



Carolina Power & Light Company
Harris Nuclear Plant
PO Box 165
New Hill NC 27562

JUL 20 2000

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

Serial: HNP-00-115
10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2000-005-00

Sir or Madam:

In accordance with 10CFR50.73, the enclosed Licensee Event Report is submitted. This report describes a reactor trip and an auxiliary feedwater actuation caused by an inadvertent closure of a main feedwater isolation valve.

Sincerely,

R. J. Duncan II
General Manager
Harris Plant

MSE/mse

Enclosure

c: Mr. J. B. Brady (HNP Senior NRC Resident)
Mr. R. J. Laufer (NRC-NRR Project Manager)
Mr. L. A. Reyes (NRC Regional Administrator, Region II)

IF22

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

FACILITY NAME (1) Harris Nuclear Plant, Unit 1	DOCKET NUMBER (2) 05000400	PAGE (3) 1 OF 3
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TITLE (4)
Manual Reactor Trip due to a reduction in Feedwater Flow

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 NAME	DOCKET NUMBER
06	20	2000	2000	- 005	-- 00	07	20	2000	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more) (11)									
POWER LEVEL (10) 100	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)			
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)			
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71			
	20.2203(a)(2)(ii)		20.2203(a)(4)		x 50.73(a)(2)(iv)		OTHER			
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below			
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		or in NRC Form 366A			

LICENSEE CONTACT FOR THIS LER (12)

NAME Mark Ellington, Project Analyst - Licensing	TELEPHONE NUMBER (Include Area Code) (919) 362-2057
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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
B	SJ	SOL	AUTOMATIC VALVE CO	y					

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

On June 20, 2000 at 1631 hours with Harris Nuclear Plant (HNP) at 100% power, control room operators initiated a manual reactor trip in response to lowering level in the "A" Steam Generator (SG). The cause of the lowering level in "A" SG was due to the unexpected closure of the "A" Main Feedwater Isolation Valve (MFIV). The low water level in "A" SG resulted in an automatic actuation of both motor-driven auxiliary feedwater pumps. The control room operators restored "A" SG water level following the reactor trip. There were no other structures, systems, or components that were inoperable at the start of the event and that contributed to the event.

Cause of this event:

A random manufacturing defect of a diode in a solenoid valve for the "A" MFIV actuator.

Corrective actions include:

The defective solenoid valve for the "A" MFIV was replaced.

NRC FORM 366A
(6-98)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER) **TEXT CONTINUATION**

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Harris Nuclear Plant, Unit 1	05000400	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		2000	-- 005	-- 00	

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

I. DESCRIPTION OF EVENT

On June 20, 2000 at 1631 hours with Harris Nuclear Plant (HNP) at 100% power, control room operators initiated a manual reactor trip in response to lowering level in the "A" Steam Generator (SG). The cause of the lowering level in "A" SG was due to the unexpected closure of the "A" Main Feedwater Isolation Valve (MFIV). The low water level in "A" SG resulted in an automatic actuation of both motor-driven auxiliary feedwater pumps. The control room operators restored "A" SG water level following the reactor trip. There were no other structures, systems, or components that were inoperable at the start of the event and that contributed to the event.

The Feedwater Isolation Valves (FWIV) are operated by an actuator that uses nitrogen gas pressure as the fluid medium. A solenoid valve arrangement is employed in the control circuit to port nitrogen off the actuator cylinder for the closing sequence. The solenoid is normally energized and closed when the FWIV is full open. The solenoid de-energizes and opens to port the nitrogen off the actuator cylinder and allows the FWIV to close. The solenoid valves are arranged in two redundant trains with 2 solenoid valves in each train. A single fused power supply is provided from auxiliary relay panels ARP-1A(SA) and ARP-1B(SB). The valve actuators were modified in HNP refueling outage 9 (R09) to improve reliability. The previous design did not have redundant solenoids in the control circuit. The plant had operated at power with the FWIVs in service for 38 days prior to the failure of the diode. The failure of the "A" MFIV was due to a shorted diode in a solenoid (EIIS: SJ-SOL) that resulted in a blown fuse in the solenoid power circuitry de-energizing the solenoid causing the "A" MFIV to go shut.

During normal power operation, the feed and condensate systems operate automatically in response to normal system transients and design accidents. The system operates with two parallel trains; each train consists of a condensate pump, condensate booster pump, heater drain pumps, four low pressure feedwater heaters, feed pump, and one high pressure heater. The combined discharge of the two feed pumps feed a common header which serves the three feedwater control valves which control total feed flow to each steam generator. Downstream of each control valve is a restricting orifice which forces a portion of the total feed flow into the auxiliary feed nozzle. At full power the feed split will be approximately 82% to the preheater of the SG and approximately 18% to the auxiliary feedwater nozzle. This prevents flow induced vibration of the tubes in the preheater section of the steam generator. The closure of the "A" MFIV did not result in a total loss of feedwater flow to "A" SG due to the parallel path through the auxiliary feed nozzle. The feedwater flow through the auxiliary feed nozzle was not sufficient to maintain SG level and a reactor trip was required when the "A" MFIV closed.

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TEXT CONTINUATION

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

II. CAUSE OF EVENT

A random manufacturing defect of a diode in a solenoid valve for the "A" MFIV actuator.

III. SAFETY SIGNIFICANCE

There were no releases of radioactive material and no challenges to fission product barriers as a result of this event.

This condition represents a reactor trip initiated by a reduction in feedwater flow. Reactor trips result in an increase in the PRA initiating event factor which has an effect on the calculated core damage frequency. The increase in core damage frequency is minimal, less than 1.5%, because the PRA does not model flow through the FWIV for any mitigating strategy. The assumed flow path is through the pre-heater bypass line to the auxiliary feed nozzle. This path is unaffected by this event.

This report is being submitted pursuant to the criteria of 10CFR50.73(a)(2)(iv) for any event or condition that resulted in a manual or automatic actuation of any engineered safety feature including the reactor protection system.

IV. CORRECTIVE ACTIONS

The defective solenoid valve for the "A" MFIV was replaced.

V. SIMILAR EVENTS

There have been no previous reportable events at HNP where a MFIV has failed as a result of random solenoid failure.