

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 18, 2002

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

Serial No. 01-759
SPS/BAG R0
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
REPLY TO A NOTICE OF VIOLATION
NRC INSPECTION REPORT NOS. 50-280/01-06 AND 50-281/01-06

We have reviewed your Inspection Report Nos. 50-280/01-06 and 50-281/01-06 dated December 21, 2001 and the enclosed Notice of Violation (NOV) for Surry Units 1 and 2. The report identified one cited violation for the failure to promptly identify and correct abnormal wear of Emergency Diesel Generator (EDG) piston wrist pins and piston carrier bearings. As a result of the abnormal bearing wear, the #3 EDG was rendered inoperable for a period longer than allowed by Surry Technical Specifications. As described in our attached reply to the NOV, we have concluded that the root cause of this event was inadequate change management. Specifically, inadequate review and assessment of the lubricating oil analysis program when the test lab was changed from a commercial test lab to an in-house test lab. As a result, when the piston wrist pins and piston carrier bearings began to degrade, the oil analysis program did not identify the condition in a timely manner.

Actions have been taken to ensure adequate condition monitoring of the oil analysis program and maintenance has been performed on the three EDGs to address the piston wrist pins and piston carrier bearing degradation. We share your concern regarding the significance of the degradation found and have assembled a task team to further review other potential actions to enhance the reliability of the emergency diesels.

JTE01

We have no objection to this letter being made a part of the public record. Please contact us if you have any questions or require additional information.

Very truly yours,

A handwritten signature in black ink, appearing to read "L. Hartz", written in a cursive style.

Leslie N. Hartz
Vice President – Nuclear Engineering

Attachment

Commitments made by this letter: None

cc: U. S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, GA 30303-8931

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

REPLY TO A NOTICE OF VIOLATION
NRC SPECIAL INSPECTION EMERGENCY DIESEL GENERATORS
SURRY POWER STATION UNITS 1 AND 2
NRC INSPECTION REPORT NOS. 50-280/01-06 AND 50-281/01-06

NRC COMMENT:

"During an NRC inspection completed on September 5, 2001, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions – May 1, 2000," (Enforcement Policy), the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI, states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected.

TS 3.16.A.1 requires, in part, that a reactor shall not be operated such that the reactor coolant system pressure and temperature exceed 450 psig and 350 degrees Fahrenheit, respectively, without two diesel generators (the unit diesel generator and the shared backup diesel generator) OPERABLE. TS 3.16.B modifies the requirements of TS 3.16.A.1. Specifically, TS 3.16.B.1.a.3 requires, in part, that during power operation, if either unit's dedicated diesel generator or shared backup diesel generator is not returned to OPERABLE status within 7 days, the reactor shall be brought to HOT SHUTDOWN within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

Contrary to the above, from approximately June 2000 until April 28, 2001, the licensee failed to establish measures to assure that a condition adverse to quality was promptly identified and corrected. Specifically, the licensee did not promptly identify and correct abnormal wear and eventual failure of Emergency Diesel Generator (EDG) piston wrist pins and piston carrier bearings, as evidenced by abnormally high bearing material wear products in engine oil samples, which rendered the Number 3 EDG inoperable. As a result, with the Unit 1 and 2 reactors in power operation, Number 3 EDG was not operable from April 15, until April 28, 2001, and the licensee failed to return the Number 3 EDG to OPERABLE status within 7 days and the Unit 1 and Unit 2 reactors were not brought to HOT SHUTDOWN within the next 6 hours and COLD SHUTDOWN within the following 30 hours as required by TS 3.16.A.1 and 3.16.B.1.a.3."

REPLY TO A NOTICE OF VIOLATION
NRC SPECIAL INSPECTION EMERGENCY DIESEL GENERATORS
SURRY POWER STATION UNITS 1 AND 2
NRC INSPECTION REPORT NOS. 50-280/01-06 AND 50-281/01-06

1. Reason for the Violation, or, if Contested, the Basis for Disputing the Violation or Severity Level

The violation is correct as stated. The failure to establish measures to assure conditions adverse to quality are promptly identified and corrected was the result of an inadequate review and assessment of the change from the use of a commercial test lab to the use of an in-house lab for the lubricating oil analysis program. Incorrect action level values for the emergency diesel generator (EDG) lubricating oil silver concentration were contained in the in-house program. As a result, the oil analysis program did not promptly detect the onset of abnormal wear associated with piston wrist pins and piston carrier bearing degradation. The extent of the degradation was revealed when the #3 EDG was removed from service to investigate the increase in silver concentration in the lubrication oil. An evaluation performed after the #3 EDG was repaired and returned to service concluded that the degradation of the wrist pins and piston carrier bearings rendered the #3 EDG inoperable greater than the out of service time allowed by Surry Technical Specification 3.16.

In 1996, Surry shifted lubricating oil analysis services from a commercial test lab to an in-house test lab. The in-house lab did not provide a number of services previously rendered by the commercial lab. Specifically, the in-house lab did not provide immediate notification that a sample was out of specification, analytical services to identify adverse trends, or a database updated with action level values specific to Surry station equipment. The in-house lab only processed the samples and updated the lubricating oil database with the sample results for the Surry Predictive Analysis Group (PAG) to review. As a result, timely interpretation of oil sample data did not occur.

As a result of the failure to identify the onset of the adverse trend in silver concentration, #3 EDG piston wrist pins and piston carrier bearings continued to degrade beyond a condition necessary for operation. LER 50-280, 50-281/2001-001-00, Inoperable Emergency Diesel Generator Results in Technical Specification Violation, documented the inoperability of the diesel and indicated that inadequate lubrication was the cause of the bearing degradation. Further assessment determined that the cause of the degradation was a change from lubricating oil that contained a chlorinated paraffin wax additive to oil that was non-chlorinated. The new oil had less long-term retentive properties, which limited the amount of lubrication initially available at the bearings after extended

time in standby condition. The degradation was initiated by repeated cold starts under this marginal lubrication condition.

2. Corrective Steps Which Have Been Taken and the Results Achieved

New oil analysis software has been implemented that provides color coded visual alarms to the PAG group when the oil analysis results exceed pre-set action levels or when a statistical analysis of the trend in the data indicates a concern. The oil analysis database was reviewed to ensure that the appropriate EDG manufacturer's recommended action level values were in the program. In addition, the manufacturer's specified action level values for silver concentration in EDG lubricating oil have been re-evaluated, since these values assume uniform wear of the bearings. To address the potential for non-uniform wear conditions, lower action level values for silver concentration have been implemented in the new oil analysis software.

Power packs (cylinder, cylinder head, piston, rod) for all three EDGs have been replaced with new power packs.

Although the previously used lubricating oil was qualified for use by the manufacturer, the EDG lubricating oil was replaced in all three EDGs with oil recommended by the EDG Owner's Group.

Following the completion of the initial root cause evaluation on the #3 EDG degraded conditions, diesel engine consultants were contracted to perform several independent evaluations. These additional evaluations and their recommendations were added to the initial RCE. In addition, a category I root cause evaluation was performed to identify organizational or process weaknesses that contributed to the failure to recognize the adverse trend in EDG lubricating oil for #3 EDG in a timely manner. These evaluations have been completed and applicable recommendations have been entered into the corrective action program.

3. Corrective Steps Which Will be Taken to Avoid Further Violations

The corrective actions discussed in Section 2 are sufficient to avoid further violations associated with the lubricating oil analysis program for the EDGs. Other actions beyond the specific #3 EDG issue are identified in the above category I root cause evaluation and are being separately addressed through the station corrective action system. These actions address organizational and programmatic weaknesses that contributed to the failure to recognize the adverse trend in the EDG oil samples.

4. The Date When Full Compliance Will be Achieved

Full compliance has been achieved. Replacement of power packs and lubricating oil in all three EDGs addressed piston wrist pins and piston carrier bearing degradation. The implementation of the new oil analysis software and the verification of the EDG action level values will ensure the EDG oil analysis data will be appropriately analyzed, degrading trends identified, and corrective actions are taken as required.