Dennis R. Madison
Vice President - Hatch

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SOUTHERN COMPANY

July 19, 2009

Docket No.: 50-321

NL-09-0993

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

Edwin I. Hatch Nuclear Plant
Licensee Event Report
IRM Signal Spike Caused by Electrical
Noise Results in Reactor Scram

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 a reactor scram resulting from electrical noise on an Intermediate Range Monitor.

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

Sincerely,

D. R. Madison
Vice President – Hatch

DRM/MJK/

Enclosure: LER 1-2009-004

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Ms. P. M. Marino, Vice President – Engineering
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Hatch
Mr. J. A. Hickey, Senior Resident Inspector – Hatch

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: 50 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)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Edwin I. Hatch Nuclear Plant Unit 1	05000 321	1 OF 3

4. TITLE

IRM Signal Spike Caused by Electrical Noise Results in Reactor Scram

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
5	10	2009	2009	- 004 -	0	06	19	2009	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

1

10. POWER LEVEL

008

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)
Edwin I. Hatch / Kathy Underwood, Performance Improvement Supervisor	912-537-5931

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 May 10 at 1041 EDT, Unit 1 was in run at 224 CMWT, 8 percent power. At this time a reactor startup from a planned maintenance outage was in progress. Upon placing the reactor mode switch to the run mode as part of normal startup activities, a full reactor scram was initiated. Intermediate Range Neutron Monitoring (IRM) upscale trips were received in each of the two Reactor Protection System (RPS) scram channels. Investigation revealed that the '1A' IRM (Bus A) and the '1H' IRM (Bus B) had spiked upscale when the mode switch was taken to run.

The cause of the scram was an electrical noise spike transmitted into the IRM's. The noise signal was sufficient to cause IRM "A" and "H" to trip on "high-high" neutron flux level.

Replacing degraded cables, and connections, as well as improving grounding of the neutron monitoring system improved noise levels in the system. In addition ferrite beads were installed on each cable entering and/or exiting the preamplifier NEMA enclosures on each of the eight IRM channels.

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

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

On May 10 at 1041 EDT, when the Unit 1 reactor mode switch was taken to the run mode following a planned maintenance outage a full reactor Scram was initiated. The following alarms were received in conjunction with the Reactor Scram: "IRM BUS A UPSCALE TRIP OR INOP", "IRM BUS B UPSCALE TRIP OR INOP" and "IRM UPSCALE". Investigation revealed that the '1A' IRM (Bus A) (EIIS Code IG) and the '1H' IRM (Bus B) had spiked upscale when the mode switch was taken to run, resulting in a reactor scram. The plant had been experiencing increased noise on the IRM's since the morning of May 6, 2009. Multiple corrective actions had taken place to reduce and eliminate noise on the IRM's which had been experienced with plant component manipulations prior to the startup and subsequent scram.

CAUSE OF EVENT

The cause of the scram was an electrical noise spike transmitted into the IRM's. The noise signal was sufficient to cause IRM "A" and "H" to trip on "high-high" neutron flux level.

The scram occurred simultaneously with the movement of reactor mode switch from "Start-Up" to "Run". Post-incident testing revealed that IRM noise spikes were being induced by RPS (EIIS Code JC) relay actuations which generated electro-magnetic interference (EMI). It is concluded that noise induced spikes from the RPS relay actuations caused the scram.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable in accordance with 10 CFR 50.73 (a)(2)(iv)(A), which requires the licensee to report any event or condition that resulted in a manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

The IRM scram function provides for reactor protection during startup, shutdown, and low power operations. Because the IRM "high-high" neutron flux trips were due to electrical noise introduced to the instrumentation, no actual over power event occurred. The safety function of the IRM's was not diminished. There were no safety consequences as a result of this event. All control rods (EIIS Code AA) inserted and plant systems operated as expected following the scram. There were no systems or components inoperable during the event that could have contributed to the event. The reactor scram posed no safety consequences to the health and safety of the general public or plant personnel.

Based on this analysis, it is concluded that this event had no adverse impact on nuclear safety. This analysis is applicable to all power levels and operating modes in which a LOCA is postulated to occur.

CORRECTIVE ACTIONS

Extensive investigation and repair activities to correct degraded cables and connections and to improve the grounding of the neutron monitoring system improved the noise response of the IRMs.

The plant installed five ferrite beads (Fair-Rite Type 31 material) on each cable entering and/or exiting the preamplifier NEMA enclosures on each of the eight IRM channels. These ferrite beads were positioned in close proximity to the preamplifiers. The ferrite bead works to add common mode impedance to IRM cables, thereby causing EMI to be reflected toward its source. The ferrite bead responds to the magnetic field produced by the common mode current carried on the conductors within the ferrite bead. The ferrite bead does not affect the differential mode signal (current) within the cable on which the ferrite bead was placed.

Post-installation testing prior to restart demonstrated that noise spikes from RPS relay actuations into the IRM instruments were of much lower amplitude.

ADDITIONAL INFORMATION

Other Systems Affected: None

Failed Components Information: None

Commitment Information: This report does not create any new permanent licensing commitments.

Previous Similar Events:

There are no similar events within the past two years in which a reactor scram was initiated due to electrical noise spike on the nuclear instrumentation.