

**Virginia Electric and Power Company  
North Anna Power Station  
1022 Haley Drive  
Mineral, Virginia 23117**

December 20, 2013

Attention: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Serial No.: 13-574A  
NAPS: MPW  
Docket No.: 50-338  
License No.: NPF-4

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Supplemental Licensee Event Report applicable to North Anna Power Station Unit 1.

Report No. 50-338/2013-001-01

This report has been reviewed by the Facility Safety Review Committee and will be forwarded to the Management Safety Review Committee for its review.

Sincerely,



Gerald T. Bischof  
Site Vice President  
North Anna Power Station

Enclosure

Commitments contained in this letter: None

cc: United States Nuclear Regulatory Commission  
Region II  
Marquis One Tower  
245 Peachtree Center Ave., NE, Suite 1200  
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector  
North Anna Power Station

*IE22  
NRR*

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> North Anna Power Station, Unit 1	<b>2. DOCKET NUMBER</b> 05000 338	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Unit 1 Emergency Diesel Generators Inoperable During Core Alterations

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER
09	26	2013	2013	-- 001 --	01	12	20	2013	FACILITY NAME	DOCUMENT NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>  6	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)							
<b>10. POWER LEVEL</b>  0	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)				
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)				
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)				
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)				
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)				
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)				
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)				
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER				
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)					

Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME <b>Gerald T. Bischof, Site Vice President</b>	TELEPHONE NUMBER (Include Area Code) <b>(540) 894-2101</b>
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b> MONTH:    DAY:    YEAR:
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On September 26, 2013, at 1717 hours with Unit 1 in Mode 6, zero percent power, core alterations began with two inoperable emergency diesel generators. One emergency diesel generator (1J EDG), in a two train system, was out of service for maintenance with the second emergency diesel generator (1H EDG) inoperable, but unknown at the time. A subsequent failure of the 1H EDG during a 24 hour run, parallel to the grid, determined prior inoperability. Technical Specifications 3.8.2 requires one operable qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by TS 3.8.10 and one OPERABLE EDG. Momentary loss of control power to the Digital Reference Unit (DRU) caused it to reset to the 60 HZ setting which unloaded the EDG. A loose fuse holder caused the momentary loss of control power. This event is reportable per 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s), required by TS 3.8.10, was OPERABLE and the station blackout EDG was also available. Additionally, had a loss of offsite power occurred, the 1H EDG would have been able to supply power in the isochronous mode to the emergency bus. Therefore, the health and safety of the public were not affected by the event.

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CONTINUATION SHEET

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NARRATIVE

**1.0 DESCRIPTION OF THE EVENT**

On September 26, 2013, at 1717 hours with Unit 1 in Mode 6, zero percent power, a condition prohibited by Technical Specifications (TS) occurred when reactor core alterations began with one emergency diesel generator (1J EDG), in a two train system, out of service for maintenance with the second emergency diesel generator (1H EDG) (EIS System EK, Component DG) inoperable, but unknown at the time. A subsequent failure of the 1H EDG determined prior inoperability. Technical Specifications 3.8.2 requires one qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by TS 3.8.10 and one OPERABLE EDG.

On September 24, 2013 the 1H EDG was returned to service and declared operable following post maintenance testing (PMT) for a design change modification of the governor control system. Parts installed by the Design Change included a 2301A Load Sharing and Speed Control, a Digital Reference Unit (DRU) and an EGB-13P Governor/Actuator.

On September 24, 2013 the 1J EDG was removed from service for maintenance. Reactor core reload commenced on September 26, 2013 and completed on September 28, 2013. During this time the 1H EDG was relied upon as the OPERABLE EDG to meet TS. Subsequently on October 3, 2013 at 1115 hours, the 1J EDG was declared operable following repairs and PMT.

On October 5, 2015 at 0828 hours, the 1H EDG was started for a twenty four hour periodic test run. On October 6, 2013 at 0006 hours, 1H EDG experienced a loss of load with local indication showing the fuel racks moved to a lower fuel output. The 1H EDG was secured and declared inoperable.

The failure of the governor control system occurred with the 1H EDG parallel to the grid under 24-hour load testing. Assuming a complete and permanent loss of control power to the 2301A Electronic Governor and DRU, the mechanical governor would have operated at the high speed stop at 63 Hz per design.

However, a momentary loss of power to the Electronic Governor and DRU, due an internal issue in the DRU electronics, a loose wiring connection, or a loose fuse holder would have resulted in the DRU resetting to 900 RPM / 60 Hz set point. The 900 RPM / 60 Hz set point is the reference value used in isochronous mode of operation (design basis function for the EDG).

A complete loss of power or momentary power interruption to the 2301A and DRU would not have prevented the 1H EDG from supplying emergency electrical power during a loss of offsite power to the emergency bus in the isochronous mode. However, the 1H EDG was unable to fulfill its design function since the 1H EDG could not meet TS Surveillance Requirement 3.8.1.15. Synchronization with the offsite power source while loaded with emergency loads upon a simulated restoration of offsite power and the ability to transfer

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**NARRATIVE**

loads to offsite power could not be performed to satisfy the TS surveillance requirement.

**2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

No significant safety consequences resulted from this event since one OPERABLE qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s), required by TS 3.8.10, was available and the station blackout EDG was also available to supply power if required. Additionally, had a loss of offsite power occurred, the 1H EDG would have been able to supply power to the emergency bus. As such, the health and safety of the public were not affected by the event. This event is reportable per 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications.

**3.0 CAUSE**

The direct cause for the complete loss of electrical load of the 1H EDG during 24-hour testing was the momentary loss of electrical control power to the DRU. The apparent cause for the momentary loss of electrical control power to the DRU was a loose fuse holder due to numerous removal and re-installation evolutions during design change implementation, testing, and troubleshooting. This lead to the spreading of the fuse clips. The final installation of the fuse prior to the 24-hour test run was performed by a supplemental electrician not familiar with normal expectations for verification of tightness.

**4.0 IMMEDIATE CORRECTIVE ACTION(S)**

Following the loss of load the 1H EDG was tripped from the Control Room.

**5.0 ADDITIONAL CORRECTIVE ACTIONS**

The 1H EDG mechanical actuator, DRU, and power supply fuse holder for fuse FU1NA were subsequently replaced. All wiring connections were verified tight. Post maintenance testing was performed under 1-PT-82.12H, 1H Diesel Generator Isochronous Mode (Start by ESF Actuation) and 1-PT-83.12H, 1H Diesel Generator Test (Start by ESF Actuation) followed by 24-hour run and hot restart test. Post maintenance testing was completed satisfactorily.

The mechanical governor and DRU removed from the 1H EDG were sent to a vendor for testing. The mechanical governor and DRU were found to operate properly following 24-hour bench testing. A loose power supply fuse holder (fuse holder for FU1NA) to the 2301A Load Sharing and Speed Control and DRU was also identified. Vendor testing has verified that a momentary loss of electrical power to the DRU would result in a loss of load event.

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**NARRATIVE**

**6.0 ACTIONS TO PREVENT RECURRENCE**

Guidance for verification of fuse clip tightness and inspection, as part of fuse removal and replacement, will be documented in Maintenance Operating Procedures. Guidance for fuse and fuse clip inspection expectations for supplemental personnel will be documented in the governing administrative procedure. Training needs for electrical maintenance activities with regards to installing fuses, inspecting fuse holders and verification of adequately securing fuses is being evaluated. The results will be provided to the Maintenance Training Review Board for inclusion in Electrical Maintenance Training. A time based preventive maintenance replacement strategy for EDG system fuse holders is being evaluated. These actions have been entered in the Station's Corrective Action System.

**7.0 SIMILAR EVENTS**

None.

**8.0 ADDITIONAL INFORMATION**

Unit 2 was operating in Mode 1, 100 percent power, and was not affected by this event.