

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

March 14, 1995

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

Serial No. 95-032  
NL&P/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**  
**WESTINGHOUSE ALLOY 600 THERMALLY TREATED**  
**MECHANICAL STEAM GENERATOR TUBE PLUGS**

In December 1994, Virginia Electric and Power Company was notified by Westinghouse Electric Corporation of recent field experience with their Alloy 600 thermally treated (TT) mechanical steam generator tube plugs that would necessitate a revision to the corrosion algorithm presented in WCAP-12244, Revision 3, "Steam Generator Tube Plug Integrity Summary Report." By letter dated January 27, 1995, Westinghouse issued Addendum 3 to Revision 3 of WCAP-12245 (this is the non-proprietary version of WCAP-12244), "Addendum 3 to Steam Generator Tube Plug Integrity Summary Report," dated January 1995, which contains the revised mechanical plug corrosion algorithm. This revision to the Westinghouse mechanical plug corrosion algorithm requires an update to our response to NRC Bulletin 89-01, Supplement 2, for Surry and North Anna Power Stations.

By letter dated August 23, 1991, Virginia Electric and Power Company submitted a response to NRC Bulletin 89-01, Supplement 2, "Failure of Westinghouse Steam Generator Tube Mechanical Plugs," dated June 28, 1991, providing an action plan and schedule for the replacement of the Alloy 600 mechanical plugs remaining in service at Surry and North Anna. The attachment to this letter provides the revised action plan and schedule for Surry and North Anna addressing the revision to the Alloy 600 mechanical plug corrosion algorithm for the plugs remaining in service. The revised action plan and schedule supersedes the plan submitted in response to NRC Bulletin 89-01 and its supplements for Surry and North Anna.

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Consistent with the requirements of NRC Bulletin 89-01, the attached information is submitted pursuant to 10 CFR 50.54(f). This information is provided under oath and the statements in this document are true and correct to the best of my knowledge and belief.

Should you have any questions, please contact us.

Very truly yours,



James P. O'Hanlon  
Senior Vice President - Nuclear

Attachment

cc: U.S. Nuclear Regulatory Commission  
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Mr. M. W. Branch  
NRC Senior Resident Inspector  
Surry Power Station

Mr. R. D. McWhorter  
NRC Senior Resident Inspector  
North Anna Power Station



## Attachment

### **Report on Westinghouse Alloy 600 Steam Generator Tube Mechanical Plugs Installed at Surry and North Anna Power Stations**

#### Introduction / Background

By letter dated August 23, 1991 (Serial No. 91-438), Virginia Electric and Power Company (Virginia Power) responded to NRC Bulletin 89-01, Supplement 2, "Failure of Westinghouse Steam Generator Tube Mechanical Plugs," dated June 28, 1991. The response provided the action plan and schedule for replacement of the Alloy 600 mechanical plugs remaining in service at Surry and North Anna Power Stations. By letter dated September 30, 1991, the NRC responded finding the planned actions acceptable for resolution of NRC Bulletin 89-01, Supplement 2, for Surry and North Anna.

In December 1994, Virginia Power was notified by Westinghouse of recent field experience with Alloy 600 thermally treated (TT) mechanical plugs manufactured from heat number NX-2387 that would necessitate a revision to the corrosion algorithm presented in WCAP-12244, Revision 3, "Steam Generator Tube Plug Integrity Summary Report." It was further explained that the revision to the corrosion algorithm may affect the previously developed schedule and action plans for addressing the Alloy 600 TT mechanical plugs remaining in service in the Surry and North Anna steam generators.

On December 22, 1994, Westinghouse and industry representatives met with the NRC to address the status of the Westinghouse Alloy 600 TT steam generator mechanical tube plugs. At the meeting, the NRC encouraged Westinghouse to work with the utility members of the Westinghouse Owners Group (WOG) to address and resolve the NRC's concern involving the most recent occurrence of mechanical plug cracking. By letter dated December 30, 1994, the WOG recommended its utility members provide a letter to the NRC submitting the status of Alloy 600 TT mechanical plugs remaining in service.

By letter dated February 2, 1995, Westinghouse provided Addendum 3 to Revision 3 of WCAP-12245 (this is the non-proprietary version of WCAP-12244), "Addendum 3 to Steam Generator Tube Plug Integrity Summary Report," dated January 1995, which contains the revised mechanical plug corrosion algorithm. The impact of the revised algorithm on the planned corrective actions for Surry and North Anna has been evaluated. Consequently, the Surry and North Anna remedial action plans for Alloy 600 mechanical plugs provided in response to NRC Bulletin 89-01 and its supplements have been revised appropriately. The revised action plans are described below.

Virginia Power has determined that this most recent issue does not pose an immediate safety concern for Surry or North Anna Power Stations. The following remedial action plan for Alloy 600 mechanical plugs for Surry Units 1 and 2 is provided for NRC consideration. The scheduled North Anna Unit 2 steam generator replacement will eliminate the Alloy 600 mechanical plugs remaining in service at North Anna Power Station.

Surry Power Station

Table 1, below, provides the general location, plug heat number, and required repair date for the Westinghouse Alloy 600 mechanical plugs installed in the Surry steam generators that have yet to be either repaired or replaced.

For Surry Unit 1, four Alloy 600 plugs remain in tubes on the hot leg side of the steam generators. These plugs are all from Westinghouse heat number NX-2387 and, based on the revised mechanical plug corrosion algorithm, are required to be replaced during the next refueling outage, currently scheduled to begin in September 1995. There are also eight Alloy 600 plugs remaining in service on the cold leg side of the Surry Unit 1 steam generators. These eight cold leg plugs will be replaced prior to the "Required Repair Date" indicated in Table 1.

Only one Alloy 600 mechanical plug remains in the Surry Unit 2 steam generators. This cold leg side plug will be replaced prior to the "Required Repair Date" indicated in Table 1.

During the period of operation until the Alloy 600 mechanical plugs are repaired or replaced, continued safe operation is assured for Surry Units 1 and 2 based on the revised mechanical plug corrosion algorithm and the justification for continued operation (JCO) provided by Westinghouse Electric Corporation in Section 3.0 of WCAP-12244, Revision 3. Based on a review of the current plant configurations, operating conditions, and the remedial action plan discussed herein, Virginia Power has concluded that the Westinghouse JCO is applicable to Surry Units 1 and 2 during the time period from when the calculated plug "Required Repair Dates" may be exceeded to the next scheduled refueling outage.

Table 1 – Westinghouse Alloy 600 Mechanical Plugs at Surry Power Station

Steam Generator	Number of Plugs	HL/CL	Plug Heat Number	Required Repair Date
Surry Unit 1				
A	3	HL	2387	1992
	3	CL	2387	2097
B	1	HL	2387	1992
	1	CL	2387	2097
	2	CL	3962	2010
C	2	CL	3962	2010
Surry Unit 2				
A	1	CL	3962	2010

### North Anna Power Station

The North Anna Unit 1 steam generators were replaced in 1993. There are no Westinghouse Alloy 600 mechanical tube plugs in the new steam generators.

The North Anna Unit 2 steam generators currently have several tubes plugged on the cold leg side with Westinghouse Alloy 600 mechanical plugs. However, the North Anna Unit 2 steam generator replacement is scheduled to begin approximately March 25, 1995. The steam generator replacement will remove the remaining subject plugs from service. Therefore, no further plug repairs or replacements are planned for Unit 2.

For the period of operation until the steam generator replacement outage, continued safe operation is assured for North Anna Unit 2 based on the revised mechanical plug corrosion algorithm and the JCO provided by Westinghouse Electric Corporation in Section 3.0 of WCAP-12244, Revision 3. Based on a review of the current plant configuration and operating conditions, we have concluded that the Westinghouse JCO is applicable to North Anna Unit 2 until the steam generator replacement outage.