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April 13, 2004



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NL-04-0615

Docket Nos.: 50-321  
50-366

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant  
Licensee Event Report  
Water Intrusion into Relay Panel 2H21-P232  
Results in the Start of "2C" Emergency Diesel Generator

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv)(A), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning the water intrusion into relay panel 2H21-P232 resulting in the start of the "2C" emergency diesel generator.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

A handwritten signature in cursive script that reads "Lewis Sumner".

H. L. Sumner, Jr.

HLS/IL/daj

Enclosures: LER 50-366/2004-001

cc: Southern Nuclear Operating Company  
Mr. J. B. Beasley, Jr., Executive Vice President  
Mr. G. R. Frederick, General Manager – Plant Hatch  
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. C. Gratton, NRR Project Manager – Hatch  
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

JE22

**LICENSEE EVENT REPORT (LER)**

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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,

1. FACILITY NAME  
Edwin I. Hatch Nuclear Plant - Unit 2

2. DOCKET NUMBER  
05000-366

3. PAGE  
1 OF 5

4. TITLE  
Water Intrusion into Relay Panel 2H21-P232 Results in the Start of the "2C" Emergency Diesel Generator

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
2	18	2004	2004	001	0	04	13	2004		05000
									FACILITY NAME	DOCKET NUMBER(S)
										05000

9. OPERATING MODE (9)	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)										
1	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)							
10. POWER LEVEL 98.8	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)							
	20.2203(a)(1)	50.36(c)(1)(i)(A)	X 50.73(a)(2)(iv)(A)	73.71(a)(4)							
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)							
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER							
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A							
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)								
	20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)								
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)								
	20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)								

12. LICENSEE CONTACT FOR THIS LER  
 NAME: Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch  
 TELEPHONE NUMBER (Include Area Code): (912) 537-5880

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	MONTH	DAY	YEAR		
	X					

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

On 2/18/2004 at 1547 ET, Unit 2 was in the Run mode at a power level of approximately 2772 CMWT (98.8% rated thermal power). At that time, an 8 inch Plant Service Water (PSW) pipe was being cut in support of implementation of a planned design change. Despite precautions taken some water drained onto the Unit 2 '2C' Emergency Diesel Generator (DG) relay panel 2H21-P232 which caused the '2C' DG to start from an apparent invalid signal. The DG did not tie to the bus, and the bus remained energized throughout the event. Licensed Operations personnel shut down the DG by 1604 ET on 2/18/2004, and the DG's mode switch was left in the test position until the completion of trouble shooting activities.

This event resulted from personnel failing to anticipate the volume of water that could be released from the pipe cut due to the combination of the pipe configuration and sediment build-up in the pipe. A contributing cause was failure to protect relay panel 2H21-P232 from any potential water damage. Troubleshooting and repair activities were completed; and the Operability Surveillance (34SV-R43-006-2S, DIESEL GENERATOR 2C SEMI-ANNUAL TEST) was completed on 2/20/2004 at 0505 ET. Procedural guidance is being incorporated into the appropriate plant procedures to ensure that electrical equipment is protected when breaching nearby systems.

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

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor  
Energy Industry Identification System codes appear in the text as (EIIS Code XX).

DESCRIPTION OF EVENT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor  
Energy Industry Identification System codes are identified in the text as (EIIIS Code XX).

DESCRIPTION OF EVENT

On 2/18/2004 at 1547 ET, Unit 2 was in the Run mode at a power level of approximately 2772 CMWT (98.8% rated thermal power). An 8-inch pipe cut on the Plant Service Water (PSW, EIIS Code BI) system was made during the implementation of Design Change Request (DCR) 03-026T. Piping downstream of the cut area was degraded. The DCR required removal of a section of pipe, capping the upstream side, and abandoning the degraded downstream piping. The cut area was located approximately 12 ft. above the floor and was directly over a cable tray in the 2G switchgear room.

In preparation for the pipe cut, a clearance boundary was established and protective measures were taken to prevent water damage to surrounding equipment. The cut was made by an air-driven cutting tool. As the cut was nearly completed, the pipe shifted. The volume of water release was more than anticipated and traveled beyond the area prepared to handle water.

Investigation revealed that the trapped water was not fully drained from the piping. Personnel failed to realize that a combination of sediment build-up and a piping section without a drain could trap a considerable volume of water in the pipe. As a precaution, pipefitters had drilled a hole in the top of the 8-inch pipe close to the cut location; however, because the hole was located in the portion of the pipe being discarded, the area available for inspection was downstream of the cut. Upstream of the inspection hole there was a sediment build-up resulting in trapped water. The pipe appeared dry when it was inspected through the drilled hole. When the cut was made, the pipe moved and the trapped water was released. Although the electrical equipment directly beneath the cut was covered and adequately protected from water, the adjacent electrical equipment was not protected because the amount of water anticipated was underestimated.

Water from the cut traveled along cable trays and scaffold boards and drained onto surrounding panels and junction boxes. Panel 2H21-P232 (the '2C' Emergency Diesel Generator Relay Panel), received enough water to cause an auto-start of the '2C' DG (EDG, EIIS Code EK). Additionally, a Generator

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

Field Ground and a Battery Malfunction alarm (caused by a DC distribution ground) were both received. The water flow stopped after an estimated 30 to 50 gallons had drained from the pipe cut.

The 2H21-P232 panel contains '2C' DG control logic. There are six contacts located in this panel that if shorted by water would start the DG. During this event the normal supply breaker to the bus did not trip and the bus remained energized. The '2C' DG did not tie to the bus. Licensed Operations personnel shut down the DG by 1604 ET, and the DG's mode switch was left in the test position. Troubleshooting and repair activities were completed; and the Operability Surveillance (34SV-R43-006-2S, DIESEL GENERATOR 2C SEMI-ANNUAL TEST) was completed on 2/20/2004 at 0505 ET.

It was concluded from the event that at least one of the start contacts for '2C' DG were shorted by the water intrusion causing an invalid start signal to be generated resulting in the '2C' DG starting. Additionally, since the DG's control switch could be taken to and maintained in the test position, the LOCA relays were not initiating a start signal to the DG and no LOCA signal was received.

Recovery from the PSW intrusion into the '2C' DG control panel (2H21-P232) involved drying out the panel, inspecting the HGA and HFA relays in the panel associated with the DG start logic and load shed logic. Relays were dried, calibrated, repaired, or replaced as required. No water was found during the inspection of the 6 HGA and 14 HFA relays. When relay 2R43-K770 was removed from its housing and the housing dried out the DC distribution ground and Field ground cleared.

After all recovery actions were completed, the '2C' DG was functionally tested by performing the DG quick start test. This test most closely approximates an automatic start of the DG.

CAUSE OF EVENT

Personnel failed to anticipate the water that could be released from the pipe cut because the combination of pipe configuration and sediment build-up was not considered. A contributing cause of the event was the failure to protect all electrical equipment from water damage. At the time the pipe was cut, water drained onto 2H21-P232 ('2C' Relay Panel) from the 8-inch PSW pipe being cut shorting an undervoltage relay causing an invalid signal to start the '2C' DG.

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

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because an automatic actuation of a system listed in paragraph (a)(2)(iv)(B)(8) occurred. Specifically, the '2C' DG automatically started from an invalid signal when water drained onto the 2H21-P232 relay panel.

The Unit 2 Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate), and the onsite standby power sources (DGs '2A', '2C', and '1B'). As required by 10 CFR 50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems. The Class 1E AC distribution system is divided into redundant load groups, so loss of any one group does not prevent the minimum safety functions from being performed. Each load group has connections to two preferred offsite power supplies and a single DG. Offsite power is supplied to the 230 kV and 500 kV switchyards from the transmission network by eight transmission lines. From the 230 kV switchyards, two electrically and physically separated circuits provide AC power, through startup auxiliary transformers 2C and 2D, to 4.16 kV ESF buses 2E, 2F, and 2G.

Startup auxiliary transformer (SAT) 2D provides the normal source of power to the ESF buses 2E, 2F, and 2G. If any 4.16 kV ESF bus loses power, an automatic transfer from SAT 2D to SAT 2C occurs. The onsite standby power source for 4.16 kV ESF buses 2E, 2F, and 2G consists of three DGs. DGs '2A' and '2C' are dedicated to ESF buses 2E and 2G, respectively. DG '1B' (the swing DG) is a shared power source and can supply either Unit 1 ESF bus 1F or Unit 2 ESF bus 2F. A DG starts automatically on a loss of coolant accident (LOCA) signal (i.e., low reactor water level signal or high drywell pressure signal) or on an ESF bus degraded voltage or undervoltage signal. After the DG has started, it automatically ties to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with a LOCA signal.

In this event, it was concluded that at least one of the start contacts for '2C' DG was shorted by the water intrusion causing an invalid start signal to be generated resulting in the '2C' DG starting. The DG did not tie to the bus and was not required to. The bus remained energized throughout the event. There were no other equipment actuations associated with this event. The DG performed as designed given the invalid start signal introduced by the water intrusion into the relay panel.

During this event the '2A' and '1B' DGs were available for Unit 2. With the '2C' DG inoperable, the plant entered Technical Specifications LCO 3.8.1, Condition B. Required Action B.4 requires, in part, the DG be restored to operable status within 72 hours. The TS Bases for this Required Action states that Regulatory Guide 1.93 provides guidance that operation in Condition B. may continue for 72 hours. .

Based on this analysis, it is concluded that this event did not adversely affect nuclear safety.

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

CORRECTIVE ACTIONS

Troubleshooting and repair activities were completed; and the Operability Surveillance (34SV-R43-006-2S, DIESEL GENERATOR 2C SEMI-ANNUAL TEST) was completed on 2/20/2004 at 0505 ET.

The personnel involved in determining that the PSW line was isolated and free from water were made aware of their error and the consequences of it.

Additional procedural guidance is being incorporated into the appropriate plant procedures to ensure that electrical equipment is protected when breaching nearby systems. These procedure revisions will be completed by June 2004.

ADDITIONAL INFORMATION

No systems other than those previously described in this report were affected by this event.

This LER does not contain any permanent licensing commitments.

There were no previous similar events reported in the past two years in which an automatic actuation of a system listed in paragraph (a)(2)(iv)(B)(8) occurred because of inadequate equipment protection when breaching a system.

Cause Code: A