

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

November 20, 1995

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

Serial No. 95-270A  
NL&OS/JBL R3  
Docket Nos. 50-280  
50-281  
50-338  
50-339  
License Nos. DPR-32  
DPR-37  
NPF-4  
NPF-7

Gentlemen:

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**SURRY POWER STATION UNITS 1 AND 2**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**SIX-MONTH RESPONSE TO GENERIC LETTER 92-01, REV. 1, SUPPL. 1**  
**REACTOR VESSEL STRUCTURAL INTEGRITY**

NRC Generic Letter 92-01, Revision 1, Supplement 1, entitled "Reactor Vessel Structural Integrity," was issued on May 19, 1995. The NRC issued this supplement to require licensees to identify, collect, and report any new data pertinent to analysis of the structural integrity of their reactor pressure vessels (RPVs). Licensees were also requested to assess the impact of pertinent data on their RPV integrity analyses relative to the requirements of 10 CFR 50.60, 10 CFR 50.61, and Appendices G and H to 10 CFR 50, including any potential impact on low-temperature overpressure protection (LTOP) limits or pressure-temperature (P-T) limits.

By letter dated August 10, 1995, Virginia Electric and Power Company provided the required 90-day response to the generic letter, Part (1), for Surry Units 1 and 2 and North Anna Units 1 and 2. That submittal delineated the actions taken and the actions planned to locate data relevant to the determination of RPV integrity.

The six-month responses to the generic letter, Parts (2), (3), and (4), for Surry Units 1 and 2 and North Anna Units 1 and 2 are documented in technical reports BAW-2257, Revision 1, "B&W Owners Group Reactor Vessel Working Group Response to Generic Letter 92-01, Revision 1, Supplement 1," dated October 1995, and BAW-2260, "Response to Generic Letter 92-01, Revision 1, Supplement 1, for Virginia Power's North Anna Units 1 and 2 Beltline Materials and Surry Units 1 and 2 Rotterdam

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Beltline Weld Metals," dated October 1995. Although the best-estimate copper and nickel concentrations for several beltline materials have changed as a result of newly acquired data, these materials have been demonstrated to remain in compliance with applicable regulatory requirements.

A summary of the findings in these two reports is provided as Attachment 1 to this letter. B&W report BAW-2260 is provided as Attachment 2 to this letter. B&W report BAW-2257, Revision 1, was transmitted separately to the NRC by B&W Owners Group (B&WOG) letter OG-95-1552, dated November 1, 1995.

If you have any further questions, please contact us.

Very truly yours,



James P. O'Hanlon  
Senior Vice President - Nuclear

Attachments

cc: U.S. Nuclear Regulatory Commission  
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COMMONWEALTH OF VIRGINIA )  
 )  
COUNTY OF HENRICO )

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by J. P. O'Hanlon, who is Senior Vice President - Nuclear, of Virginia Electric and Power Company. He is duly authorized to execute and file the foregoing document in behalf of that Company, and the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 20<sup>TH</sup> day of November, 1995.  
My Commission Expires: May 31, 1998.

*Vicki L. Hull*  
Notary Public

(SEAL)

**Attachment 1**

**Summary of Six-Month Response to  
NRC Generic Letter 92-01, Revision 1, Supplement 1,  
Reactor Vessel Structural Integrity**

**for**

**North Anna Units 1 and 2  
Surry Units 1 and 2**

**Virginia Electric and Power Company**

## Attachment 1

### Summary of Six-Month Response to NRC Generic Letter 92-01, Revision 1, Supplement 1, Reactor Vessel Structural Integrity

#### North Anna Units 1 and 2 Welds, Plates, and Forgings Surry Units 1 and 2 Rotterdam Welds

The North Anna Units 1 and 2 reactor vessels, as well as portions of the Surry Units 1 and 2 reactor vessels, were fabricated by the Rotterdam Dockyard Company. The response to Generic Letter 92-01, Revision 1, Supplement 1, for these portions of the North Anna Units 1 and 2 and Surry Units 1 and 2 reactor vessels is provided in Babcock & Wilcox (B&W) report BAW-2260, "Response to Generic Letter 92-01, Revision 1, Supplement 1, for Virginia Power's North Anna Units 1 and 2 Beltline Materials and Surry Units 1 and 2 Rotterdam Beltline Weld Metals," dated October 1995. As indicated in this report, the best-estimate copper and nickel concentrations for several beltline materials have changed as a result of newly acquired data. These changes are summarized in Section 2 of BAW-2260. With the exception of the Pressurized Thermal Shock (PTS) evaluation for North Anna Unit 1 and the Upper Shelf Energy (USE) evaluations for North Anna Units 1 and 2, the reactor pressure vessel integrity evaluations which demonstrate compliance with 10 CFR 50.60, 10 CFR 50.61, 10 CFR 50 Appendix G, or 10 CFR 50 Appendix H are not adversely impacted by the changes in best-estimate chemical composition.

The North Anna Units 1 and 2 lower shell forgings were previously identified to be the limiting materials with respect to PTS concerns. The limiting material determination was based on the relative margin between the calculated 10 CFR 50.61 PTS reference temperature and the applicable screening criterion, and did not take credit for available surveillance data. After consideration of the new chemical composition data, and without consideration of available surveillance data, the lower shell forgings remain the limiting North Anna Units 1 and 2 beltline materials with respect to PTS concerns. The calculated end-of-license PTS reference temperature for North Anna Unit 1 lower shell forging is increased from 227.7°F to 238.9°F. This value is well below the screening criterion of 270°F. If available surveillance data for North Anna Unit 1 lower shell forging is considered, the chemistry factor and, hence, the predicted embrittlement for this material would be significantly reduced. The calculated end-of-license PTS reference temperature for North Anna Unit 2 lower shell forging is unchanged because no new data is available for Unit 2. It is concluded that the

chemical composition changes do not cause the calculated PTS reference temperatures to exceed the applicable PTS screening criterion.

Regulatory Guide 1.99, Revision 2 models the percent drop in USE as a function of fluence and mean copper content only. Because the mean copper concentrations for several North Anna beltline materials have increased, the calculated end-of-license USE values for these materials have decreased. However, after consideration of the revised copper concentrations, the end-of-license USE values at the 1/4-T location remain above the 50 ft-lb level. Moreover, the equivalent margin analyses prepared by Westinghouse and Babcock & Wilcox remain available to demonstrate acceptable fracture toughness for these materials should their calculated values of USE drop below 50 ft-lb.

For the remaining North Anna Units 1 and 2 beltline materials, and the Surry Units 1 and 2 Rotterdam weld materials, the limiting material selection, and the evaluations which demonstrate compliance with applicable regulations for these limiting materials, are not adversely affected by the newly acquired data. Application of the Regulatory Guide 1.99, Revision 2, Position 2.1 ratio procedure would result in lower applied chemistry factors, since the calculated chemistry factor based on mean copper and nickel concentrations for the surveillance material would be greater in all instances than the calculated chemistry factor based on mean copper and nickel concentrations for the corresponding beltline material. (See Tables 2-1 through 2-4 of BAW-2260. Surveillance material chemical compositions are presented in bold typeface. The beltline material mean copper and nickel concentrations are based on both surveillance data and material certification test report data.)

Revised input for the NRC's Reactor Vessel Integrity Database (RVID) is presented in Appendix A of BAW-2260. Shaded values are unchanged from those previously submitted in BAW-2224, "North Anna Units 1 and 2 Response to Closure Letter for NRC Generic Letter 92-01, Revision 1," dated July 1994, and BAW-2222, "Reactor Vessel Working Group Response to Closure Letters to NRC Generic Letter 92-01, Revision 1," dated June 1994.

The data presented in BAW-2260 is submitted as the revised basis for demonstrating compliance with 10 CFR 50.61 (pressurized thermal shock) and 10 CFR 50 Appendix G (upper shelf energy).

### Surry Units 1 and 2 Linde 80 Welds, Plates, and Forgings

The portions of the Surry Units 1 and 2 reactor vessel that were not fabricated by Rotterdam Dockyard Company were fabricated by B&W. The response to Generic Letter 92-01, Revision 1, Supplement 1, for the B&W-fabricated portions of the Surry Units 1 and 2 reactor vessels (i.e., Linde 80 welds, plates, and forgings) is included in B&W Report BAW-2257, Revision 1, dated October 1995. This report was transmitted separately to the NRC by B&W Owners Group (B&WOG) letter OG-95-1552, dated November 1, 1995. This report indicates:

- (1) A review of all available data has been performed for the Linde 80 welds.
- (2) There are no changes to the previously reported Linde 80 weld metal chemistry values for the Surry Units 1 and 2 Linde 80 welds, plates, and forgings.
- (3) There is no need to apply the ratio procedure as described in Position 2.1 of Regulatory Guide 1.99, Revision 2, to compensate for differences in beltline and surveillance material chemical composition in Surry Units 1 and 2.
- (4) The previously submitted reactor vessel integrity evaluations for Surry Units 1 and 2 Linde 80 welds, plates, and forgings remain valid.

The evaluation documented in BAW-2257, Revision 1, concludes that no revisions to previously submitted RPV integrity evaluations are needed in response to NRC Generic Letter 92-01, Revision 1, Supplement 1, for the Surry Units 1 and 2 reactor vessels. Virginia Electric and Power Company confirms that the docketed bases for the operating pressure-temperature (P-T) operating limits, low-temperature overpressure protection (LTOP) setpoints, and the pressurized thermal shock reference temperatures (RTPTS) for Surry Units 1 and 2 are equivalent to, or bound, the information and findings contained in BAW-2257, Revision 1. Therefore, no changes to the previously submitted bases are required.

**Attachment 2**

**B&W Report, BAW-2260**

**Response to Generic Letter 92-01, Revision 1, Supplement 1, for  
Virginia Power's North Anna Units 1 and 2 Beltline Materials and  
Surry Units 1 and 2 Rotterdam Beltline Weld Metals**

**Virginia Electric and Power Company**