Thomas D. Gatlin
Vice President, Nuclear Operations
803.345.4342

April 28, 2011

SCE&G®
A SCANA COMPANY

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
SUPPLEMENTAL LICENSEE EVENT REPORT (LER 2010-002-01)
UNANALYZED CONDITION DUE TO WIRING DISCREPANCY IN THE "B" EMERGENCY DIESEL GENERATOR (EDG) APPENDIX R ISOLATION CIRCUITRY

Attached is Supplemental Licensee Event Report (LER) No. 2010-002-01 for the Virgil C. Summer Nuclear Station Unit 1. This report describes a wiring discrepancy which could have potentially affected the ability of the "B" EDG output breaker to automatically close during certain Appendix R fire scenarios when an undervoltage signal was present on the bus. Immediate corrective actions restored Appendix R capability. The report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B).

If you have any questions, please contact Mr. Bruce L. Thompson at (803) 931-5042.

Very truly yours,

Thomas D. Gatlin

WCM/TDG/jg

c: K. B. Marsh
S. A. Byrne
J. B. Archie
N. S. Carns
J. H. Hamilton
R. J. White
W. M. Cherry
V. M. McCree
R.E Martin
NRC Resident Inspector
M.N Browne
Paulette Ledbetter
D. L. Abstance
J.C. Mellette
EPIX Coordinator
K. M. Sutton
INPO Records Center
Marsh USA, Inc.
Maintenance Rule Engineer
NSRC
RTS (CR-10-01814)
File (818.07)
PRSF (RC-11-0070)

IE22
A006
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

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 Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Virgil C. Summer Nuclear Station Unit 1	05000 395	1 OF 3

4. TITLE

Unanalyzed condition due to wiring discrepancy in the "B" Emergency Diesel Generator Appendix R isolation circuitry

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	DOCKET NUMBER
										05000
04	29	2010	2010	- 2 -	1	04	28	2011	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

Mode 1

10. POWER LEVEL

100 %

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☑ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Bruce Thompson, Manager Licensing, Virgil C. Summer Nuclear Station Unit 1	(803) 931-5042

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

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ◉ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On April 29, 2010, VCSNS personnel identified a wiring discrepancy in the "B" EDG remote shutdown circuitry during field walkdowns. A conductor was found to be installed that effectively bypassed the Appendix R isolation function of a contact in the "B" EDG local/remote/maintenance switch. During certain fire scenarios, station procedures direct operators to take the local/remote/maintenance switch to local. One feature of taking the switch to local is to isolate the EDG output breaker automatic close circuitry from fires in the control building.

Immediate corrective actions were to remove the conductor, satisfactorily retest the isolation circuit, and restore Appendix R isolation capability. Three root causes were identified that relate to the historical design control program in effect at the time. The root causes are: 1) design change instructions that were not complete, 2) post modification testing that did not detect incomplete package implementation, and 3) a failure to implement the modification per the implementation package drawing. No new corrective actions were developed for the historical design implementation discrepancy as the current design control program provides sufficient guidance to prevent these root causes.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Virgil C. Summer Nuclear Station Unit 1	05000 395	2010	- 002	- 01	2 OF 3

NARRATIVE

PLANT IDENTIFICATION

Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION

XEG0001B-E, "B" Emergency Diesel Generator

IDENTIFICATION OF EVENT

On April 29, 2010, VCSNS personnel identified wiring discrepancies in the "B" EDG remote shutdown circuitry during field walkdowns.

EVENT DATE

April 29, 2010

Condition Report CR-10-01814 was written to address this event.

REPORT DATE

June 28, 2010

CONDITIONS PRIOR TO EVENT

Mode 1, 100% Power

DESCRIPTION OF EVENT

On April 29, 2010, VCSNS personnel identified a wiring discrepancy in the "B" EDG remote shutdown circuitry during field walkdowns. A conductor was found to be installed that effectively bypassed the Appendix R isolation function of contact 1-1C in the "B" EDG local/remote/maintenance switch. During certain fire scenarios, station procedures direct operators to take the local/remote/maintenance switch to local. One feature of taking the switch to local is to isolate the EDG output breaker automatic close circuitry from the Main Control Board manual close circuitry in the Control Building to satisfy the Appendix R isolation function.

With the conductor installed, the diesel generator output breaker may not have automatically closed during a fire when an undervoltage signal was present on the bus.

CAUSE OF EVENT

The cause of this deficiency was a design modification implemented in 1983 that did not contain sufficient information to remove the conductor. Modification Request Form (MRF)-10819 was initiated in 1983 to resolve an issue with the diesel generator local/remote/maintenance switch that prevented the Diesel Generator output breaker from closing. The disposition was to electrically jumper the local/remote/maintenance switch so that the breaker would close using the local switch regardless of the switch position. The directions in the disposition said to install jumpers as shown on the attached interim documents. The cable routing and termination sheets used to describe where to install the jumpers also included a "clouded" entry to spare the conductor that resulted in bypassing the Appendix R isolation function. No directions were provided to spare the jumper and no mention was made in the work documents that the conductor was removed. When the design package was closed out, the drawings were updated to show that the conductor was no longer installed.

A root cause analysis was conducted to identify the reason the EDG was allowed to be returned to service with the bypass jumper still installed. Three root causes were identified that relate to the historical design control program that was in effect at the time. The root causes are: 1) MRF instructions that were not complete, 2) post modification testing that did not detect incomplete package implementation, and 3) a failure to implement the modification per the implementation package drawing. No new

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Virgil C. Summer Nuclear Station Unit 1	05000 395	2010	- 002	- 01	3 OF 3

NARRATIVE

corrective actions were developed for these historical design modification issues since the design control program has improved over the years and the current design control program has sufficient guidance and controls to prevent issues such as these.

The Surveillance Test Procedure (STP)-170.021, "Fire Switch Functional Test for XEG0001B Diesel Generator B," was not capable of detecting the bypassed contact. The isolation feature of the circuit for the remote circuit in the Control Building is essentially accomplished by two contacts in series located on the local/remote/maintenance switch. The isolation feature requires both contacts to be opened to prevent fire induced shorts in the Control Building from potentially blowing the EDG breaker control power fuse. The Surveillance Test Procedure was written to verify that the functionality of the remote circuit was disabled when the switch was taken to local. The opening of either contact in the circuit would disable the remote circuit. Therefore, the circuit would pass the test without detecting the bypassed isolation contact.

The licensing bases for the Appendix R testing did not require verification of circuit isolation at the contact level. Fire protection STPs were written to test local controls (fire switches) per the guidance in NRC Generic Letter 81-12, "Fire Protection Rule." This testing was to verify that equipment operated locally and not remotely with the switch in local, and remotely but not locally with the switch in remote. Fire protection STPs as written do not detect failure of individual contacts required to provide Appendix R isolation.

ANALYSIS OF EVENT

"B" EDG local/remote/maintenance switch (43-DG02) contact 1-1C isolates a section of remote control circuitry from the local and automatic close circuitry for events where a fire in the Control Building requires Control Room evacuation. The conductor essentially bypassed contact 1-1C and therefore the Appendix R isolation function when the "B" EDG local/remote/maintenance switch was taken to local. The effect of bypassing this contact is that a section of the remote control circuitry would not be isolated from either the local or automatic close circuitry on a bus undervoltage, if a fire in the Control Building caused the need to take local control of the "B" EDG. If the section of remote control circuitry shorted during an Appendix R fire, control power to the automatic close circuitry on a bus undervoltage signal and the local control switch may potentially not be available.

The use of the "B" EDG local/remote/maintenance switch for Appendix R isolation is controlled by Fire Emergency Procedure (FEP) 4.0, "Control Room Evacuation Due To Fire." This procedure sends station operators to the Control Room Evacuation Panel, the "B" EDG room and the 1DB Switchgear Room. The operator in the "B" EDG room would place the "B" EDG local/remote/maintenance switch in local and would then coordinate with the licensed operator in the 1DB Switchgear Room to start the "B" EDG within 30 minutes. The procedure directs the licensed operator in the 1DB Switchgear Room to open the normal and emergency off-site power supply breakers which would then make up the automatic close circuitry for the "B" EDG output breaker. If control power to the automatic close circuitry was lost due to a fire induced short in the installed conductor, the "B" EDG output breaker would not have closed automatically. This condition is mitigated by procedural direction for the licensed operator in the 1DB Switchgear Room to verify that the breaker closed and, if it is not closed, to close the "B" EDG output breaker manually as provided for on the procedure reference page. Operators are routinely trained on locally closing breakers. With the licensed operator stationed in the 1DB Switchgear Room, this additional manual action would not have prevented meeting the 30 minute timeline for powering the 1DB bus from the "B" EDG.

CORRECTIVE ACTIONS

The conductor has been removed, and Appendix R isolation capability has been restored. Troubleshooting plans have been developed and are being implemented along with the STPs to verify that Appendix R fire switches are functional at the contact level. The testing will be complete prior to startup after Refueling Outage 19, which is currently in progress.

PRIOR OCCURRENCES

There have been no prior occurrences of this event.