System Pressure Control Valves

V-47 of the licensee's Unit 1 IST program requests relief from the stroke time measurement and acceptance criteria requirements of OM-10, 1.3 and 4.2.1.8 for various valves including the control room condenser water system pressure control valves. In an SE dated October 20, 1994, the staff granted provisional relief pursuant to 10 CFR 50.55a(f)(6)(i) for V-47. The licensee has recently completed a control room condenser water system upgrade in which pressure control valves 1-SW-PCV-100D, E and 1-SW-PCV-101D, E were added. Due to limitations on obtaining repeatable stroke times, the licensee has added these valves to V-47. The addition of these valves falls within and does not impact the staff's previous evaluation of V-47 and is, therefore, acceptable.

3.0 CONCLUSION

The staff concludes that the relief requests as evaluated by this SE will provide reasonable assurance of the operational readiness of the pumps and valves to perform their safety-related functions. The staff has determined that authorizing alternatives pursuant to 10 CFR 50.55a (f)(6)(i), and (a)(3)(i) or (a)(3)(ii) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest. In making this determination, the staff has considered the impracticality of performing the required testing and the burden on the licensee that could result if the requirements were imposed.

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Date: August 30, 1995

that the changes you proposed to the third 10-year interval inservice testing program for Surry, Units 1 and 2, are acceptable and the requested relief is granted. We are, therefore, closing out TAC Nos. M90651 and M90652.

Sincerely,

Original Signed By L. Raghavan for:
David B. Matthews, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosure: As stated

cc w/enclosure: See next page

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