



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

Serial: HNP-04-081
10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2004-003-00

Ladies and Gentlemen:

The enclosed Licensee Event Report 2004-003-00 is submitted in accordance with 10 CFR 50.73. This initial report describes an automatic reactor trip – turbine trip. Event Notification EN# 40730 previously reported this event in accordance with 10 CFR 50.72.

Please refer any questions regarding this submittal to Mr. John Caves, Supervisor - Licensing/Regulatory Programs, at (919) 362-3137.

Sincerely,

A handwritten signature in cursive script that reads "Ben Waldrep". Below the signature, the text "for Ben Waldrep" is written in a similar cursive style.

B. C. Waldrep
Plant General Manager
Harris Nuclear Plant

BCW/kmh

Enclosure

c: Mr. R. A. Musser (HNP Senior NRC Resident)
Mr. C. P. Patel (NRC-NRR Project Manager)
Mr. W. D. Travers (NRC Regional Administrator, Region II)

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P. O. Box 165
New Hill, NC, NC 27562

JE22

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME Harris Nuclear Plant – Unit 1	2. DOCKET NUMBER 05000400	3. PAGE 1 OF 3
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4. TITLE
Automatic Reactor Trip Due to Rod Control Card Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	06	2004	2004	- 003 - 00		07	02	2004		

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check all that apply)									
10. POWER LEVEL 100	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)						

12. LICENSEE CONTACT FOR THIS LER

NAME John Yadusky – Licensing	TELEPHONE NUMBER (Include Area Code) (919) 362-2020
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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
B	AA	ECBD	Westinghouse	Y					

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

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

On May 6, 2004 at 12:52 PM EDT, the reactor automatically tripped from 100% power due to a power range flux rate signal. The operations staff responded to the event in accordance with applicable plant procedures. The plant was stabilized at normal operating no-load reactor coolant system (RCS) temperature and pressure following the reactor trip.

The trip was caused by the failure of a regulation card in the Rod Control System [AA]. This resulted in the loss of stationary gripper coil current to the Control Rod Drive Mechanisms (CRDMs) for one of the three Shutdown Banks of control rods. Loss of stationary gripper coil current resulted in the insertion of the four associated control rods into the reactor core which led to the high power range negative flux rate trip.

Corrective actions included replacing the failed card with a spare and performing visual inspection and testing of additional cards in the Rod Control System Power Cabinets. These actions were completed prior to plant startup.

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

I. DESCRIPTION OF EVENT

On May 6, 2004, the plant was operating at 100% power. Prior to the event, there was a small primary-to-secondary leak of approximately nine gallons per day in the C steam generator with minimal activity in the secondary system. The preexisting primary-to-secondary leak did not contribute to the cause or impact of this event.

At 12:52 PM EDT the reactor automatically tripped from 100% power. The trip was due to a "Reactor Trip Power Range High Flux Rate" signal. This signal occurs when two of four power channels sense a negative flux rate. All rods fully inserted as designed, plant equipment functioned as required, and the operations staff responded to the event in accordance with applicable plant procedures. The plant was stabilized at normal operating no-load reactor coolant system (RCS) [AB] temperature and pressure following the reactor trip. Auxiliary feedwater (AFW) actuated twice and the Steam Generator Power Operated Relief Valves (PORVs) lifted momentarily during the plant transient while stabilizing conditions. Heat removal was accomplished via the condenser.

Post-trip analysis showed that there was a loss of stationary gripper coil current to the Control Rod Drive Mechanisms (CRDMs) [AA] for Shutdown Bank C. The Control Rod Drive System contains five Power Cabinets. Each cabinet is capable of controlling three banks of up to four control rods. The system is designed such that during at-power operation, a loss of power to a group of stationary gripper coils for shutdown rods will result in the insertion of those rods.

In addition to the repairs to correct the cause of the reactor trip, the primary-to-secondary leak in the C steam generator was repaired prior to plant restart.

Energy Industry Identification System (EIIIS) codes are identified in the text within brackets [].

II. CAUSE OF EVENT

The event was caused by a failed transistor on the stationary gripper regulation card [ECBD] in the Control Rod Drive Power cabinet [CAB] for Shutdown Bank C CRDMs. The root cause was a random failure of a transistor.

III. SAFETY SIGNIFICANCE

Actual Safety Consequences:

There were no safety significant consequences because of this event. Unplanned insertion of control rods and reactor trips are analyzed for the Harris Plant and are described in the HNP FSAR. A reactor trip is classified as an American Nuclear Society (ANS) Condition II event – a fault of moderate frequency

The plant is designed for a reactor trip, and it responded as expected for this condition. The initial plant conditions were within the bounding conditions for the plant design. The plant was stabilized at normal operating no-load RCS temperature and pressure following the reactor trip. Plant equipment functioned as required, and no unusual conditions were observed for plant equipment during this event. The operations crew responded to the event in accordance with plant procedures. No additional or compensatory measures were required for this event.

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

III. SAFETY SIGNIFICANCE (Continued)

Potential Safety Consequences

The potential safety consequences under alternate conditions are bounded by plant design. The most credible single failure assumption is the loss of one Nuclear Instrumentation System (NIS) channel [IG]. This results in a reduced ability for the NIS and Automatic Rod Control System to detect the core power redistribution characteristic of the event. In cases where a power range high neutron negative flux rate trip intercedes, the trip occurs when two of the three remaining channels reach the trip setpoint. In cases where the plant stabilizes at a new equilibrium condition without a reactor trip, no further protective action is required. The assumption that one NIS channel is lost has no impact on the RPS response. Therefore, consideration of other single failures within the protection system revealed no impact on the potential safety consequences of this event as well.

Given that the plant was operating within the design conditions at the time of the failure in the rod control system, there are no alternate scenarios that would result in significant adverse safety consequences.

IV. CORRECTIVE ACTIONS

The faulty stationary gripper card was replaced with a spare card, which restored proper stationary gripper coil currents in Power Cabinet SC.

Diagnostic tests were conducted along with visual inspections on the one hundred cards in the power cabinets as well as forty-five spare cards. Cards with diagnostic test problems or visual imperfections were repaired. No significant discrepancies were identified during the diagnostic activity. None of the additional cards tested exhibited component failures similar to the regulation card that caused the trip.

V. PREVIOUS SIMILAR EVENTS

No previous HNP events are known where a card failure in the rod control system resulted in a bank of control rods inserting into the core and a subsequent reactor trip. HNP LER 2003-003-00 described an event where a failure of a transistor on a printed circuit board (PCB) resulted in a main feedwater pump trip and subsequent reactor trip. The corrective action for that event was to modify the feedwater control system such that failure of the same PCB would not cause a main feedwater pump trip and subsequent reactor trip. The corrective action for the event described in the LER would not prevent this event because no actions were specified for the rod control system. Plant modifications to improve reliability are being prioritized to provide the greatest impact on reducing the frequency of unplanned scrams.

VI. COMMITMENTS

There are no commitments included in this report.