

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

December 14, 1992

United States Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555

Serial No. 92-774  
NA&F/RST NL&P/RMN  
Docket Nos. 50-338  
50-339  
License Nos. NPR-4  
NPR-7

Gentleman:

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**RESPONSE TO GENERIC LETTER 88-20 AND SUPPLEMENT 1**  
**INDIVIDUAL PLANT EXAMINATION (IPE)**  
**FOR SEVERE ACCIDENT VULNERABILITIES**

Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities," and Supplement 1 requested holders of operating licenses to perform an Individual Plant Examination (IPE) of their plants for severe accident vulnerabilities. The following paragraphs summarize the enclosed final report for the North Anna Power Station IPE, a Level 1/Level 2 PRA. No significant vulnerabilities were identified by the IPE.

The internal events portion (excluding internal flooding) of the study resulted in a point estimate core damage frequency (CDF) of  $6.8E-5$  per reactor year. The internal flooding portion of the study resulted in a point estimate CDF of  $3.6E-6$  per reactor year. Attachment 1 presents the contribution to CDF by initiating event type. The results of the IPE assume that certain hardware modifications and procedural enhancements have been initiated to reduce the frequency of the dominant accident sequences. Attachment 2 identifies the hardware and procedural changes and their implementation dates. As indicated in Attachment 2, the hardware modifications designed to further enhance the flood protection system have already been completed. In addition, the majority of the procedural changes identified to reduce the risk from internal events, including internal flooding, have also been implemented.

Per the requirements of Generic Letter 88-20 and as indicated in Section 2.2.4 of the enclosed final report, Unresolved Safety Issue (USI) A-45, "Shutdown Decay Heat Removal Requirements," has been resolved by the North Anna IPE. In addition, USI A-17, "Systems Interactions in Nuclear Power Plants," and Generic Issue GI-23, "Reactor Coolant Pump Seal Failure," have also been resolved by the IPE. The resolution of these two items is discussed in Section 3.4.4 of the enclosed final report.

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Please note that it is our intention to use the enclosed North Anna IPE in future evaluations relative to plant modifications, Technical Specification changes, procedural revisions, etc. If you have questions regarding this submittal, please contact us.

Very truly yours,



W. L. Stewart  
Senior Vice President - Nuclear

Enclosure

cc: U.S. Nuclear Regulatory Commission  
Region II  
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Mr. M. S. Lesser  
NRC Senior Resident Inspector  
North Anna Power Station

## Attachment 1

### Core Damage Frequency by Initiating Event Type

<u>Initiating Event Type</u>	<u>Point Estimate Frequency per Reactor Year</u>	<u>Percentage of Total</u>
LOCA	2.1E-5	31
Loss of Offsite Power	2.0E-5	29
Transients	1.8E-5	27
Steam Generator Tube Rupture	7.0E-6	10
Interfacing LOCA	1.6E-6	2
ATWS	<u>4.2E-7</u>	<u>1</u>
Total (Internal Events)	6.8E-5	100

### Core Damage Frequency From Internal Flooding

<u>Flood Area</u>	<u>Point Estimate Frequency per Reactor Year</u>	<u>Percentage of Total</u>
Auxiliary Building Floods	2.6E-6	73
MCR/ESGR Chiller Room Floods	<u>9.7E-7</u>	<u>27</u>
Total (Internal Flooding)	3.6E-6	100

## Attachment 2

### Individual Plant Examination Recommendations Summary

<u>Activity</u>	<u>Implementation Schedule</u>
<u>Internal Events Procedure Enhancements:</u>	
• Revise periodic test procedures to include verification that the auxiliary feedwater full flow recirculation valves are closed.	Complete
• Revise periodic test procedures to include independent verification that the quench spray and recirculation spray piping is restored after testing.	Complete
• Revise emergency operating procedures to add the alternate SI header to the response not obtained (RNO) column if the normal SI header fails.	08-20-93 *
• Stagger LHSI pump tests to test one train every 45 days and each pump every 90 days.	Complete
• Administratively eliminate preplanned dual maintenance outages for the MCR/ESGR chillers.	Complete
• Improve maintenance practices to minimize the total time MCR/ESGR chillers are out of service.	Complete
• Provide procedure guidance for trouble-shooting and repairing MCR/ESGR chiller protective circuitry.	Complete

\* Procedure enhancements have been initiated

## Attachment 2 (Continued)

### Individual Plant Examination Recommendations Summary

<u>Activity</u>	<u>Implementation Schedule</u>
<u>Internal Flooding Hardware Modifications:</u>	
• Install back flow prevention devices in Charging Pump Cubicle floor drains.	Complete
• Improve the piping penetration fire barrier between the Quench Spray Pump House and Auxiliary Building to limit the flooding flow rate.	Complete
• Add a dike to protect the Chiller Room/Fan Room doors (both units) and modify of the Chiller Room/Turbine Building doors (both units).	Complete
<u>Internal Flooding Procedure Enhancements:</u>	
• Periodic inspection/replacement of the Charging Pump Cubicle drain back flow prevention devices.	Complete
• Establish administrative control to ensure periodic inspection of all flood dikes and barriers.	Complete
• Revise Periodic Test procedures to test alarms and all automatic equipment actuations for the flooding level switches.	06-18-93*
• Revise the abnormal procedure for Auxiliary Building flooding to include steps which identify and isolate remotely isolatable floods and RWST floods.	08-20-93*

\* Procedure enhancements have been initiated