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Southern Nuclear Operating Company

the southern electric system

J. D. Woodard
Vice President
Farley Project

June 11, 1992

10 CFR 50.73

Docket No. 50-364

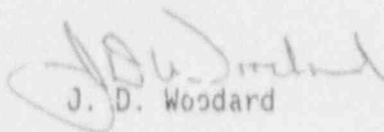
U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 2
Licensee Event Report No. LER 92-006-00

Gentlemen:

Joseph M. Farley Nuclear Plant, Unit 2, Licensee Event Report No. LER 92-006-00 is being submitted in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,


J. D. Woodard

JDW/EFB:map 2582

Enclosure

cc: Mr. S. D. Ebnetter
Mr. G. F. Maxwell

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Joseph M. Farley Nuclear Plant - Unit 2 DOCKET NUMBER (2) 05000364 PAGE (3) 1 of 4

TITLE (4) Reactor Trip Caused By Blown Control Power Fuses In Two Of Four Power Range Nuclear Instruments

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQ NUM	REV	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)	
05	15	92	92	006	00	06	11	92		05000	
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)											

OPERATING MODE (9)	POWER LEVEL	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)(A)	50.73(a)(2)(vii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below)
1	35										X										

LICENSEE CONTACT FOR THIS LER (12)
 NAME: R. D. Hill, General Manager - Nuclear Plant
 TELEPHONE NUMBER: 205 899-5156

COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRPDS

SUPPLEMENTAL REPORT EXPECTED (14)
 YES (If yes, complete EXPECTED SUBMISSION DATE) NO
 EXPECTED SUBMISSION DATE (15)

ABSTRACT (16)

At 2004 on 5-15-92, while operating at approximately 35 percent power, a reactor trip occurred when the control power fuses for power range NI-41 and NI-43 blew. During the performance of FNP-2-STP-121, "Power Range Axial Offset Calibration," DVMS with unshielded leads were connected to the precision input resistors for each top and bottom detector in the four power range NI drawers. The use of unshielded leads on the DVMS allowed a 60 hertz signal to be superimposed on the normal DC signal from the power range detectors in the NIS. Because the plant power level (approximately 35 percent) was at a power permissive setpoint, the superimposed signal caused the bistable SCRs to rapidly turn on and off. This cycling action caused increased current through the control power fuses of the power range NIs. The high current caused the control power fuses to heat up and subsequently blow for NI-41 and NI-43. The NI-43 fuse blew approximately 9 seconds before the NI-41 fuse blew. The loss of control power to the two power range NIs caused the reactor trip.

This event was caused by procedural inadequacy. STP-121 for both units has been revised to allow instrumentation in only one power range drawer at a time during the performance of the surveillance. Furthermore, the procedure was revised to require the use of shielded cables for connecting test instrumentation to prevent induced voltages from affecting NIS performance.

Following the trip, the operators maintained the unit in a stable condition.

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TEXT

Plant and System Identification

Westinghouse - Pressurized Water Reactor
Energy Industry Identification System codes are identified in the text as [XX].

Summary of Event

At 2004 on 5-15-92, while operating at approximately 35 percent power, a reactor trip occurred when the control power fuses for power range NI-41 and NI-43 blew. During the performance of FNP-2-STP-121, "Power Range Axial Offset Calibration," DVMs with unshielded leads were connected to the precision input resistors for each top and bottom detector in the four power range NI drawers. The use of unshielded leads on the DVMs allowed a 60 hertz signal to be superimposed on the normal DC signal from the power range detectors in the NIS. Because the plant power level (approximately 35 percent) was at a power permissive setpoint, the superimposed signal caused the bistable SCRs to rapidly turn on and off. This cycling action caused increased current through the control power fuses of the power range NIs. The high current caused the control power fuses to heat up and subsequently blow for NI-41 and NI-43. The NI-43 fuse blew approximately 9 seconds before the NI-41 fuse blew. The loss of control power to the two power range NIs caused the reactor trip.

Description of Event

On 5-15-92 at 2004, the unit was operating at approximately 35 percent power. FNP-2-STP-121, "Power Range Axial Offset Calibration," was in progress. As a part of the STP-121 test instrumentation, eight digital voltmeters were connected to normal test points across the precision input resistors for each top and bottom detector in the four power range NI drawers [1G]. STP-121 had been recently revised to allow the use of DVMs as an enhancement to installed analog meters to obtain more accurate data.

With power at approximately 35 percent, bistables in the NIS corresponding to a 35 percent power permissive setpoint became energized. Because the leads on the eight DVMs were unshielded, a 60 hertz signal was inadvertently superimposed on the normal DC signal from the power range detectors. This superimposed signal, when amplified by the instrument drawer, caused the bistable SCRs to rapidly turn on and off. This cycling action caused an increased current to be seen by the control power fuses of the power range NIs. The resulting high current caused the control power fuses to heat up and subsequently blow for NI-41 and NI-43. The fuse for NI-43 blew approximately 9 seconds before the fuse for NI-41. This loss of two of four power range NIs caused the reactor trip.

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Following the trip, the operators implemented FNP-2-EEP-0, "Reactor Trip or Safety Injection," and FNP-2-ESP-0.1, "Reactor Trip Response," ensuring that the unit was safely in Mode 3. The unit was maintained in a stable condition.

The unit returned to power operation at 1743 on 5-16-92.

Cause of Event

This event was caused by procedural inadequacy. The procedure did not prohibit DVMS from being connected to all four power range NI drawers at the same time. It also did not specify the use of shielded leads for equipment connected to the power range nuclear instrumentation. STP-121 had been recently revised to allow the use of DVMS to obtain more accurate data; however, the procedure revision review failed to identify the need for a caution statement to prohibit connecting test equipment to more than one power range NI at a time. The procedure revision review also failed to identify the possibility of induced voltages on input leads causing increased currents through control power fuses at certain permissive setpoints.

Reportability Analysis and Safety Assessment

This event is reportable because of the situation of the reactor protection system. After the trip the following safety systems operated as designed:

- main feedwater was isolated by automatic closure of the flow control valves and bypass valves,
- auxiliary feedwater pumps started automatically and provided flow to the steam generators,
- source range nuclear detectors did not re-energize automatically due to the high voltage being interlocked off by the de-energized power range channels NI-41 and NI-43,
- pressurizer heater and spray valves operated automatically as required to maintain reactor coolant system pressure.

There was no effect on the health and safety of the public.

Corrective Action

All control power fuses for the four power range NIs were replaced. STP-121 for both units has been revised to allow instrumentation to be connected to only one power range drawer at a time during the performance of the surveillance. Furthermore, the procedure was revised to require the use of shielded leads for connecting test instrumentation to prevent induced voltages from affecting NIS performance.

**LICENSEE EVENT REPORT (LER)
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Additional Information

No similar LERs have been submitted by Farley Nuclear Plant.

Fuses were replaced in NI-41 at 2020 on 5-15-92 to re-energize the source range instrumentation.

Following the reactor trip, the NRC Operations Center was notified at 2053 by land line due to failure of the ENS. The ENS was returned to operable status at 2140 on 5-15-92.

This event would not have been more severe if it had occurred under a different operating condition.