



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

August 27, 2013

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Blvd.  
Glenn Allen, VA 23060

SUBJECT: SURRY POWER STATION, UNIT NOS 1 AND 2 - RELIEF FROM THE  
REQUIREMENTS OF THE ASME CODE (TAC NOS. MF1805 AND MF1806)

Dear Mr. Heacock:

By letter dated May 1, 2013, with supplement dated June 24, 2013, Virginia Electric and Power Company (Dominion) submitted for Nuclear Regulatory Commission (NRC) review and approval a request to use a subsequent edition and addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, for the inservice inspection (ISI) of Examination Categories B-L-1 and C-B components in the fourth ten-year ISI interval at Surry Power Station, Units 1 and 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 10 CFR 50.55a(g)(4)(iv), the licensee requested to use later code editions and addenda for in-service testing items subject to the limitations and modifications listed in 10 CFR 50.55a(b).

The NRC staff determines that the use of the 2007 Edition with 2008 Addenda of the ASME Code, Section XI for the affected components acceptable because Dominion has satisfied the criteria in 10 CFR 50.55a(g)(4)(iv). Accordingly, the NRC staff concludes that Dominion has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(4)(iv) and is in compliance with the requirements of the ASME Code, Section XI. Therefore, the NRC staff approves the use of the 2007 Edition with the 2008 Addenda of the ASME Code, Section XI, for the ISI of reactor coolant pump casing welds and for paragraph IWC-3511 for the ISI of the reinforcing plate welds to nozzles and vessel(s) of the residual heat removal heat exchanger (Examination Category C-B, Item number C2.31) for the remainder of the fourth 10-year ISI interval at Unit 1, which is scheduled to end December 13, 2013 (after the fall 2013 refueling outage), and at Unit 2, which is scheduled to end May 9, 2014.

D. Heacock

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If you have any questions, please contact the Project Manager, Karen Cotton at 301-415-1438 or via e-mail at karen.cotton@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Pascarelli". The signature is fluid and cursive, with a large initial "R" and a long, sweeping underline.

Robert Pascarelli, 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

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST TO USE SUBSEQUENT EDITION OF ASME CODE

VIRGINIA ELECTRIC AND POWER COMPANY SURRY POWER STATION UNITS 1 AND 2

DOCKET NUMBER 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated May 1, 2013 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML13136A134), with supplement dated June 24, 2013 (ADAMS Accession No. ML13182A080), Virginia Electric and Power Company (Dominion) submitted for Nuclear Regulatory Commission (NRC) review and approval a request to use a subsequent edition and addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, for the inservice inspection (ISI) of Examination Categories B-L-1 and C-B components in the fourth ten-year ISI interval at Surry Power Station, Units 1 and 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(4)(iv), Dominion requested to use the 2007 Edition with the 2008 Addenda of the ASME Code, Section XI, for the ISI of reactor coolant pump (RCP) casing welds and reinforcement plate welds to nozzles and vessel(s) of the residual heat removal (RHR) heat exchanger.

2.0 REGULATORY EVALUATION

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 pre-service 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. Section 10 CFR 50.55a(g)(4)(ii) requires that ISI examinations of components and system pressure tests conducted during successive 120 month inspection intervals must comply with the requirements in the latest edition and addenda of Section XI of 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 conditions listed therein.

Section 10 CFR 50.55a(g)(4)(iv) states that inservice examination of components and system pressure tests may meet the requirements set forth in subsequent editions and addenda of the ASME Code provided that they are incorporated by reference in 10 CFR 50.55a(b), subject to the conditions listed in 10 CFR 50.55a(b), and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective

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editions or addenda are met. Currently, Section 10 CFR 50.55a(b)(2) incorporates by reference the ASME Code Section XI from the 1970 Edition through the 1976 Winter Addenda, and the 1977 Edition through the 2007 Edition with the 2008 Addenda.

Based on the above analysis, the NRC staff finds that it has the regulatory authority to authorize the use of a subsequent edition and addenda of the ASME Code, as requested by Dominion.

### 3.0 DOMINION'S REQUEST

The code of record for the current fourth 10-year ISI interval at Surry, Units 1 and 2, is the 1998 Edition with the 2000 Addenda of the ASME Code, Section XI. Dominion proposed to use the 2007 Edition with the 2008 Addenda of the ASME Code, Section XI, for the ISI of RCP casing welds (Examination Category B-L-1) and for Paragraph IWC-3511 in its entirety and with all associated references for the ISI of the reinforcing plate welds to nozzles and vessel(s) of the RHR heat exchanger (Examination Category C-B, Item Number C2.31) in the fourth 10-year ISI interval for Surry, Units 1 and 2.

Dominion stated that ASME removed Examination Category B-L-1 welds from the ASME Code Section XI, 2007 Edition with 2008 Addenda because industry operating experience has not identified any failures in RCP casings. According to Dominion, examining the RCP casing welds results in unnecessary radiation exposure for non-destructive examination personnel.

Dominion further stated that flaw acceptance standards for Class 2 austenitic pressure retaining welds of nozzles in vessels (Examination Category C-B, Item number C2.31) exists in IWC-3511, "Standards for Examination Category C-B, Pressure Retaining Welds of Nozzles In Vessels," of the 2007 Edition with the 2008 Addenda, by referring to Table IWB-3514.2. Dominion noted that the current code of record does not contain the flaw acceptance criteria for Examination Category C-B components (e.g., RHR heat exchanger welds).

Dominion proposed that the request be applicable for the remainder of the fourth 10-year ISI interval for Unit 1, which is scheduled to end on December 13, 2013 (after the fall 2013 refueling outage), and for Unit 2, which is scheduled to end on May 9, 2014.

### 4.0 NRC STAFF EVALUATION

The NRC staff evaluated Dominion's request using the criteria contained in 10 CFR 50.55a(g)(4)(iv), which states that inservice examination of components and system pressure tests may meet the requirements set forth in subsequent editions and addenda of the ASME Code provided certain criteria are satisfied.

The first criterion is that the edition and addenda of the ASME Code, Section XI that will be used in the proposed request is incorporated by reference in 10 CFR 50.55a(b). Currently, the latest edition and addenda incorporated by reference in Section 10 CFR 50.55a(b)(2) is the 2007 Edition with the 2008 Addenda, which Dominion proposed to use for the two affected components. Therefore, the NRC finds that Dominion has satisfied the first criterion.

The second criterion is that the conditions listed in 10 CFR 50.55a(b) are satisfied for the specific use of the proposed subsequent edition and addenda of the ASME Code, Section XI.

The NRC staff noted that 10 CFR 50.55a(b) sets no conditions on Examination Categories B-L-1 and C-B of the 2007 Edition with the 2008 Addenda of the ASME Code, Section XI. Therefore, the NRC staff finds that Dominion has satisfied the second criterion.

The third criterion is that if portions of subsequent editions or addenda of the ASME Code, Section XI are used, all related requirements of the respective editions or addenda must be met. The NRC staff evaluated Dominion's Request with respect to the third criterion as follows:

The NRC staff noted that Table IWB-2500-1 of the 1998 Edition to the 2007 Edition of the ASME Code, Section XI, provides examination requirements for Examination Category B-L-1, Item B12.10, such as RCP casing welds. However, starting in the 2008 Addenda, Table IWB-2500-1 no longer includes Examination Category B-L-1 components and any associated examination requirements. The NRC staff confirmed that the Examination Category B-L-1 components have been removed from Table IWB-2500-1 of the 2008 Addenda. Dominion stated that the removal was because the industry experience has not identified any failures in RCP casings and that performing visual examinations of the RCP casing welds will expose personnel to unnecessary radiological dose.

The NRC staff noted that although the RCP pump casing welds are not required to be examined by Table IWB-2500-1 of the 2008 addenda, the internal surface of the RCP pump casing (Examination Category B-L-2) is required to be examined visually. The NRC staff believes that the examiner will most likely notice any flaws on the surface of the RCP casing welds while the casing is being inspected. In addition, the pump casing welds are made of austenitic stainless steel which is less susceptible to stress corrosion cracking than other weld filler material. The NRC has approved the use of the 2008 Addenda of the Code; therefore, the NRC staff finds that Dominion's request of using 2008 Addenda for ISI of the RCP casing welds is acceptable.

The NRC staff noted that the current code of record (the 1998 Edition with the 2000 Addenda) does not contain the acceptance criteria for the Examination Category C-B, Item number C2.31 components (e.g., the reinforcing plate welds to nozzles and vessel(s) of the RHR heat exchanger). The NRC staff confirmed that the 2007 Edition contains the acceptance criteria for the Examination Category C-B components because paragraph IWC-3511.1(b) of IWC-3511, "Standards for Examination Category C-B. Pressure Retaining Welds of Nozzles in Vessels," states that "...For austenitic steels, the standards are in the course of preparation; the acceptance standards of Table IWB-3514-2 may be used..." The NRC staff finds that by adopting the 2007 Edition of the ASME Code, Section XI, Dominion will be able to use the acceptance standards of Table IWB-3514-2 to disposition the inspection results of the reinforcement plate welds to the nozzles and vessel(s) of the RHR heat exchanger. In addition, Dominion stated that it will use the 2007 edition with the 2008 addenda for the examination of RCP casing welds (Examination Category B-L-1) and for paragraph IWC-3511 in its entirety and with all associated references with respect to the examination of the reinforcing plate welds to nozzles and vessel(s) of the RHR heat exchanger (Examination Category C-B, Item number C2.31). Therefore, the NRC staff finds the adoption of the 2007 Edition with the 2008 Addenda for the ISI of the reinforcing plate welds to the nozzles and vessel(s) of the RHR heat exchanger is acceptable.

The NRC staff determines that Dominion has identified all related requirements of 2007 Edition with 2008 Addenda of the ASME Code, Section XI for the ISI of the RCP casing welds and

reinforcing plate welds to the nozzles and vessel(s) of the RHR heat exchanger and plans to satisfy those requirements. Therefore, the NRC staff finds that Dominion has satisfied the third criterion.

Based on the above, the NRC staff finds that Dominion has satisfied the three criteria of 10 CFR 50.55a(g)(4)(iv) in its request to use the 2007 Edition with 2008 Addenda of the ASME Code Section XI for the ISI of the RCP casing welds and the reinforcing plate welds to nozzles and vessel(s) of the RHR heat exchanger.

## 5.0 CONCLUSION

As set forth above, the NRC staff determines that the use of the 2007 Edition with 2008 Addenda of the ASME Code, Section XI for the affected components acceptable because Dominion has satisfied the criteria in 10 CFR 50.55a(g)(4)(iv). Accordingly, the NRC staff concludes that Dominion has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(4)(iv) and is in compliance with the requirements of the ASME Code, Section XI. Therefore, the NRC staff approves the use of the 2007 Edition with the 2008 Addenda of the ASME Code, Section XI, for the ISI of RCP casing welds and for paragraph IWC-3511 for the ISI of the reinforcing plate welds to nozzles and vessel(s) of the RHR heat exchanger (Examination Category C-B, Item number C2.31) for the remainder of the fourth 10-year ISI interval at Unit 1, which is scheduled to end December 13, 2013 (after the fall 2013 refueling outage), and at Unit 2, which is scheduled to end May 9, 2014.

Principal Contributor: John Tsao

Date: August 27, 2013

D. Heacock

- 2 -

If you have any questions, please contact the Project Manager, Karen Cotton at 301-415-1438 or via e-mail at karen.cotton@nrc.gov.

Sincerely,

**/RA/**

Robert Pascarelli, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos: 50-280 and 50-281

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Safety Evaluation

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