



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

December 21, 2001

EA-01-235

Virginia Electric and Power Company  
ATTN: Mr. David A. Christian  
Sr. Vice President and  
Chief Nuclear Officer  
Innsbrook Technical Center - 2SW  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND  
NOTICE OF VIOLATION (NRC SPECIAL INSPECTION REPORT NOS.  
50-280/01-06 AND 50-281/01-06, SURRY POWER STATION)

Dear Mr. Christian:

The purpose of this letter is to provide you with the final results of our significance determination for the preliminary Yellow finding identified in the subject inspection report. The inspection finding was assessed under the significance determination process and was preliminarily characterized as Yellow for each unit, i.e., an issue with substantial importance to safety that will result in additional NRC inspection and potentially other NRC action. The finding involved your staff's discovery in April 2001 of failed piston wrist pins and bearings in the Number 3 Emergency Diesel Generator (EDG), which is shared by Units 1 and 2, and degraded components in the Number 1 EDG.

At Virginia Electric and Power Company's (VEPCO) request, an open regulatory conference was conducted with members of your staff on November 30, 2001, to discuss VEPCO's position on this issue. The enclosures to this letter include the list of attendees at the regulatory conference, and copies of the material presented by VEPCO and the NRC at the regulatory conference. During the conference, your staff discussed the details of the issue and their assessment of its significance. VEPCO's review of the issue attributed the preliminary cause of the failed components to a loss of oil lubrication, which was induced by use of a lubricating oil with a different chemical composition than had been used previously.

VEPCO presented several estimates of the incremental increase in core damage frequency based on various assumptions and factors and concluded that the NRC's preliminary risk estimate was overly conservative and should be characterized as White. The presentation highlighted the following major differences between VEPCO's best estimate of the incremental increase in core damage frequency and the NRC's preliminary assessment: (1) the availability of the Alternate AC diesel in the fire analysis, which was not considered in the NRC's evaluation of the VEPCO baseline risk model; (2) consideration of monthly EDG surveillances, in which VEPCO provided sufficient confidence that the Number 3 EDG would have performed its intended function for at least two hours, thereby allowing loss of offsite power events lasting less than two hours to be excluded from contributing to the risk increase; (3) an "exposure time" for the Number 3 EDG that VEPCO modeled as half the time between the dates of

October 3, 2000, and April 28, 2001, based on VEPCO's view that bearing degradation would likely occur in progressive phases; and (4) the use of a nominal common cause factor in the risk analysis, which in VEPCO's view would be more appropriate based on variability of degradation rates (between EDGs) and observation of the differing as-found EDG bearing conditions. VEPCO also presented updated information on reactor coolant pump seals currently installed in each unit.

After considering the information developed during the inspection and the information VEPCO provided at the conference, the NRC has concluded that the final inspection finding is appropriately characterized as White for each unit. This determination was based on our review of the relevant risk information discussed at the conference and the information reviewed during and after our inspection. In particular, the NRC concluded that the Alternate AC diesel generator should be included in the fire risk analysis to provide a more accurate estimate of the increase in risk. Consideration of the Alternate AC diesel was not a part of VEPCO's initial baseline fire risk model, and thus was not included in the NRC's preliminary estimate. The NRC also concluded that the monthly EDG surveillances provided sufficient confidence that the Number 3 EDG would have performed its intended function for at least two hours during the time period of October 3, 2000, through late April 2001. Regarding exposure time, VEPCO did not provide sufficient information to allow the NRC to conclude that the Number 3 EDG could perform its complete mission time (24 hours) after the fast start test on October 3, 2000. As a result, the time period during which the #3 EDG would not have been able to fulfill its safety function, October 3, 2000, through April 28, 2001, (207 days), was used as the fault exposure time in the NRC's updated risk estimate. The NRC considered the information provided by VEPCO regarding use of a nominal common cause factor and concluded that because the failure mechanism (i.e., lubricating oil) existed simultaneously in all three EDG's, the common cause factor used in the NRC's preliminary risk estimate was appropriate. Based on the above and considering the information presented regarding the updated status of reactor coolant pump seals, the NRC's estimate of the increase in core damage frequency was approximately  $5 \times 10^{-6}$ /year for Units 1 and 2.

You have ten business days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Supplement 3.

The NRC also determined that a violation occurred involving; (1) the failure to assure that a condition adverse to quality, involving the failure of equipment, was promptly identified and corrected as required by 10 CFR 50, Appendix B, Criterion XVI and (2) the failure to comply with Technical Specification (TS) 3.16.B.1.a.3 operability requirements for the Number 3 EDG. The failure to comply with TS 3.16.B.1.a.3 occurred from April 15-28, 2001, which corresponds to the time when the EDG was last operated until the time it was returned to service after replacing all twenty power pack assemblies. The TS violation is a result of VEPCO's failure to promptly identify and correct the condition adverse to quality, and as such the failure to meet these requirements has been cited as one violation in the enclosed Notice of Violation (Notice). The circumstances surrounding the violation is described in detail in the subject inspection report. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions - May 1, 2000," NUREG-1600, the Notice is considered escalated enforcement action because it is associated with a White finding.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

Because plant performance for this issue has been determined to be in the increased regulatory response band, we will use the NRC Action Matrix to determine the most appropriate NRC response for this finding. We will notify you, by separate correspondence, of that determination.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures, and your response, will be available electronically for public inspection in the NRC Public Document Room (PDR) or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR and PARS without redaction.

Should you have any questions regarding this letter, please contact Victor M. McCree, Acting Director, Division of Reactor Projects at 404-562-4500.

Sincerely,

*/RA/*

Bruce S. Mallett  
Acting Regional Administrator

Docket Nos.: 50-280, 50-281  
License Nos.: DPR-32, DPR-37

Enclosures:

1. Notice of Violation
2. List of Attendees
3. Conference material presented by VEPCO
4. Conference material presented by NRC

cc w/encls: (see page 4)

VEPCO

4

cc w/encls:

Stephen P. Sarver, Director  
Nuclear Licensing and  
Operations Support  
Virginia Electric & Power Company  
Electronic Mail Distribution

Richard H. Blount, II  
Site Vice President  
Surry Power Station  
Virginia Electric & Power Company  
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V. McCree, RII  
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A. Boland, RII  
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R. Musser, RII  
C. Evans, RII  
L. Garner, RII  
R. Hannah, RII  
K. Clark, RII  
PUBLIC  
OEMAIL

OFFICE	RII:ORA	RII:EICS	RII:DRS	RII:DRP	ORA	OE	NRR
SIGNATURE	NLO CFE	ATB	WGR1	LXW1/FOR	BSM/FOR	D.NELSON TELE	VIA E-MAIL
NAME	CEVANS	ABOLAND	WROGERS	VMCCREE	LPLISCO	FCONGEL	MSYKES/NRR
DATE	12/14/2001	12/21/2001	12/14/2001	12/17/2001	12/21/2001	12/18/2001	12/18/2001

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DOCUMENT NAME: C:\Program Files\Adobe\Acrobat 4.0\PDF Output\Surry final.wpd

RII:DRP  
KDLANDIS  
12/17/2001

## NOTICE OF VIOLATION

Virginia Electric and Power Company  
Surry Power Station  
Units 1 & 2

Docket Nos.: 50-280, 50-281  
License Nos.: DPR-32, DPR-37  
EA-01-235

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 an 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, the 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.

This violation is associated with a White SDP finding.

Pursuant to the provisions of 10 CFR 2.201, Virginia Electric and Power Company is hereby required to submit a written statement or explanation to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector office at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may

Enclosure 1

reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 21<sup>st</sup> day of December 2001

## LIST OF OPEN REGULATORY CONFERENCE ATTENDEES

### NUCLEAR REGULATORY COMMISSION:

B. Mallett, Acting Regional Administrator, Region II (RII)  
V. McCree, Acting Director, Division of Reactor Projects (DRP), RII  
K. Landis, Branch Chief, DRP, RII  
S. Sparks, Senior Enforcement Specialist, RII  
R. Musser, Senior Resident Inspector, DRP, RII  
W. Rogers, Senior Reactor Analyst, DRS, RII  
L. Garner, Senior Project Engineer, DRP, RII  
K. Clark, Senior Public Affairs Officer, RII  
P. Fredrickson, Branch Chief, DRP, RII  
K. Green-Bates, Project Engineer, DRP, RII  
D. Nelson, Senior Enforcement Specialist, Office of Enforcement, (teleconference)  
G. Edison, Project Manager, Project Directorate II, Office of Nuclear Reactor Regulation (NRR)  
(teleconference)  
S. Rosenberg, RII Coordinator, Office of the Executive Director for Operations (teleconference)  
J. Rajan, Mechanical Engineering Branch, NRR (teleconference)  
O. Chopra, Electrical Engineering Branch, NRR (teleconference)

### VIRGINIA ELECTRIC POWER COMPANY:

R. Blount, Site Vice President, Surry Power Station  
L. Hartz, Vice President, Nuclear Engineering, Corporate  
T. Hook, Lead Probabilistic Risk Assessment Engineer  
S. Sarver, Director, Nuclear Licensing, Corporate  
B. Foster, Director, Safety and Licensing, Surry Power Station

### OTHER ATTENDEES:

D. Salter, Consultant, HGP, Inc.



**REGULATORY CONFERENCE AGENDA**

**SURRY POWER STATION, UNITS 1 AND 2  
NOVEMBER 30, 2001 AT 10:30 A. M.  
NRC REGION II OFFICE, ATLANTA, GEORGIA**

- I. OPENING REMARKS AND INTRODUCTIONS  
Bruce S. Mallett, Acting Regional Administrator**
- II. NRC SIGNIFICANCE DETERMINATION PROCESS AND  
REGULATORY CONFERENCE POLICY  
Scott E. Sparks, Enforcement Officer  
Enforcement and Investigation Coordination Staff**
- III. PRELIMINARY RISK SIGNIFICANCE DETERMINATION  
Victor M. McCree, Acting Director  
Division of Reactor Projects**
- IV. LICENSEE PRESENTATION ON RISK SIGNIFICANCE  
Richard Blount, II / Byran Foster / Tom Hook  
VEPCO**
- V. PRESENTATION OF APPARENT VIOLATIONS  
Victor M. McCree, Acting Director  
Division of Reactor Projects**
- VI. LICENSEE RESPONSE TO APPARENT VIOLATIONS  
Richard Blount, II  
VEPCO**
- VII. BREAK / NRC CAUCUS**
- VIII. NRC FOLLOWUP QUESTIONS**
- IX. CLOSING REMARKS  
Bruce S. Mallett, Acting Regional Administrator**

## Apparent Violation

- A. 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.**

**From March 22, 2000, until April 28, 2001, the licensee failed to establish measures to assure that a condition adverse to quality, involving the failure of equipment, was promptly identified and corrected. Specifically, the licensee did not promptly identify and correct abnormal wear to and eventual failure of piston wrist pins and piston carrier bearings which rendered the Number 3 Emergency Diesel Generator (EDG) inoperable. Wear and damage to these components resulted in increased silver content in the Number 3 EDG lubricating oil. From March 2000 until April 2001 the licensee failed to investigate the cause of the increasing silver content in the lubricating oil. During the later portion of this period, beginning with the October 31, 2000, oil sample, all six oil samples either were at or exceeded the EDG engine manufacture's "high correct condition" range of 2.0 parts per million silver content. Corrective actions to repair and return the EDG to service were not completed until April 28, 2001.**

**Note: The apparent violations discussed at this Regulatory Conference are subject to further review and are subject to change prior to any resulting enforcement action.**

## Apparent Violation

- B. 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. 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 an 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.**

**The licensee failed to return the Number 3 emergency diesel generator (EDG), the share backup diesel generator, to service 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. The Number 3 EDG was not operable from April 15 until April 28, 2001, approximately 6 days longer than the 7 days allowed, with the Unit 1 and 2 reactors in power operation.**

**Note: The apparent violations discussed at this Regulatory Conference are subject to further review and are subject to change prior to any resulting enforcement action.**