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ACCESSION NBR: 9512110464 DOC. DATE: 95/12/03 NOTARIZED: NO DOCKET #
 FACIL: 50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
 AUTH. NAME AUTHOR AFFILIATION
 VERRILLI, M. Carolina Power & Light Co.
 DONAHUE, J.W. Carolina Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-011-01: on 951105-06, reactor trip/SI signal generated & unplanned ESF actuation occurred during troubleshooting. Reactor trip caused by equipment failure. Component replaced. W/951205 ltr.

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NOTES: Application for permit renewal filed. 05000400

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

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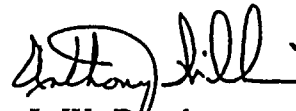
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10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 95-011-00

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report concerns an unplanned Reactor Trip/Safety Injection event and an ESF Actuation during subsequent testing.

Sincerely,

 for JWD

J. W. Donahue
General Manager
Harris Plant

MV

Enclosure

c: Mr. S. D. Ebnetter (NRC - RII)
Mr. N. B. Le (NRC - PM/NRR)
Mr. D. J. Roberts (NRC - HNP)

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S PDR



U. S. Nuclear Regulatory Commission
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Page 2

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NRC FORM 366 (4-95)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 500 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.</small>
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)		

FACILITY NAME (1) Shearon Harris Nuclear Plant - Unit # 1	DOCKET NUMBER (2) 50-400	PAGE (3) 1 OF 3
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TITLE (4)
 Reactor Trip/Safety Injection during Solid State Protection System testing due to the failure of a relay contact, and unplanned ESF actuation during troubleshooting following the Reactor Trip/SI.

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
11	05	95	95	-- 011	-- 00	12	03	95	FACILITY NAME	DOCKET NUMBER

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)(ii)			50.73(a)(2)(ii)			50.73(a)(2)(x)	
	20.2203(a)(2)(i)			20.2203(a)(3)(iii)			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 or in NRC Form 366A	
20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)	
NAME Michael Verrilli, Sr. Analyst - Licensing	TELEPHONE NUMBER (Include Area Code) (919) 362-2303

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
B	JE	RLY CNTR	P297	Y						

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

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

On November 5, 1995, A-Train Engineered Safety Feature Actuation System (ESFAS) slave relay surveillance testing was in progress. While performing the test portion that verifies the operability of the Main Steam Line Isolation Signal circuitry, a "Low Steam Line Pressure Reactor Trip/SI" signal was generated. This occurred when a contact failed to maintain continuity on the K809 relay and eliminated the "block" function to the "A" Main Steam Isolation Valve (MSIV), which resulted in the "A" MSIV closing. As the valve closed and turbine throttle valve position remained constant, increased steam load was carried by "B" and "C" Steam Generators (SGs). This resulted in a pressure decrease in the "B" and "C" main steam lines due to increased steam flow. The rate compensation feature associated with the low steam line pressure SI initiated a low steam line pressure Reactor Trip/SI Signal for "C" steam line. Automatic systems responded as required and main control room operators took appropriate actions to stabilize the plant in Mode-3 (Hot Standby). An Unusual Event was declared at 0805 due to the ECCS actuation. The UE was then exited at 0912 based on the termination of SI.

On November 6, 1995, continued ESFAS slave relay testing was being performed following the Reactor Trip/SI event from the previous day. During this testing the Auxiliary Feedwater (AFW) Flow Control Valves fully opened from their original throttled position. While this valve actuation was in accordance with system design, it was not recognized in the procedure. Thus, operators performing the test did not expect the valve operation. The test being performed is normally performed in Mode-1 with the AFW FCV's fully open. With the plant in Mode-3, the valves are throttled to control Steam Generator (SG) level. The operators recognized that the valves were opening and reestablished Steam Generator level control prior to exceeding the normal operating band. During the investigation of this actuation, a similar occurrence was identified where the AFW FCV's partially opened during testing on October 30, 1994. At that time the actuation was not recognized as reportable, but should have been.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1) Shearon Harris Nuclear Plant - Unit #1	DOCKET 50-400	LER NUMBER (6)			PAGE (3) 2 OF 3
		YEAR 95	SEQUENTIAL NUMBER 011	REVISION NUMBER 00	

TEXT (If more space is required, use additional copies of NRC Form 388A) (17)

EVENT DESCRIPTION:

On November 5, 1995, with the plant operating in Mode-1 at 100% power, A-Train Engineered Safety Feature Actuation System (ESFAS, EIIS Code: JE) slave relay surveillance testing (OST-1044) was in progress. While performing section 7.3 of the test procedure, the portion of the test that verifies the operability of the Main Steam Line Isolation Signal circuitry, a "Low Steam Line Pressure Reactor Trip/Safety Injection (SI)" signal was generated. This occurred at 0737 hours, when a contact failed to maintain continuity on the K809 relay and eliminated the "block" function to the "A" Main Steam Isolation Valve (MSIV, EIIS Code: SB), which resulted in the "A" MSIV closing. As the valve closed and turbine throttle valve position remained constant, steam load was carried by "B" and "C" Steam Generators (S/Gs). This resulted in a pressure decrease in the "B" and "C" main steam lines due to increased steam flow. The rate compensation feature associated with the low steam line pressure SI initiated a low steam line pressure Reactor Trip/SI Signal for "C" steam line. Automatic safety equipment functioned as required except for the "closed" indication on one valve, SP-941, (Hydrogen Monitor isolation valve, EIIS Code: TK). It was later determined that the valve closed as required but experienced a position indication proximity switch problem.

Due to the SI, the Reactor Coolant System (RCS, EIIS Code: AB) was being filled to solid plant conditions by the injection flow. The main control room operators proceeded through the Emergency Operating Procedure (EOP) network as required to secure SI. Although progress through the EOP procedure flow paths was timely, it did not prevent the plant from going solid. The solid plant conditions resulted in an increase in RCS pressure, which lifted a pressurizer PORV. A liquid/steam mixture was released by the pressurizer PORV to the Pressurizer Relief Tank (PRT). During this time the PORV actually cycled approximately 58 times. This resulted in an overpressure condition in the PRT and one of the two rupture disks ruptured as required to limit pressure in the tank. Approximately 1200 gallons of water from the PRT spilled over into the containment sump through the rupture disk. The control room staff took actions necessary to stabilize the plant and establish operation in Mode-3 (Hot Standby). An Unusual Event (UE) was declared at 0805 due to the ECCS actuation. The UE was then exited at 0912 based on termination of SI and stabilization of the plant in Mode-3. Operations personnel performing the test at the time of the Reactor Trip/SI signal took prompt and appropriate actions to preserve existing plant and system conditions, which were critical in identifying the deficient K809 relay contacts.

On November 6, 1995, continued ESFAS Slave Relay testing was being performed following the Reactor Trip/SI event from the previous day to verify the operability of other SSPS "block function" relays. At 1509 hours, while performing section 7.3 of the A-Train, K635 Relay SI Block Circuit Test (OST-1044), the Auxiliary Feedwater (AFW, EIIS Code: BA) Flow Control Valves (FCV's) fully opened from their original throttled position. While this valve actuation was in accordance with system design, it was not recognized in the procedure. Thus, operators performing the test did not expect the valve motion. Based on the guidance of NUREG-1022, the opening of the AFW FCV's was considered an unplanned ESF actuation. OST-1044 is a quarterly interval surveillance test that is normally performed in Mode-1 with the AFW FCV's fully open. Due to the fact that these valves have been open during previous testing, no valve motion occurred. With the plant in Mode-3 following the Reactor Trip/SI, the valves were throttled to control Steam Generator (SG) level. The operators recognized that the valves were opening and reestablished Steam Generator level control prior to exceeding the normal operating band. During the investigation of this actuation, a similar occurrence was identified where the AFW FCV's partially opened during testing on October 30, 1994. At that time the actuation was not recognized as reportable, but should have been. Corrective actions for this occurrence involved a revision to the K640 Relay "Go Circuit" portion of the test procedure, but the "block circuit" portion of the test was not recognized, nor revised as needed.

CAUSE:

The cause of the Reactor Trip/SI was component/equipment failure. One set of contacts on the K809 "blocking" relay failed to maintain continuity as required when the block signal was generated. Additional analysis will be performed to determine the cause and failure mode of the relay contacts. The Unplanned ESF Actuation was caused by an inadequate procedure. Section 7.3 of OST-1044 did not provide proper guidance to ensure that operators performing the test were aware that the AFW Flow Control Valves would receive an open signal while testing the K635 block circuit. The October 30, 1994 AFW FCV actuation was also caused by a deficient procedure and was not reported due to a misunderstanding of reporting requirements on the part of Operations personnel that were involved with testing at the time.



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

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Shearon Harris Nuclear Plant - Unit #1	05000400	95	011	00	3 OF 3

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

SAFETY SIGNIFICANCE:

There were no significant safety consequences as a result of either event. The reactor trip and safety injection actuations were initiated by plant conditions resulting from an equipment failure. Safety systems responded as required to ensure plant safety and operators appropriately responded to verify system response and stabilize the plant in Mode-3. The Unplanned ESF Actuation was also a result of plant systems responding as designed. Though the opening of the AFW Flow Control Valves was unexpected by operators performing the testing, S/G level was never outside of the normal operating band.

PREVIOUS SIMILAR LERs:

No similar LERs have been reported.

CORRECTIVE ACTIONS COMPLETED:

1. The K809 Block Relay was replaced and A-Train ESFAS Slave Relay Testing was completed.
2. An engineering analysis, including a walkdown inspection was completed for the secondary plant to evaluate possible water hammer effects.
3. An inspection was performed in the containment building for the areas in the vicinity of the PRT that contain environmentally qualified equipment.
4. An inspection was performed to assess the condition of the PRT Rupture disks. This included a "foreign material exclusion" inspection for rupture disk fragments.
5. An evaluation was performed to assess the effects of the water (approximately 1,200 gallons) that spilled into the containment sump from the PRT rupture disk.
6. An inspection and evaluation was performed to assess the condition of the Pressurizer PORV that lifted and cycled during the event.

For each of the above inspections and/or evaluations (C/A's 2-6) no discrepancies were identified that would adversely effect or preclude plant startup.

CORRECTIVE ACTIONS PLANNED:

1. Additional investigation into the cause and failure mode will be performed for the K809 relay contacts that failed during testing.
2. Surveillance procedures OST-1044 and OST-1045 will be revised to provide operators guidance pertaining to the operation of AFW Flow Control Valves during K635 Relay testing.
3. Reporting requirements related to unplanned ESF actuations will be reemphasized with Operations personnel.
4. Additional review will be completed to ensure that similar AFW System testing deficiencies do not exist in other procedures.

EIIS CODES:

Engineered Safety Feature Actuation System, EIIS System Code: JE Component Code: RLY CNTR
 Main Steam System, EIIS System Code: SB Component Code: ISV
 Hydrogen Monitor Isolation Valve, EIIS System Code: TK Component Code: ISV
 Reactor Coolant System, EIIS System Code: AB
 Auxiliary Feedwater System, EIIS System Code: BA Component Code: FCV

