

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

April 8, 1993

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

Serial No. 93-073  
NL&P/RMN R3  
Docket Nos. 50-338  
50-339  
License Nos. NPF-4  
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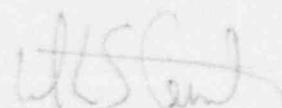
Gentlemen:

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**RESPONSE TO ELECTRICAL DISTRIBUTION SYSTEM**  
**FUNCTIONAL INSPECTION ISSUES UNDER REVIEW**

We have reviewed your letter dated February 2, 1993 which pertains to two issues related to Emergency Diesel Generator (EDG) design and operating practices which were identified for further review in Electrical Distribution System Functional Inspection (EDSFI) Report No. 50-338, 339/91-17. Our response to the two issues is attached.

Should you have any questions or require additional information, please contact us.

Very truly yours,



W. L. Stewart  
Senior Vice President - Nuclear

Attachment

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

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## RESPONSE TO NORTH ANNA ELECTRICAL DISTRIBUTION SYSTEM FUNCTIONAL INSPECTION (EDSFI) ISSUES UNDER REVIEW

A review of the two issues related to Emergency Diesel Generator (EDG) design and operating practices, that were identified during the EDSFI, has been performed. A response to each of the two issues is provided below.

### BYPASS OF EMERGENCY DIESEL GENERATOR AIR START TIMER CIRCUIT

The first issue is related to the EDG design which provides for the bypass of the air start timer circuit in the emergency mode. The concern is that there is not enough air conserved in the air start receiver tank to allow a minimum of one engine start if the EDG fails to start during the emergency mode of operation. We have considered this point and determined that the current system configuration is adequate. The basis for our conclusion is:

- 1) The EDGs are tested frequently and show a high degree of reliability. Currently, North Anna's EDG reliability is greater than 99%. The Technical Specifications provide adequate assurance that a start failure would be detected. The EDG reliability and testing frequency demonstrate that a modification is not necessary.
- 2) Each EDG at North Anna has two air compressors that can be used to recharge the start air receivers. Each compressor can be driven by either an electric motor or a diesel engine (Lister Diesel). Although the EDG is considered operable as long as one of its two air receivers has sufficient air pressure to provide the design number of starts, the Lister Diesels are performance tested periodically. The availability of the Lister Diesels is also high. Although these Lister Diesels must be manually started following drive belt installation, this is acceptable, since some manual actions and maintenance will be needed to correct the problem that caused the EDG start failure. The time needed to recharge the start air receivers is expected to be significantly less than the time needed to correct the problem that caused the EDG to initially fail to start.
- 3) This issue has been addressed by the NRC in the Final Safety Analysis Report, Regulatory Position 8.2. Specifically, the NRC staff took the position that all diesel generator trips except the engine overspeed, generator differential, and overcurrent breaker trip should be bypassed during an emergency start.
- 4) Our plans to comply with 10 CFR 50.63 include the installation of an additional diesel generator that can be connected to any emergency bus. This will enhance our ability to restore power to an emergency bus. This diesel is currently scheduled to be installed by 1995.

## EDG AUTOMATIC START SURVEILLANCE TEST ACCEPTANCE CRITERIA

The second issue is related to the EDG automatic start test acceptance criteria which accommodates overshoot of EDG voltages and frequency during an unloaded emergency start. A review of the acceptance criteria in EDG test procedures by Engineering has determined that the criterion is fully acceptable. The basis for our conclusion is:

- 1) The EDG is verified operable once every month by Technical Specification Surveillance Requirement 4.8.1.1.2.A. This surveillance requirement ensures the overall integrity of the EDG and that the EDG is capable of starting and carrying loads.
- 2) The EDG is started by an automatic start signal every six months in accordance with Technical Specification Surveillance Requirement 4.8.1.1.2.c. The basis for performing this surveillance requirement is to prove that the EDG is capable of accepting its emergency loads within 10 seconds of an emergency start signal. The permissive to close the output breaker requires a minimum voltage. There is no maximum voltage or frequency. A temporary overshoot will, therefore, not affect the EDG's ability to accept emergency loads within 10 seconds.
- 3) The design conditions are verified every 18 months in accordance with Technical Specification Surveillance Requirement 4.8.1.1.2.d.4 and 4.8.1.1.2.d.6. These surveillance requirements actually start the EDG by de-energizing the emergency bus, and verifies that the EDG energizes both its permanently connected load within 10 seconds and its subsequent loads which are automatically sequenced on the bus.
- 4) IEEE 387, Regulatory Guide 1.108 and Regulatory Guide 1.9 do not have acceptance criteria stated for a maximum voltage during an unloaded emergency start.
- 5) Currently, voltage and frequency are stable in the 10 second band without overshoot on any of the four EDGs.