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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

May 11, 2012

EA-12-033

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, Virginia 23060-6711

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING, NOTICE OF VIOLATION, AND ASSESSMENT FOLLOW-UP LETTER (NRC INSPECTION REPORT 05000338/2012010 AND 05000339/2012010 – NORTH ANNA POWER STATION)

Dear Mr. Heacock:

This letter provides you with the final significance determination of the preliminary Greater than Green finding for both units identified in NRC Inspection Report Nos. 05000338/2012008 and 05000339/2012008, dated March 21, 2012. This finding involved an Apparent Violation (AV) of Technical Specification (TS) 5.4.1.a for the failure to establish and maintain emergency diesel generator (EDG) maintenance procedures as recommended by Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance. Specifically, maintenance procedure 0-MCM-0701-27 did not provide adequate guidance for the installation of the jacket water cooling inlet jumper gasket which resulted in a faulty gasket installation on the Unit 2 "H" (2H) EDG in May 2010. As a result, the 2H EDG failed to perform its safety function on August 23, 2011.

At Dominion's request, an open regulatory conference was conducted with members of your staff on April 20, 2012, to discuss Dominion's views on this issue. During the conference, your staff described your assessment of the significance of the finding (ML12115A082) and agreed with the NRC's characterization of the finding as an AV. However, your staff concluded that this finding is of very low safety significance (Green) for both units. Your staff highlighted several differences between Dominion's risk assessment and the NRC's preliminary risk assessment as documented in the NRC inspection report. Specifically, your staff has different views on the exposure time, common cause failure and basic event probabilities from the NRC's risk assessment.

~~Enclosure(s) transmitted herewith contain(s) SUNSI. When separated from enclosure(s), this transmittal document is decontrolled.~~

After considering the information developed during the inspection and the information provided by Dominion during the regulatory conference, the NRC has concluded that the finding is appropriately characterized as White (low to moderate safety significance) for both units, which will require additional NRC inspections. The bases for the NRC's significance determination of this finding, and the differences in Dominion's characterization of the finding, are discussed in Enclosure 2. NRC's final Significance Determination Process (SDP) Phase 3 results are discussed in Enclosure 3.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding or the Notice of Violation associated with this finding. An appeal of the White finding will be considered to have merit only if it meets the criteria given in NRC Inspection Manual Chapter 0609, Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region II, U.S. Nuclear Regulatory Commission, 245 Peachtree Center Avenue, Suite 1200, Atlanta, GA 30303-1257.

The NRC also has determined that the finding involving the failure to establish and maintain EDG maintenance procedures as recommended by Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance is a violation of TS 5.4.1.a. The violation is cited in Enclosure 1, Notice of Violation (Notice) and the circumstances surrounding it are described in detail in NRC Inspection Report 05000338, 339/2011005. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding for both units.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved is already adequately addressed on the docket in the North Anna Open Regulatory Meeting Summary, dated April 24, 2012 (ML12115A082). Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. However, you are required to submit a written statement or explanation pursuant 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In this case, please follow the instructions specified in the Notice of Violation, Enclosure 1.

For administrative purposes, this letter is issued as a separate NRC Inspection Report, No. 05000338/2012010 and 05000339/2012010. Accordingly, AV 05000338, 339/2011005-02 is updated consistent with the regulatory positions described in this letter. Therefore, AV 05000338, 339/2011005-02 is now Violation 05000338, 339/2011005-02, Failure to Provide Adequate Guidance for Installation of 2H EDG Jacket Water Cooling Inlet Jumper with a safety significance of White and a cross-cutting aspect in the area of problem identification and resolution of operating experience, and the aspect of implementing operating experience, P.2(b).

The NRC has determined the performance of North Anna Power Station Unit 1 and Unit 2 to be in the Regulatory Response Column of the Reactor Oversight Process Action Matrix as of the fourth quarter of calendar year 2011. Therefore, the NRC plans to conduct a supplemental

inspection in accordance with Inspection Procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," to provide assurance that the root causes and contributing causes of the risk-significant performance issues are understood, that the extent of cause is identified, and that your corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence. The NRC requests that your staff provide notification of your readiness for the NRC to conduct a supplemental inspection to review the actions taken to address the White inspection finding.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made electronically available for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, if you do respond, you 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, 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 information, 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 2.390(b) to support a request for withholding confidential commercial or financial information). The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions.

Should you have any questions concerning this letter, please contact Mr. Gerald McCoy at 404-997-4551.

Sincerely,

/RA/

Victor M. McCree
Regional Administrator

Docket Nos. 50-338, 50-339
License Nos. NPF-4, NPF-7

Enclosures:
1. Notice of Violation
2. NRC Basis for Final Significance Determination
3. NRC's Final SDP Phase 3 Results w/Attachments (Removed)

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ADAMS: X Yes ACCESSION NUMBER: ML12136A115 X SUNSI REVIEW COMPLETE X FORM 665 ATTACHED

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DATE	5/3/2012	5/8/2012	5/4/2012	5/4/2012	5/4/2012	5/8/2012	5/10/2012
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cc w/encls:
Nelson K. Martin, Manager
Nuclear Fleet Protection Services
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Margaret A. Earle
Nuclear Licensing and Operations Support
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

cc w/Inspection Summary:
Clarence L. Gum
Manager, Nuclear Protection Services
North Anna Power Station
1022 Haley Drive
Mineral, VA 23117

cc w/o encl:
Mr. Gerald T. Bischof
Site Vice President
North Anna Power Station
Virginia Electric & Power Company
Electronic Mail Distribution

Fred Mladen
Director, Station Safety & Licensing
Virginia Electric and Power Company
Electronic Mail Distribution

Michael Crist, Plant Manager
North Anna Power Station
Virginia Electric & Power Company
Electronic Mail Distribution

Lillian M. Cuoco, Esq.
Senior Counsel
Dominion Resources Services, Inc.
Electronic Mail Distribution

Tom Huber
Director, Nuclear Licensing & Operations Support
Innsbrook Technical Center
Electronic Mail Distribution

Ginger L. Rutherford
Virginia Electric and Power Company
Electronic Mail Distribution

Virginia State Corporation Commission
Division of Energy Regulation
P.O. Box 1197
Richmond, VA 23209

Attorney General
Supreme Court Building
900 East Main Street
Richmond, VA 23219

Senior Resident Inspector
North Anna Power Station
U.S. Nuclear Regulatory Commission
P.O. Box 490
Mineral, VA 23117

Donald R. Taylor, Licensing Supervisor
North Anna Power Station
P. O. Box 402
Mineral, VA 23117-0402

Michael M. Cline, Director
Virginia Department of Emergency Services Management
Electronic Mail Distribution

Executive Vice President
Old Dominion Electric Cooperative
Electronic Mail Distribution

County Administrator
Louisa County
P.O. Box 160
Louisa, VA 23093

Letter to David A. Heacock from Victor M. McCree dated may 11, 2012

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING, NOTICE OF VIOLATION, AND ASSESSMENT FOLLOW-UP LETTER (NRC INSPECTION REPORT 05000338/2012010 AND 05000339/2012010 – NORTH ANNA POWER STATION)

Distribution w/encls:
C. Evans, RII EICS
L. Douglas, RII EICS
OE Mail
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NOTICE OF VIOLATION

North Anna Power Station
Unit 1 and Unit 2

Docket Nos. 50-338, 50-339
License Nos. NPF-4, NPF-7
EA-12-033

During an NRC inspection completed on December 31, 2011, a violation of NRC requirements was identified. The circumstances surrounding the violation were described in detail in NRC Inspection Report Nos. 05000338, 339/2011005 dated February 13, 2012. In accordance with the NRC Enforcement Policy, the violation is set forth below:

> Technical Specification (TS) 5.4.1.a states, in part, that written procedures shall be established and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, of which Section 9 specifies procedures for performing maintenance.
>
> Regulatory Guide 1.33, Revision 2, Appendix A, Section 9, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.
>
> Contrary to the above, from June 2, 2010, until August 23, 2011, the licensee failed to establish and maintain maintenance procedures appropriate to the circumstances for the safety-related EDGs. Specifically, maintenance procedure 0-MCM-0701-27 did not provide adequate guidance for installation of the jacket water cooling inlet jumper gasket which resulted in a faulty gasket installation on the Unit 2 "H" (2H) EDG in May 2010. As a result, the 2H EDG failed to perform its safety function when called upon on August 23, 2011.

This violation is associated with a White Significance Determination Process finding for both units for the Mitigating Systems cornerstone.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved is already adequately addressed on the docket in the North Anna Open Regulatory Meeting Summary, dated April 24, 2012 (ML12115A082). However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In this case, or if you choose to respond, clearly mark your response "Reply to a Notice of Violation EA-12-033," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001 with a copy to the Regional Administrator, Region II and a copy to the NRC resident inspector 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).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), assessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

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.

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

Dated this 11 day of May 2012.

NRC BASIS FOR FINAL SIGNIFICANCE DETERMINATION

On April 20, 2012, a regulatory conference was held regarding a coolant leak on the North Anna 2H Emergency Diesel Generator (EDG). During the regulatory conference, the licensee presented their risk assessment for the finding and provided specific discussion related to the exposure time, treatment of common cause failures, and the failure probability for specific basic events present in the dominant sequences for the finding.

The NRC staff has reviewed all the data and information presented by the licensee during the regulatory conference and has reached a final significance determination for this finding. The conclusion is that the risk characterization of the finding is WHITE, a finding of low to moderate safety significance, for both North Anna units. The details supporting this result are contained in the revised phase 3 Significance Determination Process (SDP) risk assessment which is attached as Enclosure 3 to this letter. Each of the specific discussion areas presented by the licensee will be discussed in the following paragraphs.

The licensee identified several specific basic event failure probabilities where the North Anna site specific failure probability differed from the industry average values used by the NRC in the preliminary SDP risk evaluation. The NRC has reviewed the basis for the development of the North Anna site specific basic event failure probabilities presented by the licensee and agrees that a few specific human error probabilities should be changed for use in the final SDP risk evaluation of the finding. Basic event AFW-XHE-XM-CNTRL, "Operator Fails to Control Turbine Driven Auxiliary Feedwater (TDAFW) pump" was changed from a failure probability of 3.0 E-1 to the licensee's value of 1.0 E-1. Additionally, basic event EPS-XHE-XM-AAC "Failure to Start and Align the AAC Station Blackout (SBO) Diesel Generator" was changed from a failure probability of 1.0 E-1 to the licensee's value of 4.4 E-2. These values were used to support the final SDP risk assessment for both North Anna units for this finding. These changes resulted in a reduction of the estimated risk of the finding for both units.

The licensee provided discussion at the Regulatory Conference regarding the NRC's treatment of common cause failure probability for this finding. The EDG gasket installation and staggered test data were provided and the licensee articulated that the failure cause was known and that the issue should be considered an independent failure with the common cause failure probability remaining at nominal value. The NRC has reviewed the licensee's data and discussion and has decided that the finding represents a condition that merits treatment for potential common cause failure increase. The performance deficiency identified discrepancies in the EDG maintenance procedure related to the sealant cure time, torque values, and jack bolt adjustments. The licensee's root cause evaluation identified insufficient procedural guidance as a contributing cause. The NRC followed established guidance and process for treatment of this issue as a potential common cause failure.

When performing event or condition analysis, NRC assesses the risk incurred not only in the as-found conditions of the observed failure(s) but also, and more importantly, the contribution of potential events associated with the performance deficiency that did not occur but still represent a risk to public health and safety. In other words, when performing an SDP assessment, the

NRC considers not only what actually happened, but also what could have happened with respect to the performance deficiency. Even if only one failure had occurred, as was the case with this finding, considerations for potential common cause failure (CCF), in addition to potential for other equipment failure, would still be included in the SDP risk assessment. In this case, the observed failure was associated with a proximate cause (e.g., inadequate procedural guidance) capable of impacting other components within the same common cause component group (CCCG), where CCCG can be defined as a group of components that are considered to share a potential for failing due to the same cause. Therefore, the SDP risk assessment for this finding includes considerations of the potential failure of other equipment in the same CCCG due to the same proximate cause.

The licensee presented information from the root cause evaluation and performed some mockup testing to demonstrate that the failure should be considered a demand failure which supported their assertion that the exposure period should be limited to the last EDG surveillance test, a period of 28 days. The licensee's root cause evaluation (RCE) observed that the six gasket ridge marks indicated gasket displacement due to a combination of pressure and thermal cycling. The root cause evaluation (RCE) indicated that failure was most likely due to initial installation problems leading to movement over time, and that gasket observations provide clear indication that the failed gasket had been in the process of moving toward failure for some time. The NRC believes that the evidence provides some insight that the failure mode is most likely time based. The NRC does not agree that the evidence is sufficient to provide reasonable assurance that the failure could not have occurred prior to the last surveillance.

The licensee contention that the ridge marks can be dated and that this provides evidence that the failure could not have occurred prior to the last test is not credible. There is not enough detail provided in the root cause evaluation regarding the initial as-found conditions to support these conclusions. There is a high amount of uncertainty in making these conclusions due to concerns regarding: (1) How the gasket was initially disassembled to ensure that the marks were not made during disassembly, or initially present, or caused by slippage during initial installation; (2) The root cause evaluation does not detail if the marks were present on the reverse of the gasket or on the metal surfaces; (3) The root cause evaluation does not indicate if the marks are indentations in the gasket material or actually made of the sealant material; (4) The root cause evaluation provides no detail on how the gasket samples were controlled during the investigation process; and (5) The root cause evaluation does not account for the lack of correlation of the makings to the number of heatup and cooldown cycles completed by the engine.

The licensee developed a mockup and performed testing to better understand the gasket failure mode. The mockup test results are also uncertain due to differences between the test apparatus and actual plant conditions specifically: (1) No accounting for vibration or aging affects on the gasket or sealant; and (2) Inability to establish accurate conditions for the failure as there is not sufficient detail on the conditions of the failure as discussed above. The test was not able to reproduce the failure without manually adjusting the jack bolts and the testing was not able to reproduce the ridge marks. The mockup testing does not provide enough proof to support the 28 day exposure period assumption. Due to the uncertainty involved in the gasket failure the NRC performed a sensitivity analysis using a T over 2 exposure time. For this case

the time T is from gasket installation until gasket failure. The T over 2 is therefore 7.5 months. This method is described in the NRC Risk Assessment Standardization Project (RASP) manual for conditions when the exact time of failure is not known. The result of the sensitivity analysis was that the risk was WHITE for both units, the same result as for the 10 month exposure period.

In summary, the NRC has reviewed the discussions and material presented at the regulatory conference and has agreed to modify the human error probabilities for manually starting and aligning the station blackout (SBO) diesel and for operator control of the turbine driven auxiliary feedwater (TDAFW) pump. The NRC concluded that the failure has a potential for common cause and that the appropriate exposure period was determined to be 10 months. The resultant final SDP analysis characterized the risk significance of the finding as WHITE for both units.