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Energy to Serve Your WorldSM

LCV-1566

October 22, 2001

Docket No.: 50-424

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Ladies and Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
LICENSEE EVENT REPORT 1-01-001
REACTOR TRIP DUE TO LOSS OF GENERATOR EXCITATION

In accordance with the requirements of 10 CFR 50.73, Southern Nuclear Operating Company hereby submits a Vogtle Electric Generating Plant licensee event report for a condition that occurred on Unit 1 on August 24, 2001.

Sincerely,

J. B. Beasley, Jr.

JBB/JPC

Enclosure: LER 1-2001-001

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser
Mr. M. Sheibani
SNC Document Management

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. Ramin R. Assa, Vogtle Project Manager, NRR
Mr. J. Zeiler, Senior Resident Inspector, VEGP

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NRC FORM 366 (6-1998)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED OMB NO. 3150-0104 EXPIRES: 06/30/2001 Estimated burden per response to comply with this mandatory information request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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)											
FACILITY NAME (1) Vogtle Electric Generating Plant - Unit 1						DOCKET NUMBER (2) 0 5 0 0 0 4 2 4		PAGE (3) 1 OF 4			
TITLE (4) REACTOR TRIP DUE TO LOSS OF GENERATOR EXCITATION											
EVENT DATE (5) MONTH DAY YEAR 0 8 2 4 2 0 0 1			LER NUMBER (6) YEAR SEQUENTIAL NUMBER REVISION NUMBER 2 0 0 1 0 0 1 0 0			REPORT DATE (7) MONTH DAY YEAR 			OTHER FACILITIES INVOLVED (8) FACILITY NAME DOCKET NUMBER 0 5 0 0 0 FACILITY NAME DOCKET NUMBER 0 5 0 0 0		
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR *: (Check one or more) (11)									
POWER LEVEL (10) 1 0 0		20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)			
		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)			
		20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71			
		20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER			
		20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below			
		20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		or in NRC Form 366A			
LICENSEE CONTACT FOR THIS LER (12)											
NAME Mehdi Sheibani, Nuclear Safety and Compliance						TELEPHONE NUMBER (include area code) 7 0 6 - 8 2 6 - 3 2 0 9					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
B	T L	S C R	G 0 8 0	Y							
SUPPLEMENTAL REPORT EXPECTED (14) X YES (If yes, complete EXPECTED SUBMISSION DATE) NO						EXPECTED SUBMISSION DATE (15) 0 1 3 1 2 0 0 2					
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16) <p>On August 24, 2001, with the unit at 100% power, personnel were returning to service the Main Generator Rectifier Bridge 1 after performing corrective maintenance. Upon closure of the disconnect switch, a trip of the main generator occurred on loss of field excitation, causing an automatic turbine/reactor trip at 2307 EDT. All control rods were observed to fully insert, and control room operators acted properly to control steam generator water levels and stabilize the unit in mode 3 (hot standby).</p> <p>An investigation found that, upon returning Rectifier Bridge 1 to service, silicon controlled rectifiers (SCRs) in Rectifier Bridge 4 failed due to a short circuit. This led directly to the loss of the generator excitation field and the generator/turbine/reactor trip. The malfunctioning rectifier bridges were repaired and the unit was returned to service. The failed SCRs that were removed from the rectifier bridges are being sent to a laboratory for failure analysis. Additional follow-up actions may be taken based on the results of the analysis.</p>											

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TEXT (If more space is required, use additional copies of NRC Form 366A)(17)

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.72 (a)(2)(iv) because an unplanned actuation of the reactor protection system occurred.

B. UNIT STATUS AT TIME OF EVENT

At the time of this event, Unit 1 was operating in Mode 1 (power operation) at 100% of rated thermal power. The generator was operating with Rectifier Bridge 1 out of service and Rectifier Bridges 2, 3 and 4 in service.

C. DESCRIPTION OF EVENT

Following a lightning strike on the unit's 230 kV line on August 18, 2001, anomalies were found on phase A silicon controlled rectifiers (SCRs) of the main generator Rectifier Bridge 1 in the form of failed LEDs and resistors. Upon removing Rectifier Bridge 1 from service for repairs, an anomaly (flickering LEDs) began to occur on phase C of Rectifier Bridge 2 due to a voltage imbalance. Following consultation with the generator vendor, it was decided to repair Bridge 1, return it to service, then remove Bridge 2 from service for repair.

On August 24, 2001, after repairing Rectifier Bridge 1, personnel were placing the bridge back in service in accordance with procedure 13830-1, "Main Generator Operation." Upon closure of the disconnect switch for Rectifier Bridge 1, a trip of the main generator occurred on loss of field excitation, causing an automatic turbine/reactor trip at 2307 EDT. The first-out annunciator seen by operators in the control room was "Turbine Trip/P-9 Reactor Trip." All control rods were observed to fully insert, and a main feedwater system isolation (FWI) and an auxiliary feedwater system (AFW) actuation occurred as expected. Control room operators acted properly to control steam generator water levels and stabilize the unit in mode 3 (hot standby).

D. CAUSE OF EVENT

An investigation found that, upon returning Rectifier Bridge 1 to service, both phase A SCRs failed in Bridge 4 due to a short circuit. This led directly to the loss of generator excitation field and the generator/turbine/reactor trip. Several possible reasons for the short circuit have been proposed, and

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the failed SCRs have been sent to a laboratory for failure analysis. When a root cause is determined, a revised LER will be submitted.

E. ANALYSIS OF EVENT

The reactor protection system, the main feedwater isolation function, and the auxiliary feedwater actuation function performed as designed. Control room operators acted properly to control steam generator water levels and stabilize the unit in mode 3 (hot standby). Based on these considerations, there was no adverse effect on plant safety or on the health and safety of the public as a result of this event.

This event does not represent a safety system functional failure.

F. CORRECTIVE ACTIONS

- 1) Rectifier bridges were repaired and the unit was returned to service.
- 2) By December 15, 2001, the generator vendor will submit additional design information and recommendations for testing, operation, life expectancy, and preventive maintenance of the involved generator components. Procedure and training requirements will be revised as appropriate.
- 3) The failed SCRs are being sent to a testing laboratory for failure analysis. A report on the cause of the failures is expected by December 15, 2001. Additional follow-up actions may be taken based on the investigation results.

G. ADDITIONAL INFORMATION

- 1) Failed Components:
Silicon Controlled Rectifiers manufactured by General Electric Corporation
Part # 44C338754G01

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2) Previous Similar Events:

LER 5000425/1991-007-00, dated June 4, 1991. This LER described a generator/turbine/reactor trip caused by problems with the generator control circuits.

3) Energy Industry Identification System Code:

Main Generator System - TB
Main Generator Excitation System - TL
Reactor Control System - JD
Main Feedwater System - SJ
Auxiliary Feedwater System - BA