

August 1, 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: INSERVICE INSPECTION (ISI)
PROGRAM RELIEF REQUESTS RR 14 (UNIT 1) AND RR 8 (UNIT 2) (TAC NOS.
MB1083 AND MB1084)

Dear Mr. Christian:

This letter grants the relief you requested from the requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI. The relief provides for an alternative to: (a) a visual (VT-2) examination of reactor vessel partial penetration welds during the system hydrostatic test; and (b) a visual (VT-2) examination of the bottom of the reactor vessel during a system leakage test and during the system hydrostatic test.

By letter dated January 18, 2001, Virginia Electric and Power Company (VEPCO) proposed relief from the requirements of the ASME Code, Section XI, Table IWB-2500-1, Category B-E, Item No. 4.10, which requires reactor vessel partial penetration welds to have a visual (VT-2) examination during the system hydrostatic test of IWB-5222. In addition, relief was requested from the requirements of Category B-P, Item Nos. B15.10 and B15.11, which require a visual (VT-2) examination of the bottom of the reactor vessel during the system leakage test of IWB-5221 and during the system hydrostatic test of IWB-5222.

Our evaluation and conclusion are contained in the enclosed Safety Evaluation. We conclude that performance of the VT-2 examinations during the hydrostatic test and the system leakage test would require the examiner to wear self-contained breathing apparatus that limits his work duration and mobility, and the examiner must also contend with high ambient temperatures. Your proposed alternative examination will provide a reasonable assurance of leaktight integrity of the reactor vessel bottom head, including the instrumentation nozzle partial penetration welds. Imposition of the examination requirements would cause a considerable burden on the licensee without a compensating increase in the level of quality and safety. The relief you requested is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval for Surry, Units 1 and 2.

D. A. Christian

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The staff has completed its evaluation of this request; therefore, we are closing TAC Nos. MB1083 and MB1084.

Sincerely,

/RA/

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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/RA/

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Surry Power Station

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL REQUESTS FOR RELIEF NOS. RR-14 AND RR-8

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 January 18, 2001, Virginia Electric and Power Company, the licensee, requested relief from the Code-required VT-2 visual examination of the pressure-retaining surfaces, including the instrument nozzle partial penetration welds on the reactor vessel bottom head, during performance of system leakage tests and the system hydrostatic test for the third 10-year inspection interval of Surry, Units 1 and 2. The licensee stated that the performance of the VT-2 visual examination of the bottom of the reactor vessel during a system pressure test while the primary containment is maintained at subatmospheric pressure conditions causes unusual difficulty due to access limitations, adverse environmental conditions, and the need to use self-contained breathing apparatus.

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 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). 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 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

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the limitations and modifications listed therein. The applicable ISI Code of Record for the third 10-year ISI interval of Surry Power Station, Units 1 and 2, is the 1989 Edition of ASME Section XI.

3.0 DISCUSSION

3.1 Identification of Components

System: Reactor Coolant (RC)

Components: Pressure-retaining surfaces including Partial Penetration Welds on Instrument Nozzles on the Reactor Vessel Bottom Head

Code Class: 1

3.2 Code Requirements

The 1989 Edition of ASME Section XI, Table IWB-2500-1, Examination Category B-E, Item Number B4.10, requires reactor vessel partial penetration welds to have a visual (VT-2) examination during the system hydrostatic test of IWB-5222. In addition, Category B-P, Item Nos. B15.10 and B15.11, requires a visual (VT-2) examination of the bottom of the reactor vessel during the system leakage test of IWB-5221 and during the system hydrostatic test of IWB-5222, respectively.

3.3 Code Requirements from Which Relief Is Requested

Relief is requested from performing the Code-required visual (VT-2) examination of the reactor vessel bottom head during system leakage and hydrostatic tests.

3.4 Proposed Alternative

“A VT-2 examination will be conducted each refueling when the reactor containment is at atmospheric conditions for evidence of boric acid corrosion. Further, Technical Specifications require that the reactor coolant system leak rate be limited to 1 gallon per minute unidentified leakage, and this value is calculated at least daily. Additionally, containment atmosphere particulate radioactivity is monitored continuously, and the incore sump room has a level alarm in the control room that is typically available and requires operator action in the event an alarm is received. These provisions would adequately identify any integrity concerns associated with this area (i.e., the bottom of the reactor vessel).”

3.5 Licensee's Basis for Alternative

“In order to meet the Section XI pressure and temperature requirements for the system leakage and system hydrostatic tests of the reactor vessel, the Surry [Units 1 and 2] reactor containment is required to be at subatmospheric pressure. Station administrative procedures require that self-contained breathing apparatus must be worn for containment entries under these conditions. This requirement significantly complicates the visual (VT-2) examination of the bottom of the reactor vessel during testing. Access to the bottom of the reactor vessel requires that the examiner descend several levels to a ladder in the residual heat removal pump area. In addition to these physical constraints, the examiner must contend with adverse

environmental conditions including elevated air temperatures due to reactor coolant temperatures above 500 degrees F and limited air circulation in the vessel cubicle. Further, the examiner is limited by the approximate 45-minute capacity of the breathing apparatus for containment entry, the VT-2 examination, and containment exit.”

4.0 EVALUATION

The staff has reviewed the information concerning the ISI program Requests for Relief RR-14 and RR-8 submitted in the licensee’s letter dated January 18, 2001, for the third 10-year ISI interval of Surry, Units 1 and 2, pertaining to visual VT-2 examinations of the bottom of the reactor vessel, including examination of the instrumentation nozzle partial penetration welds. The Code requires that these examinations be conducted during each hydrostatic test and system leakage test of the reactor coolant system. Since the containment building is at subatmospheric condition during the hydrostatic test and the system leakage test, the examiner must wear self-contained breathing apparatus that limits his work duration and mobility. In addition to these physical constraints, the examiner must contend with high ambient temperatures. Thus, imposition of the examination requirements would cause a considerable burden on the licensee.

The licensee proposed, as an alternative, to perform a VT-2 visual examination for evidence of boric acid corrosion when the containment is at atmospheric condition during refueling. In addition, the licensee noted that the Technical Specifications require monitoring of reactor coolant leak rate, atmospheric particulate radioactivity, and containment sump level. The staff believes that the boric acid corrosion inspection performed at the end of the fuel cycle is in itself a reliable inspection for reactor coolant leakage, and the VT-2 visual examination for evidence of boric acid corrosion conducted during each refueling outage would, therefore, provide a reasonable assurance of leaktight integrity. The staff also believes that the licensee-proposed alternative will provide reasonable assurance that unallowable inservice leaks, if developed at the bottom of reactor vessel, will be detected for appropriate corrective action prior to return of the vessel back to service. The staff has, therefore, determined that the Code-required examinations at the bottom of the reactor vessel during system leakage and hydrostatic tests would result in hardship without a compensating increase in the level of quality and safety.

5.0 CONCLUSION

The staff has reviewed the licensee’s submittal and concludes that performance of the Code-required VT-2 visual examination of the bottom of the reactor vessel during the hydrostatic test and the system leakage test when the containment is at subatmospheric condition would result in hardship to the licensee without a compensating increase in the level of quality and safety. The staff further concludes that the licensee’s proposed alternative examination would provide a reasonable assurance of leaktight integrity of the reactor vessel bottom head, including the instrumentation nozzle partial penetration welds. Therefore, the alternative examination in Requests for Relief Nos. RR-14 and RR-8 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval for Surry, Units 1 and 2.

Principal Contributor: P. Patnaik

Date: August 1, 2001