

August 21, 2001

Mr. David A. Christian
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: SURRY POWER STATION UNITS 1 AND 2 RE: ASME SECTION XI,
INSERVICE INSPECTION (ISI) PROGRAM RELIEF REQUEST (TAC NOS.
MB1352 and MB1353)

Dear Mr. Christian:

This letter grants the relief you requested from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code Section XI for Surry Power Stations, Units 1 and 2. The relief relates to surface examinations of pump casing welds for safety injection (SI) and outside recirculation spray (RS) pumps.

By letter dated March 5, 2001, Virginia Electric and Power Company (VEPCO) proposed relief from the acceptance criteria of the ASME B&PV Code Section XI to use alternative acceptance criteria for the surface examination of pump casing welds for the Surry SI and outside RS pumps during the third 10-year inspection interval. The relief proposals were identified as SR-004, SR-021, and SR-022 for Unit 1, and SR-004, SR-027, and SR-028 for Unit 2.

Our evaluation and conclusion are contained in the enclosed Safety Evaluation. The NRC staff has concluded that compliance with the Code requirements is impractical for the pump casing welds identified in your relief request due to inaccessibility of the welds. The staff has further determined that if the Code requirements were imposed on VEPCO, the pumps would have to be redesigned, which would impose a significant burden upon VEPCO. We have determined that your proposed alternative examination requirements provide reasonable assurance of structural integrity of the subject welds. Therefore, relief is granted from the Code requirement pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i) for the third 10-year ISI interval of Surry, Units 1 and 2. The relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest given due consideration to the burden upon VEPCO that could result if the Code requirements were imposed on the facility.

David A. Christian

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The staff has completed its evaluation of this request; therefore, we are closing TAC Nos. MB1352 and MB1353.

Sincerely,

/RA by Robert Martin for/

Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
THIRD 10-YEAR INTERVAL REQUESTS FOR RELIEF
NOS. SR-004 REV.1, SR-021, SR-022, SR-027, AND SR-028
SURRY POWER STATION, UNITS 1 AND 2
VIRGINIA ELECTRIC AND POWER COMPANY
DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated March 5, 2001, Virginia Electric and Power Company, the licensee, requested relief from certain inservice examination requirements of the 1989 Edition of the ASME Code, Section XI. The proposed relief, applicable to the third 10-year inspection interval, pertains to the limited surface examination coverage of the pump casing welds on the Safety Injection (SI) and the outside Recirculation Spray (RS) pumps of Surry, Units 1 and 2. The welds identified in the licensee's submittal were inaccessible for surface examination due to either being under concrete or being obstructed by other structures. The pump casings that are embedded in concrete are also inaccessible from the inside surface due to the size of the casing and the interference from the pump shaft.

2.0 BACKGROUND

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (Code) and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests

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conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable Code of Record for the third 10-year ISI interval of the Surry Power Station, Units 1 and 2, is the 1989 Edition of ASME Section XI.

2.1 REQUEST FOR APPROVAL OF AN ALTERNATIVE

Pursuant to 10 CFR 50.55a(g)(5), if the licensee has determined that conformance with certain Code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in 10 CFR 50.4, information to support the determinations. 10 CFR 50.55a(g)(6)(i) states that the Commission will evaluate determinations under paragraph (g)(5) of this section that Code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

3.0 DISCUSSION

3.1 IDENTIFICATION OF COMPONENTS

Relief Request No. SR-004 Rev.1

Outside RS System

Pump Casing Weld Nos. 2-01, 2-02, 2-03, 2-04, and 0-12 in both trains

SI System

Pump Casing Weld Nos. 2-01, 2-02, 2-03, 2-04, and 0-13 in both trains

Relief Request Nos. SR-021 and SR-027

SI System

Pump Casing Weld Nos. 2-05, 0-10, and 0-12

Relief Request Nos. SR-022 and SR-028

Outside RS System

Pump Casing Weld Nos. 2-05 and 0-11

3.2 CODE REQUIREMENTS

The 1989 Edition of ASME Section XI, Table IWC-2500-1, Examination Category C-G, Item Number B6.10, requires a surface examination of 100% of pump casing welds each inspection interval. In the case of multiple pumps of similar design, size, function, and service in a system, the examination of only one pump is required.

3.3 CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

Relief is requested from fully performing the Code-required surface examination on the pump casing welds identified above.

3.4 LICENSEE'S BASIS FOR RELIEF

Relief Request No. SR-004 Rev. 1

The Outside RS and the Low Head SI pumps are vertical, two-stage, centrifugal pumps, with an extended shaft and casing to allow suction from the containment sump. The motor and mechanical seals of the pumps are located at approximately the +12-foot elevation, and the bottom of the casing is located at approximately the -30-foot elevation. The welds identified are at the bottom of the pump casing, and are embedded within the concrete building structure. Hence, the welds are inaccessible from the outside diameter. Examination from the inside surface is not possible due to the size of the casing and interference from the pump shaft.

Relief Request Nos. SR-021, SR-022, SR-027, and SR-028

The welds identified in the relief requests have been examined to the extent practicable in accordance with the Code. Full surface examination coverage could not be achieved due to interference from the support structure and close proximity to the adjacent wall, which render portions of the welds inaccessible. The accessible portions of welds on the pump casings were surface-examined with no indications found.

3.5 PROPOSED ALTERNATIVE EXAMINATION

Relief Request No. SR-004, Rev. 1

A visual examination of the accessible portions of the inside diameter of the pump casing welds will be performed only if the pumps are disassembled.

Relief Request Nos. SR-021, SR-022, SR-027, and SR-028

It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements.

4.0 EVALUATION

The ASME Code, Section XI, 1989 Edition, requires surface examination of 100% of the pump casing welds each inspection interval. However, the examination can be limited to one pump in

the case of multiple pumps of similar design, size, function, and service in a system. The casings of the outside RS and the Low Head SI pumps are embedded in concrete as stated in relief request SR-004 Rev. 1; therefore, they are inaccessible for surface examination from the outside. Further, the size of the pump casing opening precludes surface examination from inside the pump casing. The staff has determined that it is impractical to comply with the Code requirement to perform surface examination of the casing welds. Redesigning and replacing the pumps would impose a significant burden on the licensee if the Code requirements were imposed. Therefore, the licensee has proposed a VT-1 visual examination of the accessible portions of the pump casing welds from inside the casing whenever the pumps are disassembled and the pump shaft removed for maintenance. The staff has determined that the proposed VT-1 visual examination is adequate to detect the most likely degradation mechanism of intergranular stress corrosion or fatigue cracking. Therefore, the staff finds the licensee's proposed alternative provides reasonable assurance of structural integrity of the pump casing welds.

In relief requests SR-021, SR-022, SR-027, and SR-028, the licensee has stated that the Code requirements are impractical due to interference of the adjacent wall and/or the vibration plate on the pump in performing surface examination of the casing welds. The staff has determined that the licensee would be subjected to a significant burden of redesigning and replacing the pumps if the Code requirements were to be imposed. The licensee's proposed alternative of performing a best-effort examination was evaluated by the staff. The surface examination of the accessible portions of the welds resulted in a range of coverage between 57% to 96% with one inaccessible weld in each unit not being examined. The results of the examinations did not identify any unacceptable indication. The staff, therefore, believes that if there were a pattern of service-induced degradation in the pump casing welds, the examination of the accessible portions of the welds would have revealed it. Further, in the highly unlikely event that a service-induced flaw in the weld was not detected and propagates through the thickness, it would most likely be detected during the Code-required VT-2 visual examination during a system pressure test. The staff concludes that there is a reasonable assurance of structural integrity of the casing welds based on the results of examinations conducted on the accessible portions of the welds.

5.0 CONCLUSION

The staff has reviewed the licensee's submittal and concludes that compliance with the Code requirements is impractical for the pump casing welds identified in the licensee's relief requests SR-004 Rev. 1, SR-021, SR-022, SR-027, and SR-028 due to inaccessibility. The staff has further determined that if the Code requirements were to be imposed on the licensee, the pumps must be redesigned, which would impose a significant burden on the licensee. The staff finds that the examination coverages of the accessible weld surfaces provide reasonable assurance of structural integrity of the subject welds. Therefore, relief is granted from the Code requirement pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year ISI interval of Surry, Units 1 and 2. The relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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Date: August 21, 2001

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Surry Power Station

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