

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

February 5, 1997

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

Serial No.	97-029
NAPS/JHL	R4
Docket Nos.	50-338
	50-339
License Nos.	NPF-4
	NPF-7

Gentlemen:

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**INSPECTION REPORT NOS. 50-338/96-12 AND 50-339/96-12**  
**REPLY TO THE NOTICES OF VIOLATION**

We have reviewed your letter of January 6, 1997, which referred to the inspection conducted at North Anna Power Station from November 3, 1996 through December 7, 1996, and the associated Notices of Violation which were reported in Inspection Report Nos. 50-338/96-12 and 50-339/96-12. Our reply to the Notices of Violation is attached.

Section E1.1b of the Inspection Report indicates that the manufacturer's Quality Control inspector identified a discrepancy in the bolts at various column flanges and the bowls for the replacement service water pumps. However, it should be noted that the discrepancy was with the bolt material used in the vendor's seismic analysis report. The service water pump bowl assemblies were constructed with A307 material as required by the Bill of Materials specified by the vendor, but the vendor's seismic analysis report erroneously used an A325 bolt material in its calculation. The discrepancy between the seismic analysis report and the bolt material actually installed in the pump was identified by a Virginia Electric and Power Company vendor surveillance representative. As a result of this clarification to the Inspection Report, it is requested that Notice of Violation B be reconsidered for categorization as a Non-Cited Violation. We believe categorization as a Non-Cited Violation is justified in this case because Virginia Electric and Power Company discovered the discrepancy, a subsequent evaluation for structural adequacy confirmed structural integrity and function, and corrective action has been implemented to prevent recurrence.

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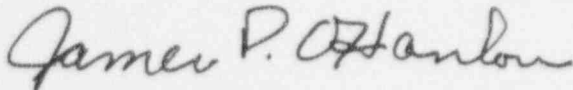
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No new commitments are intended as a result of this letter. If you have any further questions, please contact us.

Very truly yours,

A handwritten signature in cursive script, reading "James P. O'Hanlon".

James P. O'Hanlon  
Senior Vice President - Nuclear

Attachment

cc: U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, N.W.  
Suite 2900  
Atlanta, Georgia 30323

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

**REPLY TO NOTICE OF VIOLATION**  
**INSPECTION REPORT NOS. 50-338/96-12 AND 50-339/96-12**

**NRC COMMENT**

During an NRC inspection conducted on November 3, 1996 through December 7, 1996, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG 1600, the violations are listed below:

- A. 10 CFR 50, Appendix B, Criterion III, and the licensee's accepted Quality Assurance Program (Updated Final Safety Analysis Report, Section 17.2.3) require the licensee to establish measures to ensure that applicable regulatory requirements for the design basis described in licensee documents be implemented.

Contrary to the above, although measures were established, they were inadequate. Since early in plant life until May 1996, the licensee failed to ensure that safeguards area walls met the design basis for containing pump seal leakage as described in Updated Final Safety Analysis Report, Section 15.4.1.8. Specifically, a hole existed between the Unit 2 safeguards area and the Unit 2 quench spray area where the design required that the safeguards area be fully separated. Additionally, holes designed to exist between pump cubicles and the safeguards area sump were plugged, where the design required the proper drainage of pump seal leakage.

This is a Severity Level IV violation (Supplement I).

- B. 10 CFR 50, Appendix B, Criterion III, and the licensee's accepted Quality Assurance Program (Updated Final Safety Analysis Report, Section 17.2.3) require that measures shall be established to ensure the design basis are correctly translated into drawings. They also require that measures shall also be established for the review for suitability of application of materials essential to the safety-related functions.

Contrary to the above, although measures were established, they were inadequate. As of November 21, 1996, the design bases were not correctly translated into drawings and reviews for suitability of application of materials were inadequate, in that, the bill-of-material for the replacement Service Water pumps specified one-inch diameter, A307, low strength, non-dynamic loading, bolts for the column flanges and bowls flange connections instead of one-inch diameter, A325, high strength

bolts. This resulted in a Unit 2 pump being installed with bolts that did not conform to the applicable code requirements.

This is a Severity Level IV violation (Supplement I).

- C. 10 CFR 50, Appendix B, Criterion V, and the licensee's accepted Quality Assurance Program (Updated Final Safety Analysis Report, Section 17.2.5) require that activities affecting quality shall be accomplished in accordance with documented drawings.

Drawing No. N-96014-3-S-001, Sheet 1, required that the tolerance on the dimensions of anchor bolts for the Component Cooling Water surge tank supports be minus zero inches, plus two inches.

Contrary to the above, as of November 21, 1996, an activity affecting quality was not accomplished in accordance with documented drawings. Actual dimensions of the anchor bolts for the Component Cooling Water surge tank exceeded the specified minus tolerance by one and one-half inches and the plus tolerance by one and one-quarter inches.

This is a Severity Level IV violation (Supplement I).

## **REPLY TO NOTICE OF VIOLATION A**

### **1. REASON FOR THE VIOLATION**

The reason for the violation appears to be a design error from initial plant construction. During original plant design and construction, a penetration between the Unit 2 Quench Spray (QS) and Safeguards sump areas appears to have been purposely left open to allow liquid to migrate from the QS basement to the Safeguards sump. However, the open penetration resulted in a potential unfiltered release path to the environment following a design basis accident if leakage into the Safeguards sump was allowed to backflow into the Quench Spray Pump House. In addition, personnel error resulted in the holes in the cubicle floor for the Unit 2 "B" Low Head Safety Injection (LHSI) pump and the "B" Outside Recirculation Spray (ORS) pump being grouted closed sometime in the past. This would have initially prevented pump seal leakage from draining to the Safeguards area sump. There was no safety impact associated with this condition because leakage would accumulate in the pump cubicle and then drain through the discharge piping penetration in the pump cubicles to the Safeguards area sump. In addition, the Safeguards Area Ventilation System will continue to process the ventilation discharge through the charcoal filters.

### **2. CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED**

Both trains of safeguards ventilation were declared inoperable and Technical Specification 3.0.3 was entered following the discovery of the open penetration between the Unit 2 Quench Spray and Safeguards sump areas.

Licensee Event Report 50-339, 96-001-00 was issued on June 5, 1996 to document the discrepancy with the open penetration between the Unit 2 Quench Spray and Safeguards areas.

The open penetration was sealed by implementation of a temporary modification and both trains of safeguards ventilation were declared operable. The temporary modification was monitored on a periodic basis until permanent repairs were implemented.

Design Change 96-179 was implemented to provide permanent isolation of the penetration between the Unit 2 Quench Spray and Safeguards sump areas.

The floor drain holes for the "B" LHSI pump and the "B" ORS pump cubicles to the safeguards area sump were opened.

A review of the Unit 1 Quench Spray and Safeguards areas was performed and no similar discrepancies were identified.

Design controls, which have been strengthened since original plant construction, should prevent recurrence.

**3. CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS**

No further corrective actions are required.

**4. THE DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Full compliance has been achieved.



## **REPLY TO NOTICE OF VIOLATION B**

### **1. REASON FOR THE VIOLATION**

The primary reason for the violation was the failure on the part of the pump vendor to thoroughly implement their quality assurance program.

It should be noted that the Inspection Report indicates that the manufacturer's Quality Control inspector identified a discrepancy in the bolts at various column flanges and the bowls for the replacement service water pumps. However, as discussed below, identification of this deviation was discovered when a discrepancy between the vendor's seismic analysis report and the bolt material actually installed in the pump bowl assemblies was identified by a Virginia Electric and Power Company vendor surveillance representative.

Virginia Electric and Power Company selected a safety related component supplier to manufacture four replacement SW pumps or bowl assemblies in accordance with the Quality Assurance Program requirements of 10 CFR 50, Appendix B, Criterion IV. The vendor by accepting the purchase order agreed to ensure that the designed components are correctly translated into drawings and to the physical components. The Specification (NAP-0042) supplied to the vendor for manufacturing the pump bowl assemblies provided general design requirements but did not specify materials other than a stainless steel impeller. It is Virginia Electric and Power Company's expectation that the safety related pump vendor design the pump bowl assemblies in accordance with the general specification and in compliance with Appendix B of 10 CFR 50. The Bill of Materials is then created by the vendor to specify the materials necessary to manufacture the new replacement SW pump bowl assemblies.

Although Virginia Electric and Power Company entrusts the safety related vendor with the responsibility for designing the pump bowl assemblies, vendor surveillance activities are performed to ensure construction to specifications. In fact, a discrepancy between the vendor's seismic analysis report and the bolt material actually installed in the SW pump bowl assemblies was discovered by a Virginia Electric and Power Company vendor surveillance representative. A Virginia Electric and Power Company vendor surveillance representative was visiting the pump vendor facilities to witness in-process inspections and to perform documentation reviews. During the visual inspection and dimensional check of additional pump bowl assemblies being manufactured, the bolting material discrepancy was identified. The Virginia Electric and Power Company vendor surveillance representative then contacted Engineering concerning the bolting material issue.

A review of the vendor's seismic analysis report identified that the properties of A325 bolting material was used for the analysis. However, this was not

consistent with the bolting material the vendor had actually installed in the pump bowl assemblies. The pump bowl assemblies were actually constructed with A307 bolting material as specified by the vendor in the Bill of Materials. When this discrepancy was discovered, appropriate corrective actions were initiated immediately.

## **2. CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED**

An engineering evaluation was performed to document the structural adequacy of the flange bolts for the service water pump column. The evaluation concluded: 1) the stresses in the A307 flange bolts of the pump column will remain within basic allowable stresses in normal operating conditions, 2) the stresses in the A307 flange bolts of the pump column will exceed allowable stresses during an operational basis earthquake (OBE) and design basis earthquake (DBE), but no gross deformation would occur at the flange joints and the joints will maintain structural integrity, and 3) minor leakage may occur at flange connections during a seismic event but a significant loss of inventory is not expected. Since an earthquake greater than or equal to an OBE may cause minor leakage at flange connections, Abnormal Procedure 0-AP-36, Seismic Event, was revised to include a step to have the SW pumps checked for abnormal conditions and vibrations. In addition, the procedure step initiates an engineering evaluation of the pumps following a seismic event to check for any flange connection leakage that might affect the pump casing in the long term. When the bolt material is changed for each of the SW pump bowl assemblies, 0-AP-36 will be revised to remove the requirements that were implemented as a result of the engineering evaluation.

As a precaution, Specification NAP-0042 was revised to specify the use of ASTM A193 Gr. B7 bolt material with ASTM A194 Gr. 7 nut material rather than leaving the material selection to the pump vendor.

A Purchase Order BNT-527771 change order was issued to the pump vendor for the bolts and nuts replacement on the SW pump bowl assemblies currently being manufactured

The bolts and nuts for the bowl and column flange connections on 1-SW-P-1A (which has been delivered to the site but not installed) have been replaced with ASTM A193 Gr. B7 bolt material with ASTM A194 Gr. 7 nut material.

Design Change 95-015 was revised to incorporate the changes made to Specification NAP-0042, the Bill of Materials, and require stronger bolt and nut material for the SW pump bowl assemblies.



The pump vendor has been advised about the bolting material issue and the vendor is incorporating the new bolting material in the current version of the stress analysis report. The revised stress report will be submitted to Virginia Electric and Power Company for review.

The bolts and nuts on 2-SW-P-1A (installed in 1995) will be replaced with the revised materials. In addition, the bolts and nuts for the other SW pump bowl assemblies, which are being manufactured by the pump vendor, will be constructed with the revised materials. These activities are being controlled by the implementation of Design Change 95-015.

A review was performed to determine whether the discrepancy required reporting under the criteria of 10 CFR 21. This review concluded that because the SW system could perform its overall function and each station's SW pumps are essentially custom made, the discrepancy made by the pump vendor should not be considered a generic issue. Therefore, a substantial safety hazard was not created and the discrepancy was determined to be not reportable.

Personnel in the design engineering organization have been alerted to this issue and advised to provide more attention to detail when reviewing critical technical information provided by equipment vendors.

**3. CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS**

No further corrective actions are required.

**4. THE DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Full compliance has been achieved.

## **REPLY TO NOTICE OF VIOLATION C**

### **1. REASON FOR THE VIOLATION**

The reason for the violation was personnel error. Personnel did not provide sufficient attention to detail in determining the location for installing a brace on the baseplate in relation to the anchor bolts for the component cooling water system surge tank. Specifically, personnel failed to accurately incorporate numerous drawing dimensional tolerances that were specified on construction drawings.

### **2. CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED**

Engineering personnel reviewed calculation CE-1092 to qualitatively determine the effect of the out of tolerance condition. It was determined that sufficient design margin exists to accommodate the minor dimensional discrepancies. Operability of the component cooling water system was maintained.

The results of the discrepancy were discussed with appropriate craft personnel.

More detailed pre-job briefs are being conducted on projects involving complex welded supports.

Quality Inspectors were coached on performing thorough field inspections and having a questioning attitude.

### **3. CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS**

No further corrective actions are required.

### **4. THE DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Full compliance has been achieved.