Progress Energy

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

Serial: HNP-03-087
10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2003-004-00

Ladies and Gentlemen:

The enclosed Licensee Event Report 2003-004-00 is submitted in accordance with 10 CFR 50.73. This report describes an auxiliary feedwater actuation following closure of the reactor trip breakers. Event notification EN# 39939 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,

B. C. Waldrep
Plant General Manager
Harris Nuclear Plant

BCW/jpy

Enclosure

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

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Progress Energy Carolinas, Inc.
Harris Nuclear Plant
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NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Harris Nuclear Plant – Unit 1	05000400	1 OF 4

4. TITLE
Auxiliary Feedwater Actuation Following Closure of the Reactor Trip Breakers

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
06	15	2003	2003	- 004 -	00	08	12	2003	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	3
10. POWER LEVEL	0

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

	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	TELEPHONE NUMBER (Include Area Code)
John Yadusky – Lead Licensing Engineer	(919) 362-2020

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

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

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

On June 15, 2003 at 0928 with the reactor shutdown in Mode 3, an automatic actuation of the auxiliary feedwater (AFW) system occurred following closure of the reactor trip breakers (RTBs) in preparation for a reactor startup. Due to an inappropriate equipment configuration, closing the reactor trip breakers resulted in two of the Main Feedwater Regulating Valves (MFRVs) opening to their full-open position. Water levels in two steam generators increased and exceeded the high-high level setpoint (78%). This condition resulted in a trip of the "A" main feedwater pump, which initiated an auto-actuation of both motor-driven auxiliary feedwater (MDAFW) pumps.

The root causes of the event are substandard performance of license duties by both individuals and the control room team. Corrective actions for these events cover a broad spectrum of plant programs and personnel management including training, procedures, and personnel assignment. Immediate corrective action verified that plant components were properly aligned to support plant start-up and adjustment of the control room crew assignments. Additional corrective actions include revising the procedure to verify proper alignment of the MFRVs prior to closure of the RTBs (complete) and enhancing operator training.

1. FACILITY NAME	2. DOCKET NUMBER (2)	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2003	- 004 -	00	2 OF 4

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

I. DESCRIPTION OF EVENT

On June 15, 2003 at 0928 with the reactor shutdown in Mode 3, an auto-actuation of the auxiliary feedwater (AFW) system [BA] occurred following closure of the reactor trip breakers (RTBs) [BKR] in preparation for a reactor startup.

At the time of this event, the reactor coolant system (RCS) [AB] temperature and pressure were at no-load conditions. Steam generator (SG) level was being controlled by the main feedwater regulating bypass valves (MFRBVs) level control system [JB]. The main feedwater regulating valves (MFRVs) [SJ-LCV] were aligned in "AUTO" and the MFRV block valves were open. The "A" and "C" SGs were slightly below their programmed level of 57%, and the "B" SG was slightly above 57%. The reactor trip breakers (RTBs) were open due to a manual reactor trip on June 14, the day before this event. With the RTBs open and reactor coolant temperature less than 564°F, a permissive (P-4) block signal maintains the MFRVs closed.

Closing the RTBs removed the permissive (P-4) block signal that was maintaining the MFRVs closed and resulted in two of the MFRVs opening automatically to their fully-open demand position. With two of the MFRVs fully open and no-load conditions on the secondary side of the plant, water levels in two steam generators increased and exceeded the high-high level trip setpoint (78%) in less than one minute. This condition generated a main feedwater isolation signal, which automatically tripped the single operating main feedwater pump (MFP) [SJ-P]. The trip of the "A" MFP subsequently initiated an auto-actuation of both motor-driven auxiliary feedwater (MDAFW) pumps, which is reportable per 10 CFR 50.73(a)(2)(iv)(A) as an unplanned AFW actuation.

Since the additional feedwater flow was not required and to mitigate cooldown, operators promptly secured AFW. During this event, the maximum steam generator level increased to approximately 82%. Due to the RCS cooldown, the pressurizer level decreased. In response, RCS letdown automatically isolated and pressurizer heaters [AB-EHTR] automatically secured as designed. The reactor vessel [RPV] remained full of water. The plant responded as expected, no plant design limits were exceeded, and no additional or compensatory measures were required for this event. After this event, plant conditions were promptly stabilized, and the reactor coolant system (RCS) temperature and pressure returned to normal no-load conditions within an hour.

Following the reactor trip on June 14 and in preparation for reactor startup, the procedure that was used to realign the MFRVs referenced another procedure to transfer SG level control to the MFRBVs. However, the required steps to be completed in the referenced procedure were not specified. Without referencing the required steps, the operator realigning the MFRVs did not recognize that the referenced procedure had additional actions to: 1) place the MFRVs controllers in Manual (MAN), 2) set the demand output of the MFRVs to zero percent, and 3) shut the MFRV block valves. The operator signed off the step as completed in the first procedure without putting the MFRVs in "MAN" and completing the two additional required actions within the referenced procedure.

Other control room staff recognized that the MFRVs were still in "AUTO" rather than in "MAN," but they assumed that procedures would place the MFRV controllers in the correct alignment at a later point in the startup sequence. The operators should have validated the status of the procedure or should have documented that the valves were not in the expected position. When preparing to close the RTBs, the operator failed to recognize that closing the breakers would remove the P-4 block [BLK] and cause the subsequent response of the MFRVs.

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

1. FACILITY NAME	2. DOCKET NUMBER (2)	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2003	- 004 --	00	3 OF 4

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

II. CAUSE OF EVENT AND CORRECTIVE ACTIONS

The root causes of the event are substandard performance of license duties by both individuals and the control room team. Corrective actions for these events cover a broad spectrum of plant programs and personnel management including training, procedures, and personnel assignment. Immediate corrective action verified that plant components were properly aligned to support plant start-up and adjustment of the control room crew assignments. Additional corrective actions include revising the procedure to verify proper alignment of the MFRVs prior to closure of the RTBs (complete) and enhancing operator training.

Summary of the inappropriate acts:

- A procedural step was signed as complete without completing all the applicable referenced actions.
- Operations recognized that the MFRVs were in AUTO and failed to place them in MAN.
- Operators did not communicate important information to the unit senior control operator.
- Operators closed the reactor trip breakers with unit senior control operator concurrence with an inappropriate configuration of the main feedwater regulating valves.

Summary of causes:

- Lack of teamwork and command in control
- Substandard performance of duties by individuals and the control room team
- The procedure step lacked specificity in branching to another procedure
- Failure to document the status of procedure before leaving shift, and
- Failure to recognize that closing the RTBs would remove a permissive that was keeping the MFRVs shut

Summary of corrective actions:

- Verified that the components were properly aligned to support the plant startup (complete)
- Evaluate and Adjust crew composition (complete, and then on an annual basis)
- Revise procedures to provide clarity and specificity regarding MFRV positioning (complete)
- The Manager of Shift Operations met with each shift and discussed configuration control, pursuing identified open items, communications, and shift-turnover of off-normal component configurations to emphasize management expectations. (complete)
- Develop and implement real time training on the event and on control interlocks and permissives.

III. SAFETY SIGNIFICANCE

There were no safety significant consequences as a result of this event. The reactor was shutdown, and the reactor coolant system (RCS) temperature and pressure were at no-load conditions. This event resulted in an increase in feedwater flow, which is an anticipated operational occurrence that is analyzed for the Harris Nuclear Plant (HNP). This event is classified as an ANS Condition II event – a fault of moderate frequency.

1. FACILITY NAME	2. DOCKET NUMBER (2)	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2003	- 004 -	00	4 OF 4

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

III. SAFETY SIGNIFICANCE (Continued)

The increase in feedwater flow resulted in a maximum SG level of 82%. The plant is designed for an increase in feedwater flow and responded as expected for this condition. The operations crew responded to the event in accordance with plant procedures. No additional or compensatory measures were required for this event.

No significant safety consequences exist under reasonably expected alternate conditions that would place the plant in a condition beyond its design bases.

IV. PREVIOUS SIMILAR EVENTS

No previous HNP events or conditions are known related to an improperly aligned MFRV that caused an engineered safety feature (ESF) actuation. One previous condition is known related to lack of control room teamwork, and command and control.

HNP LER 95-010-00 (reported 11/13/95)

At 5% power, a turbine trip - reactor trip occurred during turbine mechanical overspeed testing when an operator mistakenly placed the turbine overspeed protection controller (OPC) switch in the OPC TEST position versus the OVERSPEED TEST PERMISSIVE position. The OPC functioned as designed, causing the turbine governor and intercept valves to begin closing thus reducing turbine speed. After a brief discussion among the control room staff, the senior control operator directed the operator to return the switch to its original position. When the OPC switch was returned to the IN SERVICE position, the turbine control system functioned as designed and immediately attempted to return the turbine from approximately 1690 rpm to 1800 rpm, causing a sudden increase in steam flow to the turbine. This increase in steam flow caused steam generator (SG) levels to increase, subsequently generating a SG high-high level signal on the "B" SG. This signal resulted in a turbine trip, reactor trip, and main feedwater isolation. The trip of the "B" main feedwater pump generated an auxiliary feedwater (AFW) start signal to both motor-driven AFW pumps.

The cause of the condition was attributed to a lack of operator knowledge on the turbine control panel, and insufficient control room command and control, teamwork, and communications.

Corrective actions included operator counseling, installation of clearer OPC switch markings, refresher teamwork training for the operators, and re-enforcing the use of human error reduction techniques during simulator training. Since these corrective actions were implemented, no turbine trip - reactor trip has occurred due to mispositioning of the OPC switch.

The previous condition involved an inappropriate recovery during a plant transient caused by a mispositioned OPC switch. With the turbine reducing speed, the control room staff was faced with making time-critical decisions. The current event involved misaligned MFRVs for a significantly longer period of time (approximately one day) with two different control room shifts. Although the previous condition and the current event involve the same root cause (teamwork and command and control), due to the differences in time, processes, personnel, and circumstances, no significant pattern in recurring events has been identified. Therefore, the previous corrective actions would not have prevented the current event.