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Energy to Serve Your World™
NL-04-0938

Docket No.: 50-364

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

Joseph M. Farley Nuclear Plant – Unit 2
Licensee Event Report 2004-004-00
Reactor Trips Due to Unblocking of Source Range Permissive Interlock

Ladies and Gentlemen:

Joseph M. Farley Nuclear Plant – Licensee Event Report (LER) No. 2004-004-00 is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A).

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

Sincerely,

A handwritten signature in black ink, appearing to read "L. M. Stinson".

L. M. Stinson

LMS/WAS/sdl

Enclosure: Licensee Event Report 2004-004-00

cc: Southern Nuclear Operating Company
Mr. J. B. Beasley, Jr., Executive Vice President
Mr. D. E. Grissette, General Manager – Plant Farley
RTYPE: CFA04.054; LC# 14045

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. S. E. Peters, NRR Project Manager – Farley
Mr. C. A. Patterson, Senior Resident Inspector – Farley

JE22

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1) Joseph M. Farley Nuclear Plant - Unit 2	DOCKET NUMBER (2) 05000364	PAGE (3) 1 OF 4
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TITLE (4) Reactor Trips Due to Unblocking of Source Range Permissive Interlock

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
04	11	2004	2004	- 004	- 00	06	04	2004	FACILITY NAME	DOCKET NUMBER	
OPERATING MODE (9)		2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)								
POWER LEVEL (10)		00	20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
			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 Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)		
			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)		

LICENSEE CONTACT FOR THIS LER (12)

NAME D. E. Grissette, General Manager Nuclear Plant	TELEPHONE NUMBER (include Area Code) 334-899-5156
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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
X	JC	RLY	W120	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On April 11, 2004, at 1105, with Unit 2 at zero power critical conditions, the reactor tripped due to a logic failure unblocking the B Train Source Range High Flux Trip (P-6 interlock) which allowed a Source range high flux reactor trip signal to be generated from the B Train source range detector. Solid State Protection System (SSPS) power supply cards were verified to be acceptable through testing. However, based on symptoms identified during trouble shooting efforts and SSPS testing, three suspect cards were identified. As a result of bench testing, two cards (A408 and A411) were replaced. B Train SSPS surveillance was conducted satisfactorily. The Unit 2 reactor subsequently achieved criticality at 0315 on April 12, 2004. Thirty minutes after the P-6 interlock was initiated, the reactor tripped again at 0347. Extensive investigation identified an intermittently failing universal logic card (A406).

Both reactor trip events were due to an intermittent failure of universal logic card (A406) in the B Train Solid State Protection System (SSPS). The card failure was due to an increased sensitivity to heat believed to be the result of aging. The card was found to be overly sensitive to ambient temperature changes after energization of the Source Range Trip Block (P-6 interlock).

The failed card (A406) was replaced as well as other applicable cards (A408 and A411 were replaced again as a conservative measure) in the P-6 interlock circuit. The equipment reliability plan associated with the 7300 system will be revised by November 30, 2004 to incorporate SSPS card failure and aging issues identified during this event.

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

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

Description of Event

On April 11, 2004, at 1105, with Unit 2 at zero power critical conditions, the reactor tripped due to a logic failure unblocking the B Train Source Range High Flux Trip (P-6 interlock) which allowed a Source range high flux reactor trip signal to be generated from B Train source range detector. The A Train Reactor Trip Breaker did not automatically open and was manually opened by the operator. Post mortem indication revealed the reactor trip was due to the reset of the B Train source range block which resulted in the reenergization of source range channel N32. Once the source range block of N32 was reset, N32 experienced neutron flux higher than the trip set point and generated a B Train reactor trip signal.

The source range block on N31 remained intact and therefore no A Train source range trip signal was generated. Thus, the A Train Reactor Trip Breaker remaining closed was an expected condition.

Symptoms indicated a failure in the B Train SSPS[JC]. Engineering analysis of symptoms identified three potential suspect logic cards. Surveillance and bench testing were performed to identify failed cards from the suspect population. SSPS power supply cards were verified to be acceptable through testing. As a result, two cards (A408 and A411) indicating functional problems were replaced. B Train SSPS surveillance was conducted satisfactorily.

On April 12, 2004 the Unit 2 reactor was restarted. Approximately 30 minutes after blocking the source range high flux trip as a part of the normal startup sequence, the reactor tripped again with similar symptoms and system response.

Subsequent engineering analysis and troubleshooting was conducted. A special test procedure was developed and performed to provide a simulated Source Range input into the SSPS logic circuitry, while monitoring critical points in the logic circuit. No failures were identified. Source Range and Intermediate Range flux detectors were tested satisfactorily. SSPS surveillance testing was performed with no problems observed.

The special test procedure was conducted a second time with the SSPS cabinet doors closed which more closely reflects the conditions actually experienced during normal operation. A few hours into this test, while monitoring critical logic circuitry points, the Source Range P-6 interlock was found to have changed state. Additional testing with the cabinet doors closed was capable of recreating the intermittent card failure. The card (A406) which experienced the intermittent failure had previously been tested satisfactorily following the first reactor trip.

When the Source Range High Flux Trip is blocked (P-6 Interlock), circuits on the card are energized, thus increasing the temperature of the card. Bench testing of the defective card using an external heat

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

source confirmed that the failure came in as the card temperature increased. A review of work order history and of card components indicated that the card (A406) had components manufactured as early as 1974 and as late as 1985. The failed card (A406), as well as other cards (A408 and A411) in the source range high flux trip (P-6 interlock) were replaced. The special test procedure was conducted again simulating actual cabinet temperature. No problems were observed. SSPS surveillances were conducted to confirm proper functions.

Following a thorough review of investigative results and corrective measures, Unit 2 reactor was restarted.

Cause of Event

Both reactor trip events were due to an intermittent failure of universal logic card (A406) in the B Train Solid State Protection System (SSPS). The card failure was due to an increased sensitivity to heat believed to be the result of aging. The card was found to be overly sensitive to ambient temperature changes after energization of the Source Range Trip Block (P-6 interlock).

Safety Assessment

All safeguards equipment functioned as designed following both trips.

The logic circuit failure in the B Train SSPS resulted in an inappropriate safety function actuation and did not result in the loss of a train of safety function.

The health and safety of the public were unaffected by this event.

This event does not represent a Safety System Functional Failure.

Corrective Action

The failed card (A406) was replaced as well as other applicable cards (A408 and A411) in the P-6 interlock circuit.

The equipment reliability plan associated with the 7300 system will be revised by November 30, 2004 to incorporate SSPS card failure and aging issues identified during this event.

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

Additional Information

The following LER has been submitted in the past two years regarding aging of electronic circuits.

LER 2004-001-00 Unit 1, Reactor Trip Due to Steam Generator Feedwater Pump Speed Control Failure.