

March 17, 2000

Mr. J. P. O'Hanlon  
Senior Vice President - Nuclear  
Virginia Electric and Power Company  
5000 Dominion Blvd.  
Glen Allen, Virginia 23060

SUBJECT: SURRY POWER STATION, UNIT 1 - RELIEF REQUEST NO. SR-020 FOR THE  
THIRD 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NO. MA6190)

Dear Mr. O'Hanlon:

The purpose of this letter is to grant the relief you requested for Surry Power Station, Unit 1, in relief request SR-020 related to your inservice inspection (ISI) programs.

By letter dated July 29, 1999, Virginia Electric and Power Company submitted a request for relief from the American Society of Mechanical Engineers Code, Section XI requirements for ISI at Surry Power Station, Unit 1. Our evaluation and conclusions are contained in the enclosed Safety Evaluation. Your proposed alternative provided in Relief Request SR-020 is authorized pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i) based on determinations that the proposal provides reasonable assurance of structural integrity of the subjected welds, and compliance with the Code would be impractical and cannot be performed to the extent required by the Code at Surry Unit 1.

This concludes our efforts on this issue; therefore, we are closing out TAC No. MA6190.

Sincerely,

*/RA/*

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

Docket No. 50-280

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE THIRD INSERVICE INSPECTION INTERVAL

RELIEF REQUEST NO. SR-020

SURRY POWER STATION, UNIT 1

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

1.0 INTRODUCTION

By letter dated July 29, 1999, Virginia Electric and Power Company (the licensee) submitted a request for relief from the volumetric examination requirement of the American Society of Mechanical Engineers (ASME) Code, Section XI. The information provided by the licensee in support of the request for relief from Code requirements has been evaluated pursuant to the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i) and the basis for disposition is documented below.

2.0 BACKGROUND

Inservice inspection (ISI) of the ASME Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (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 conducted during the first 10-year interval and subsequent intervals comply with the

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requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. For Surry Unit 1 the applicable edition of Section XI of the ASME Code for the third 10-year ISI interval is the 1989 Edition.

### 3.0 LICENSEE'S EVALUATION

The components for which relief is requested:

<u>Weld NO.</u>	<u>Line NO.</u>	<u>Drawing NO.</u>	<u>Class</u>
1-05DM	29"-RC-4-2501R	11448-WMKS-0101AZ-1	1
1-06DM	31"-RC-5-2501R	11448-WMKS-0101AZ-1	1

Welds 1-05DM and 1-06DM are nozzle-to-safe end butt welds on the "B" loop steam generator (hot and cold legs, respectively) reactor coolant piping.

Applicable ASME Section XI Code (1989 Edition) requirement from which relief is requested:

The 1989 Edition of ASME Section XI Table IWB-2500-1, examination category B-F, item number B5.70 requires an outside diameter surface examination of the weld and adjacent base metal and a volumetric examination of the weld and adjacent base metal (interior one-third volume) as defined by Figure IWB-2500-8. The Code does not allow any limitations to the required volumetric or surface examinations. Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds, allows a reduction in coverage, if it is less than 10 percent.

Relief is requested from fully performing the Code-required volumetric examination on the above-identified reactor coolant piping welds.

Licensee's Basis for Requesting Relief and Justification for Granting Relief (as stated):

The components listed above have been examined to the extent practical as required by the Code. However, due to the configuration of the weld (proximity to nozzles and elbows), full volumetric coverage could not be achieved in the axial direction...

The material on the elbow side of the joint is centrifugally cast stainless steel which requires a large, dual element, longitudinal wave search unit. A centrifugally cast stainless steel calibration block is also used. A smaller transducer or a shear wave transducer would not provide adequate calibration or adequate penetration into the material. Due to the cladding on the nozzle and the base material of the elbow, as well as the geometry and ultrasound node, the use of a multi-leg inspection technique was not possible.

100% of the welds in this Category and item number are scheduled for examination. Therefore, substitution with other welds is not feasible.

Licensee's Proposed Alternative (as stated):

The examination performed at reduced coverage is proposed to be fully acceptable to meet the Code requirements. In addition:

- 1) A visual (VT-2) examination will be performed during the normally scheduled leakage test each refueling outage.
- 2) Technical Specifications require that the reactor coolant system leak rate be limited to one gallon per minute unidentified leakage. This value is calculated daily.
- 3) The containment atmospheric particulate radioactivity is checked every 12 hours as an early indicator of RCS [reactor coolant system] leakage.

The proposed alternate examination will ensure that the overall level of plant quality and safety will not be compromised.

4.0 STAFF EVALUATION

The 1989 Edition of ASME Code Section XI Table IWB-2500-1, examination category B-F, Item Number B5.70 requires 100% volumetric examination of the weld and adjacent base metal (interior one-third volume) as defined by Figure IWB-2500-8 on steam generators. Complete examination coverage of the subject welds at Surry Unit 1 is restricted due to the geometrical configuration of the nozzles and the proximity of the welds to the pipe elbows. Also, the material on the elbow side of the weld is centrifugally cast stainless steel. This material is highly attenuative and requires a large transducer to insonify. The configuration of inlet nozzle weld no. 1-05DM and outlet nozzle weld no. 1-06DM on the "B" steam generator prevented scanning from the nozzle side (obtained 0%) and prevented full scanning from the elbow side (obtained 65% on weld 1-05DM and 73% on weld 1-06DM) of the axial scans. For both welds, 100% coverage was obtained for the circumferential scans. The four directions of the ultrasonic test examination yielded an average volumetric coverage of 66% for weld 1-05DM and 68% coverage for weld 1-06DM. The use of alternate angles would not have improved the coverage of the axial scans. Gaining additional access for examination of the subject welds would require design modifications. Imposition of this requirement would impose a significant burden on the licensee.

The staff determined that the licensee has volumetrically examined the subject welds to the extent practical. Based on the limited ultrasonic examinations performed on the subject welds, the complete 100% surface examinations on the welds, and the licensee's monitoring and tests for leakage, the staff finds that reasonable assurance of structural integrity of the subject welds has been provided. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

## 5.0 CONCLUSION

The staff concludes that the subject inservice examinations are impractical and cannot be performed to the extent required by the Code at Surry Unit 1. The licensee's proposed alternatives provide reasonable assurance of structural integrity of the subject welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for Relief Request SR-020.

Principal Contributor: A. Keim

Date: March 17, 2000

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Surry Power Station

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