



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

June 18, 2024

Eric S. Carr
President – Nuclear Operations and
Chief Nuclear Officer
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION, UNITS 1 AND 2 – PROPOSED ALTERNATIVE RELIEF REQUESTS P-3 AND P-4 INSERVICE TESTING OF BORIC ACID, COMPONENT COOLING WATER PUMPS (EPID L-2023-LLR-0059)

Dear Eric Carr:

By letter dated October 12, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23285A092), Virginia Electric And Power Company (licensee) submitted relief requests (RRs) P-3 and P-4 to the U.S. Nuclear Regulatory Commission (NRC) for authorization of proposed alternatives to certain inservice testing (IST) requirements in the 2020 Edition of the American Society of Mechanical Engineers (ASME) Operation and Maintenance of Nuclear Power Plants Division 1, OM Code: Section IST (OM Code) as incorporated by reference in Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) at the Surry Power Station (SPS), Units 1 and 2.

Specifically, pursuant to 10 CFR 50.55a(z)(1), the licensee asserted that the alternatives in RRs P-3 and P-4 provide an acceptable level of quality and safety in lieu of certain ASME OM Code requirements for specific pumps at SPS, Units 1 and 2.

Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of RRs P-3 and P-4 at SPS, Units 1 and 2, for the sixth interval IST program, which is scheduled to begin on August 10, 2024.

All other ASME OM Code requirements for which relief or an alternative was not specifically requested and granted or authorized (as applicable) in the subject requests remain applicable.

E. Carr

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If you have any questions, please contact me at (301) 415-5136, or via email at John.Klos@nrc.gov.

Sincerely,

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosure:
Safety Evaluation

cc: Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUESTS P-3 AND P-4

RELATED TO THE SIXTH INTERVAL INSERVICE TESTING PROGRAM

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-280 AND 281

EPID L-2023-LLR-0059

1.0 INTRODUCTION

By letter dated October 12, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23285A092), Virginia Electric And Power Company (licensee) submitted relief requests (RRs) P-3 and P-4 to the U.S. Nuclear Regulatory Commission (NRC) for authorization of proposed alternatives to certain inservice testing (IST) requirements in the 2020 Edition of the American Society of Mechanical Engineers (ASME) Operation and Maintenance of Nuclear Power Plants, Division 1, OM Code: Section IST (OM Code) as incorporated by reference in part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) at the Surry Power Station (SPS), Units 1 and 2.

Specifically, pursuant to 10 CFR 50.55a(z)(1), the licensee asserted that the alternatives in RRs P-3 and P-4 provide an acceptable level of quality and safety in lieu of certain ASME OM Code requirements for specific pumps at SPS, Units 1 and 2.

2.0 REGULATORY EVALUATION

The NRC regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating plants," state, in part, that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, pumps and valves that are within the scope of the ASME OM Code must meet the IST requirements (except design and access provisions) set forth in the ASME OM Code and addenda that become effective subsequent to editions and addenda specified in 10 CFR 50.55a(f)(2) and that are incorporated by reference in 10 CFR 50.55a(a)(1)(iv), to the extent practical within the limitations of design, geometry, and materials of construction of the components.

The NRC regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of 10 CFR 50.55a(f) may be used, when authorized by the NRC, if the licensee demonstrates (1) the proposed alternatives would provide an acceptable level of quality and safety, or (2) that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Enclosure

3.0 TECHNICAL EVALUATION

The information provided by the licensee in support of RRs P-3 and P-4 have been evaluated and the bases for disposition are documented below.

3.1 Licensee's Relief Request P-3

Applicable OM Code Edition

The IST Code of Record for the sixth interval IST program at SPS, Units 1 and 2, is the 2020 Edition of the ASME OM Code as incorporated by reference in 10 CFR 50.55a. The sixth interval IST program at SPS, Units 1 and 2, begins on August 10, 2024.

ASME OM Code Components Affected

The plant equipment within the scope of this request are:

Component ID	Component Description	ASME Class	Pump Group
1-CH-P-2A	Boric Acid Transfer Centrifugal Pump	2	A
1-CH-P-2B	Boric Acid Transfer Centrifugal Pump	2	A
1-CH-P-2C	Boric Acid Transfer Centrifugal Pump	2	A
1-CH-P-2D	Boric Acid Transfer Centrifugal Pump	2	A

Function: The boric acid transfer pumps supply boric acid to the suction of the charging pumps for emergency boration.

Applicable ASME OM Code Requirements

ASME OM Code, subsection ISTB, "Inservice Testing of Pumps in Water-Cooled Reactor Nuclear Power Plants – Pre-2000 Plants," paragraph ISTB-3510, "General," subparagraph (b), *Range*, item (1), requires that the full-scale range of each analog instrument shall be not greater than three times the reference value.

Licensee's Proposed Alternative

The licensee proposes that the inlet pressure for the Group A and Comprehensive Pump Tests for the specified boric acid transfer pumps at SPS, Units 1 and 2, will be measured with gauges that have a full-scale range of 0 to 15 pounds per square inch gauge (psig).

Licensee's Reason for Request

The licensee indicates that the installed inlet pressure gauges for the Group A and comprehensive pump tests for the specified pumps have a full-scale range of 0 to 15 psig . These instruments were sized by evaluating the static pressures present at the suction side of the pumps and applying the three times rule of ISTB-3510(b)(1). When the pumps are

started, the pressure at the suction side of the pumps drops to approximately 2 psig; therefore, the inlet pressure gauges do not meet the three times rule for dynamic inlet pressure. Using a lower range temporary gauge on a quarterly basis presents a hardship because the process fluid contains boric acid and is contaminated. The gauges could also be exposed to an over-range condition (static pressures in excess of 6 psig) which may damage the lower range temporary instruments.

The licensee asserts that the difference in the error between the 0 to 15 psig gauges and gauges that would meet the three times full-scale rule are so small that the 0 to 15 psig gauges can be considered equivalent in terms of accuracy for determining differential pressure. Some historical readings show a suction pressure as low as 0.5 psig which would lead to a range of 0-1.5 psig to meet the three times rule. A 0.5 percent accuracy for the 1.5 psig gauge translates to an error of 0.0075 psig. A 0.5 percent accuracy for the 15 psig gauge translates to an error of 0.075 psig. The difference in error of 0.0675 psig is insignificant when determining the differential pressures for these pumps which range between 90 and 110 psid (pounds per square inch differential). Therefore, the licensee considers that the gauges can be considered equivalent in terms of accuracy for determining differential pressure.

Licensee's Basis for Use

The licensee states that using the provisions of this request as an alternative to the specific requirements of ISTB-3510(b)(1) for the applicable pumps will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(z)(1), the licensee requests authorization to use the proposed alternative to the specific ASME OM Code requirements identified in this request.

NRC Staff Evaluation

The boric acid transfer pumps at SPS, Units 1 and 2, supply boric acid to the suction of the charging pumps for emergency boration. The ASME OM Code, subsection ISTB, paragraph ISTB-3510(b)(1), requires that the full-scale range of each analog instrument not be greater than three times the reference value. The licensee indicates that the installed inlet pressure gauges for the Group A and comprehensive pump tests for these pumps have a full-scale range of 0 to 15 psig. When the pumps are started, the pressure at the suction side of the pumps drops to approximately 2 psig; therefore, the inlet pressure gauges do not meet the three times requirement for dynamic inlet pressure. To meet the ASME OM Code requirements, the licensee would be required to install temporary instruments at the inlet of the boric acid transfer pumps prior to each quarterly test. Therefore, the licensee proposed in RR P-3 that the inlet pressure for the Group A and comprehensive pump tests for the applicable boric acid transfer pumps be measured with gauges that have a full-scale range of 0 to 15 psig.

Under 10 CFR 50.55a(z)(1), the licensee asserts that the alternative described in RR P-3 provides an acceptable level of quality and safety because the difference in the error between the 0 to 15 psig gauges and gauges that would meet the three times full-scale rule is very small. The difference to be insignificant when determining the differential pressures for the boric acid transfer pumps, which range between 90 and 110 psid. Therefore, the gauges can be considered equivalent in terms of accuracy for determining differential pressure.

The NRC staff has reviewed the licensee's proposed alternative in RR P-3 for SPS, Units 1 and 2. ASME OM Code, subsection ISTB, paragraph ISTB-3510(b)(1), is intended to provide reasonable assurance that the range used for pressure instrumentation allows meaningful monitoring of potential pump degradation. The licensee's proposed alternative meets the intent of the ASME OM Code requirements because the difference resulting from the use of the

proposed instrumentation is very small. Therefore, the NRC staff finds that the licensee's proposed alternative in RR P-3 provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1) for the testing of the specified boric acid transfer pumps at SPS, Units 1 and 2.

3.2 Licensee's RR P-4

Applicable OM Code Edition

The IST Code of Record for the sixth Interval IST program at SPS, Units 1 and 2, is the 2020 Edition of the ASME OM Code as incorporated by reference in 10 CFR 50.55a. The sixth Interval IST program at SPS, Units 1 and 2, begins on August 10, 2024.

ASME OM Code Components Affected

The plant equipment within the scope of this request are:

Component ID	Component Description	ASME Class	Pump Group
1-CC-P-2A	Unit 1 Component Cooling Water Charging Pump Centrifugal Pump	3	A
1-CC-P-2B	Unit 1 Component Cooling Water Charging Pump Centrifugal Pump	3	A
2-CC-P-2A	Unit 2 Component Cooling Water Charging Pump Centrifugal Pump	3	A
2-CC-P-2B	Unit 2 Component Cooling Water Charging Pump Centrifugal Pump	3	A

Applicable ASME OM Code Requirements

ASME OM Code, subsection ISTB, "Inservice Testing of Pumps in Water-Cooled Reactor Nuclear Power Plants – Pre-2000 Plants," paragraph ISTB-3510, "General," subparagraph (b), *Range*, item (1), requires that the full-scale range of each analog instrument shall be not greater than three times the reference value.

Licensee's Proposed Alternative

The licensee proposes that the inlet pressure for the Group A and comprehensive pump tests of the specified component cooling water charging pump centrifugal pumps will be measured with gauges that have a full-scale of 0 to 3.5 psig.

Licensee's Reason for Request

The licensee indicates that the installed inlet pressure gauges used for the Group A and comprehensive pump tests of the specified pumps have a full-scale range of 0 to 3.5 psig. The 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 equivalent in terms of accuracy for determining differential pressure.

As an example, the licensee states that inlet pressures as low as 0.65 psig have been recorded for pump 1-CC-P-2B. A gauge that meets the three times full-scale rule would have a full-scale of 0 to 1.95 psig or less. A 0.5 percent accuracy for the 1.95 psig gauge translates to an error of 0.00975 psig. A 0.5 percent accuracy for the 3.5 psig gauge translates to an error of 0.0175 psig. The difference in error of 0.00775 psig is insignificant when determining the differential pressures for these pumps which range between 50 and 60 psid. Therefore, the gauges can be considered equivalent in terms of accuracy for determining differential pressure.

Licensee's Basis for Use

The licensee states that using the provisions of this request as an alternative to the specific requirements of ISTB-3510(b)(1) for the applicable pumps will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(z)(1), the licensee requests authorization to use the proposed alternative to the specific ASME OM Code requirements identified in this request.

NRC Staff Evaluation

The component cooling water charging pump centrifugal pumps at SPS, Units 1 and 2, supply cooling water to transfer heat from the charging pump mechanical seals. The ASME OM Code, subsection ISTB, paragraph ISTB-3510(b)(1), requires that the full-scale range of each analog instrument not be greater than three times the reference value. The licensee indicates that the installed inlet pressure gauges used for the Group A and comprehensive pump tests for these pumps have a full-scale range of 0 to 3.5 psig. As an alternative to the ISTB-3510(b)(1) requirement, the licensee proposed in RR P-4 that the installed gauges be used to measure the differential pressure for the applicable component cooling water charging pump centrifugal pumps.

Under 10 CFR 50.55a(z)(1), The alternative in RR P-4 provides an acceptable level of quality and safety because the difference in the error between the 0 to 3.5 psig installed gauges and gauges that would meet the three times full-scale requirement is very small. The difference is insignificant when determining the differential pressures for the component cooling water charging pump centrifugal pumps which range between 50 and 60 psig. Therefore, the gauges can be considered equivalent in terms of accuracy for determining differential pressure.

The NRC staff has reviewed the licensee's proposed alternative in RR P-4 for SPS, Units 1 and 2. ASME OM Code, subsection ISTB, paragraph ISTB-3510(b)(1), is intended to provide reasonable assurance that the range used for pressure instrumentation allows meaningful monitoring of potential pump degradation. The licensee's proposed alternative meets the intent of the ASME OM Code requirements because the difference resulting from the use of the proposed instrumentation is very small. Therefore, the NRC staff finds that the licensee's proposed alternative in RR P-4 provides an acceptable level of quality and safety pursuant to

10 CFR 50.55a(z)(1) for the testing of the specified component cooling water charging pump centrifugal pumps at SPS, Units 1 and 2.

4.0 CONCLUSION

As set forth above, the NRC staff has determined that RRs P-3 and P-4 for SPS, Units 1 and 2, as described in the licensee's submittal dated October 12, 2023, provide an acceptable level of quality and safety for the proposed testing for the specified pumps for the sixth interval IST program at SPS, Units 1 and 2. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of RRs P-3 and P-4 at SPS, Units 1 and 2, for the sixth interval IST program, which is scheduled to begin on August 10, 2024.

All other ASME OM Code requirements as incorporated by reference in 10 CFR 50.55a for which relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject requests remain applicable.

Principal Contributors: Nicholas Hansing, NRR
Thomas Scarbrough, NRR

Date: June 18, 2024

SUBJECT: SURRY POWER STATION, UNITS 1 AND 2 – PROPOSED ALTERNATIVE RELIEF REQUESTS P-3 AND P-4 INSERVICE TESTING OF BORIC ACID, COMPONENT COOLING WATER PUMPS (EPID L-2023-LLR-0059) DATED JUNE 18, 2024

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