REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8707200448 DOC. DATE: 87/07/13 NOTARIZED: NO DOCKET #
FACIL: 50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
AUTH. NAME AUTHOR AFFILIATION
HUDSON, O. N. Carolina Power & Light Co.
WATSON, R. A. Carolina Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-035-00: on 870617, reactor coolant pump C tripped, resulting in reactor trip due to low flow in reactor coolant loop C. Caused by physical contact w/bus encl. Program to check & drain steam supply lines initiated. W/870713 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: Application for permit renewal filed. 05000400

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	PD2-1 LA	1	1	PD2-1 PD	1	1
	BUCKLEY, B	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	AEOD/DOA	1	1	AEOD/DSP/ROAB	2	2
	AEOD/DSP/TPAB	1	1	DEDRO	1	1
	NRR/DEST/ADE	1	0	NRR/DEST/ADS	1	0
	NRR/DEST/CEB	1	1	NRR/DEST/ELB	1	1
	NRR/DEST/ICSB	1	1	NRR/DEST/MEB	1	1
	NRR/DEST/MTB	1	1	NRR/DEST/PSB	1	1
	NRR/DEST/RSB	1	1	NRR/DEST/SGB	1	1
	NRR/DLPQ/HFB	1	1	NRR/DLPQ/QAB	1	1
	NRR/DOEA/EAB	1	1	NRR/DREP/RAB	1	1
	NRR/DREP/RPB	2	2	NRR/PMAS/ILRB	1	1
	NRR/PMAS/PTSB	1	1	REG FILE 02	1	1
	RES DEPY GI	1	1	RES TELFORD, J	1	1
	RES/DE/EIB	1	1	RGN2 FILE 01	1	1
EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
	LPDR	1	1	NRC PDR	1	1
	NSIC HARRIS, J	1	1	NSIC MAYS, G	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 44 ENCL 42

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Shearon Harris Nuclear Power Plant, Unit 1	0 5 0 0 0 4 0 0	1 OF 0 4

TITLE (4)

Reactor Trip - Reactor Coolant Low Flow due to Reactor Coolant Pump Trip

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
0 6	1 7	8 7	8 7	— 0 3 5 —	0 0	0 7	1 3	8 7		0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
1	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
1 0 0	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
O. N. Hudson, Senior Engineer - Regulatory Compliance	9 1 9 — 3 6 2 - 2 3 6 3

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

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

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

On June 17, 1987, the Shearon Harris Nuclear Power Plant was operating at 100% reactor power. At 0908, Reactor Coolant Pump "C" tripped which resulted in a reactor trip due to low flow in reactor coolant loop "C". Later investigation revealed that physical contact with the bus enclosure caused the trip of auxiliary bus 1C due to the actuation of the Phase "A" bus differential relay, which actuated the bus lockout relay and de-energized auxiliary bus 1C.

Plant shutdown response was normal except that the turbine-driven Auxiliary Feedwater (AFW) Pump started and then tripped on overspeed. The motor-driven AFW pumps started normally.

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

DESCRIPTION OF EVENT

On June 17, 1987, the Shearon Harris Nuclear Power Plant was operating at 100% reactor power. At 0908, Reactor Coolant Pump (RCP) 'C' tripped. This resulted in a reactor trip due to low flow in reactor coolant loop 'C'. Plant shutdown response was normal except that the turbine-driven Auxiliary Feedwater Pump (AFW) started and then tripped on electrical overspeed. The motor-driven AFW pumps started normally.

CAUSE

Immediate investigation of the trip showed that auxiliary Bus 1C tripped due to the actuation of the phase 'A' bus differential relay, which actuated the bus lockout (86) relay and de-energized auxiliary Bus 1C by opening circuit breaker 109. The result was the loss of RCP 'C' and a loop low flow trip. There were no other observable circuit breaker trip flags on the RCP circuit breaker or circuit breaker 109. Bus and RCP motor leads were checked for grounding and no deficiencies were noted. The phase A differential relay was taken to the shop for testing and found to be in calibration and proper operating condition. Inspection of RCP 'C' and components in containment did not reveal any problems.

The investigation uncovered no equipment failures; thus, events which could have caused spurious actuation of the relays were investigated next. The investigators searched for and contacted personnel who had been in that area around 0900. It was determined that at about the time of the trip, a work crew of three individuals and a security officer were maneuvering a cart in front of the bus enclosure. The workers involved were construction personnel completing penetration seals. The cart was loaded with several pails of heavy penetration insulating material. The work crew had to maneuver the cart through a door and over a six-inch high drainage curb on the floor adjacent to the bus enclosure. The barrier is removable, but it is bolted to the floor and heavily caulked.

While moving the cart over the barrier, the cart steering handle and one of the workers must have been within a few inches of the bus enclosure. The workers did not recall any contact with the bus enclosure; however, interviews with the workers verified the fact that the plant trip occurred just after the cart front wheels passed over the barrier. The workers stated that they had heard some noise as they were moving the cart. The workers, however, were not familiar with the plant and plant operation; they did not understand that the noise they heard was actuation of relays which resulted in the plant trip.

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

CAUSE (continued)

Upon examination, the investigators noticed a small fresh "ding" on the enclosure near the phase differential relay, and they collected a few paint chips. Since it appeared that the bus enclosure may have been bumped, the investigators tested and verified that a moderate blow to the auxiliary Bus 1C enclosure in the vicinity of the phase differential relay would cause one of the relays to actuate. Contact with other utilities indicates that at least one other plant site has experienced impact sensitivity with the same model relay.

As a result of: (1) the workers moving the heavy load in the immediate vicinity of the bus enclosure, (2) the workers having heard the plant trip as they were moving the load, (3) the fresh "ding" on the enclosure, and (4) verification that contact with the bus enclosure could trip the relay, it was concluded that one of the workers or the cart inadvertently contacted the auxiliary bus enclosure and caused the trip.

At the time of this event, the turbine-driven AFW pump was not declared operable pending the closeout of an AFW check valve modification on the AFW line to the Steam Generator. The affected line was in the process of being returned to service and the pump should have responded properly to the start signal. The steam supply line had been drained by the plant Operators earlier in the shift. After the trip, the lines were drained again and considerable moisture was found. After draining the lines, the AFW pump was successfully started three times and test started under full flow conditions. It was determined that the water accumulation in the steam supply lines was the probable cause of the turbine overspeed. The steam supply line is normally depressurized but accumulates moisture due to leakage past the isolation valves. Prior to this event, the moisture was being manually drained approximately every four hours. A plant modification (PCR-1235) to install drain traps was pending installation. After the event, an escalated program was initiated to check and drain the steam supply lines.

ANALYSIS

This event is reportable in accordance with 10CFR 50.73(a)(2)(iv) due to the automatic reactor trip and the actuation of the reactor protection system, and the Auxiliary Feedwater System.

The loss of flow from a single RCS loop is an event analyzed in the FSAR. An automatic trip is required to protect the fuel from damage by maintaining DNBR greater than 1.30. Since the reactor trip was successfully initiated by the loop flow indicators, no adverse consequences occurred. There was no impact on plant safety as a result of this event. All systems, with the exception of the turbine-driven AFW Pump, functioned as required by design.

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

CORRECTIVE ACTIONS

The following corrective actions to prevent recurrence of this event have been taken or are planned:

1. A program has been initiated to check and drain the steam supply lines as necessary. At least until PCR-1235 is installed (Item 2 below), the lines will be checked approximately once per hour. If the lines drain more than 2-3 minutes, the frequency will be increased. Any reduction in frequency must be documented and approved by plant management.

2. Complete plant modification PCR-1235 to install drain traps on the steam supply lines to the turbine-driven AFW pump.

3. Identify locations of similar relays throughout the plant, and paint the floor area around them to heighten personnel awareness when they are in these locations.

CP&L
Carolina Power & Light Company

HARRIS NUCLEAR PROJECT
P.O. Box 165
New Hill, NC 27562

JUL 13 1987

File Number: SHF/10-13510C
Letter Number: HO-870462 (O)

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

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 87-035-00

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-1022, September, 1983.

Very truly yours,

R A Watson

R. A. Watson
Vice President
Harris Nuclear Project

RAW:skm

Enclosure

cc: Dr. J. Nelson Grace (NRC - RII)
Mr. B. Buckley (NRR)
Mr. G. Maxwell (NRC - SHNPP)

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