



FEB 15 2006

Serial: HNP-06-030  
10CFR50.73

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 2006-001-00

Ladies and Gentlemen:

The enclosed Licensee Event Report 2006-001-00 is submitted in accordance with 10 CFR 50.73. This report describes a condition prohibited by Technical Specifications (TS) in that Turbine Generator Electro-Hydraulic Control Low Fluid Pressure switches in both trains were not operable due to a common cause.

This document contains no new Regulatory Commitment.

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

Sincerely,

A handwritten signature in cursive script that reads "Eric McCartney".

Eric McCartney  
Plant General Manager  
Harris Nuclear Plant

EAM/khv

Enclosure

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

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

IE22

**LICENSEE EVENT REPORT (LER)**

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

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

<b>1. FACILITY NAME</b> Harris Nuclear Plant - Unit 1	<b>2. DOCKET NUMBER</b> 05000400	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Multiple Turbine EHC Low Fluid Pressure Switches Inoperable due to a Common Cause

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	19	2005	2006	- 001 -	00	2	15	2006	N/A	05000
									N/A	05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> (Check all that apply)									
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A						

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME Kelli Voelsing – Licensing Specialist	TELEPHONE NUMBER (Include Area Code) 919-362-3057
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	TG	PS	UE Controls	N					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>
		MONTH DAY YEAR

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

On December 19, 2005, with the reactor at approximately 100% power, the Turbine Generator Electro-Hydraulic Control (EHC) Low Fluid Pressure Switches [TG] were calibrated and four of six pressure switches were found outside their Technical Specification (TS) allowable limit of greater than or equal to 950 psig. All switches were recalibrated and left in an operable condition at the time of discovery. Upon review, it was determined that these four switches would have resulted in 2 of 3 channels on each protective train not being operable by TS. The switches were functional at all times and are not credited in the accident analysis.

The Root Cause of this event was that the original instrument uncertainty calculation did not allow sufficient margin between the trip setpoint and allowable value due to a change in switch characteristics subsequent to the calculation development. The vendor changed the repeatability specification for the current model from 1.5% to 3.0% which was not reflected in the uncertainty calculation and/or margin allowed for these pressure switches.

The corrective action to prevent recurrence was to develop and implement an Engineering Change to account for the vendor's increased repeatability specification from 1.5% to 3.0% and provide increased margin to the TS Limit of greater than or equal to 950 psig. This change was implemented on January 9, 2006.

## LICENSEE EVENT REPORT (LER)

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

## I. DESCRIPTION OF EVENT

On December 19, 2005, with the reactor at approximately 100% power, the Turbine Generator Electro-Hydraulic Control (EHC) Low Fluid Pressure Switches [TG] were calibrated and four of six pressure switches were found outside their Technical Specification (TS) allowable limit of greater than or equal to 950 psig. All switches were recalibrated and left in an operable condition at the time of discovery. Upon review, it was determined that these four switches would have resulted in 2 of 3 channels on each protective train not being operable by TS. The fact that four of six switches were found outside of their TS limits is an indication that the condition arose over a period of time and existed prior to the surveillance test. The inoperable condition had been rectified by the switch calibration prior to discovery that the equipment had been inoperable.

Although the switches were inoperable by TS, they were functional at all times. In the event of a turbine trip, EHC fluid pressure drops rapidly from 2000 psig to 0 psig. The pressure switch setpoints for the four switches found outside their TS allowable value ranged from 790 to 930 psig. The switches would have provided the desired trip signal to the Reactor Protection System (RPS) [JC] although at a pressure lower than the 950 psig TS lower limit. Since the EHC pressure drops rapidly, there would have been minimal time delay associated with the functioning of this switch at a pressure slightly lower than 950 psig. These pressure switches are not credited in the accident analysis for Harris Nuclear Plant (HNP).

The switches are United Electric (UE) Controls Type J402 Model 612, multi-contact pressure switches locally mounted to the Turbine EHC fluid system. The switches monitor the Turbine Stop Emergency Trip fluid pressure and provide contact "change of state" input signals to the RPS logic to initiate a Low Fluid Oil Pressure trip when two of three pressure switches indicate pressure is  $\leq 1000$  psig. There are a total of three switches each with contact inputs to RPS trip logic A and RPS trip logic B. Two of three switches below setpoint is indicative of a turbine trip and causes a reactor trip if reactor power is above 10%. The trip function is automatically blocked below 10% reactor power. These switches are Quality Class "E", Non-Safety Related, Non-Seismic devices. FSAR section 15.2.3.2 and Design Basis Documents (DBDs) document that these switches are not credited to operate under accident conditions.

An instrument uncertainty calculation (HNP-I/INST-1055) for these pressure switches was developed in 1997. The calculation used a statistical analysis of as found data for the uncertainties of the switch. A key part of this calculation used a "repeatability" factor of  $\pm 1.5\%$  of instrument span. This was based upon the vendor data at that time for the Series 300 United Electric Control switches and remained unchanged for the 400 Series when the 300 Series became obsolete. However, recent data from the vendor specifies a  $\pm 3.0\%$  repeatability for the Series 400 switch models. The vendor changed the specification based on field experience and in-house testing with this model of pressure switch. The vendor was unable to locate the date of the next printing of the product literature after the internal 1997 "Sales Alert," and this information was not provided to HNP in response to routine letters to vendors requesting "the latest installation, calibration, operation, and maintenance information available for our equipment."

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

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

**II. CAUSE OF EVENT**

The Root Cause of this event was that the original instrument uncertainty calculation did not allow sufficient margin between the trip setpoint and allowable value due to a change in specifications subsequent to the time of the calculation development. The vendor changed the repeatability specification for the current model from 1.5% to 3.0% which was not reflected in the uncertainty calculation and/or margin allowed for these pressure switches.

**III. SAFETY SIGNIFICANCE**

Though the Turbine Generator (EHC) Low Fluid Pressure Switches were not operable by TS, they retained their function of providing indication of turbine trip to the SSPS. On a turbine trip, EHC fluid pressure will drop rapidly from approximately 2000 psig to 0 psig. Despite the fact that the TS limits were exceeded, the switches would have still functioned to initiate an anticipatory reactor trip on a turbine trip, although at a pressure lower than the TS limit of greater than or equal to 950 psig. This function is redundantly accomplished by the sensing of turbine throttle valve shut limit switches.

In addition to maintaining their functionality, the direct reactor trip on turbine trip function of the turbine stop emergency trip fluid pressure switches is not credited in the accident analysis in FSAR Chapter 15.

This condition is reportable as a condition prohibited by Technical Specifications pursuant to 10 CFR 50.73(a)(2)(i)(B) and as common-cause inoperability of independent trains pursuant to 10 CFR 50.73(a)(2)(vii). The condition prohibited by TS was rectified by the calibration of the pressure switches by the initial surveillance testing on December 19, 2005. The common-cause of the inoperability was rectified by the implementation of EC 63114 which raised the setpoints to allow adequate margin based on a revised uncertainty calculation on January 9, 2006.

**IV. CORRECTIVE ACTIONS**

The corrective action to prevent recurrence was to develop and implement Engineering Change (EC) 63114. EC 63114 accounts for the vendor's increased repeatability specification from 1.5% to 3.0% and provides increased margin to the TS Limit of greater than or equal to 950 psig. This corrective action was completed on January 9, 2006.

Additional corrective actions are to revise the vendor manual to reflect the latest information on the repeatability specification and to revise the maintenance calibration procedure to incorporate lessons learned from bench testing which result in a setpoint that is less subject to a "shift" in results due to the characteristics of this switch.

**V. PREVIOUS SIMILAR EVENTS**

No previous HNP events or conditions are known within the last five years where multiple Turbine Generator (EHC) Low Fluid Pressure Switches became inoperable due to inadequate margin in the setpoint calculation.