Progress Energy

MAY 18 2009

Serial: HNP-09-058
10 CFR 50.73

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

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2009-001-00

Ladies and Gentlemen:

The enclosed Licensee Event Report (LER) 2009-001-00 is submitted in accordance with 10 CFR 50.73, paragraph (a)(2)(i)(B) as a condition prohibited by the plant Technical Specifications. This report describes the discovery of an incorrect calibration of dropout voltage for two undervoltage relays. In accordance with 10 CFR 50.73(a) requirements, this LER is submitted within 60 days following discovery of the event.

This document contains no Regulatory Commitments.

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

Sincerely,

Kelvin Henderson
Plant General Manager
Harris Nuclear Plant

KH/kms

Enclosure

cc: Mr. J. D. Austin, NRC Senior Resident Inspector, HNP
Mr. L. A. Reyes, NRC Regional Administrator, Region II
Ms. M. G. Vaaler, NRC Project Manager, HNP

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NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 80 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.

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 3

4. TITLE

Emergency Bus 1A-SA Undervoltage Relay As Found Dropout Voltage did not meet TS Allowable Values

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
									N/A	05000
03	18	2009	2009	- 001 -	00	05	18	2009	FACILITY NAME: N/A	DOCKET NUMBER: 05000

9. OPERATING MODE

1

10. POWER LEVEL

100

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
David H. Corlett – Supervisor, Licensing/Regulatory Programs	(919) 362-3137

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
N/A	N/A	N/A	N/A	N					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On January 26, 2009, while Harris Nuclear Plant was operating at full power, a channel calibration was performed on the 6.9 kV Emergency Bus 1A-SA undervoltage relays. During the calibration, two Model 12NGV13 relays did not meet the Technical Specification Allowable Value requirement for dropout voltage. Plant Technical Specification (TS) Table 3.3-3, Loss-of-Offsite Power functional unit, requires a minimum of two operable channels per bus for that channel to be considered operable. If the minimum number of channels is not restored within one hour, the affected diesel generator is declared inoperable. On March 18, 2009, a Reportability Evaluation concluded that the improper setting of the primary undervoltage relays resulted in operation outside TS parameters, a condition prohibited by TS and a reportable event per 10 CFR 50.73.

The root cause of this event was determined to be an unavailability of information concerning the effect of relay coil voltage level on dropout setting. A review of procedure and calibration history indicated that prior to mid-1998, relay calibrations were performed with a starting input voltage of ≈120 V applied to the relay coil. From mid-1998 through the 2007 channel calibration, a starting input voltage of 95 V, enough of a voltage level to "reset" the dropout contacts, was applied to the relay coil. However, for the 2009 calibration, the starting input voltage was returned to 120 V applied to the relay coil, reflecting normal plant condition. This link between the relay coil voltage level and dropout setting was confirmed through bench testing after the 2009 calibration. Corrective actions taken were calibration of the affected 1A-SA relays using the correct starting input voltage, verification that the same model 1B-SB relays were calibrated properly and planned testing of the same model relays in other applications with a nominal 120 V starting point.

There were no safety consequences impacting plant or public safety as a result of this event. The Emergency Bus 1A-SA undervoltage relay would have performed its required actions upon loss of electrical power, although it would have experienced a delay of approximately 1 millisecond (ms). This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by plant Technical Specifications.

NARRATIVE

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

I. DESCRIPTION OF EVENT

At the start of this event, Harris Nuclear Plant was in Mode 1 at 100% power. Plant average temperature was 588.8 degrees and plant pressure was 2235 psig. There were no additional structures, systems or components inoperable at the beginning of the event that contributed to the severity of the event.

On January 26, 2009, at 0910, performance of MST-E0075, "6.9 kV Emergency Bus, 1A-SA and 1B-SB undervoltage (Loss of Voltage) Channel Calibration," was authorized. This Maintenance Surveillance Test (MST) provides compliance with Technical Specification (TS) 4.3.2.1 surveillance requirements for Limited Condition for Operation (LCO) 3.3.2 regarding the operability of applicable Engineered Safety Features Actuation System (ESFAS) instrumentation channels and interlocks.

The 6.9kV Emergency Bus [EK] 1A-SA undervoltage relays [27] 27-2/1729 and 27-3/1729 should trip within the Allowable Value parameters established by TS Table 3.3-4 (ESFAS Instrumentation Trip Setpoints), Function 9.a (Loss of Offsite Power). However, while performing MST-E0075 on January 26, 2009, the "as found" data for the 6.9kV Emergency Bus 1A-SA Primary undervoltage relays 27-2/1729 and 27-3/1729 were below the TS Allowable Value dropout voltage requirements, as follows:

27-2/1729 Contact 3-4 was 77.0 V, Contact 7-8 was 77.1 V, below TS Allowable Value of ≥ 78.2 V

27-3/1729 Contact 3-4 was 77.5 V, Contact 7-8 was 77.7 V, below TS Allowable Value of ≥ 78.2 V

II. CAUSE OF EVENT

The root cause of this event was the unavailability of information regarding the effect that a change in the starting input voltage applied to the relay coil would have on the corresponding dropout setting. When the starting input voltage applied to the relay coil was returned to 120 V for the 2009 performance of MST-E0075, the effects on the associated change in dropout setting value were not known.

A review of past calibration data found the Model 12NGV13 relays used for 6.9 kV Emergency Bus Primary and Reactor Coolant Pumps [P] undervoltage protection have been reliable and repeatable. Review of procedure revision history shows changes in the test methodology, related to improvements in available M&TE, and in procedure content over the years. Changes in procedure content include the removal of some test parameters (input voltage) from the procedures due to their inclusion in the computer control program. Other critical test parameters (such as setpoints, time setting) are retained in the procedure.

During the initial development of MST-E0075 in 1998, the starting input voltage applied to the relay coil was changed from ≈120 V to 95 V, as this voltage level was enough to "reset" the dropout contacts. When MST-E0075 was revised in 2007, the starting input voltage applied to the relay coil was changed back to 120 V, to reflect the nominal relay voltage under normal plant conditions. At that time, information was not available to indicate that the change in the relay coil voltage level would affect the dropout setting. After the 2009 calibration, this link between the relay coil voltage level and dropout setting was confirmed through bench testing, which verified that starting at a higher voltage resulted in a lower dropout.

III. SAFETY SIGNIFICANCE

There were no safety consequences impacting plant or public safety as a result of this event. The purpose of Emergency Bus 1A-SA "Loss of Voltage" undervoltage relay (also known as the primary undervoltage relay) is to isolate the bus from the preferred power source (offsite power) upon loss of electrical power and then to initiate load shedding and operation of the Emergency Diesel Generator [DG]. Although these actions would still have occurred with the Emergency Bus 1A-SA "Loss of Voltage" undervoltage relay calibrated such that it did not meet the TS Allowable Value dropout voltage requirement, the actions would have started approximately 1 ms later.

NARRATIVE

Potential Safety Consequences:

The only potential safety consequences are related to how the setpoint calibration error on the primary undervoltage relays could affect the timing of the diesel start signal on a loss of voltage. Based on the operating curves for NGV relays, a ~1.5 V calibration error will result in a ~1 ms delay. The delay time is based on a drop from 110% of nominal voltage (120 V) to 50% of the dropout voltage setting (~40 V). A Harris Engineering Calculation allows a maximum setting of 1.12 seconds with a TS Table 3.3-4 Allowable Value of ≤ 1.5 seconds. The last performance of MST-E0075 was reviewed for both safety busses and the additional 1ms delay would not have resulted in a TS violation or out of range time setting. The additional delay due to the calibration error did not have any significant effect on the protective features of the primary undervoltage relays.

IV. CORRECTIVE ACTIONS

The affected 1A-SA relays were recalibrated per MST-E0075 and the test was satisfactorily completed on January 26, 2009. Additionally, the same model 1B-SB relays were also checked. Since the extent of condition was Model 12NGV13 relays with Allowable Values defined in TS, additional UV relays will also be tested at a nominal 120 V starting point.

Process verification steps are being added to procedures performed with Pulsar software, Pulsemaster and Advanced Visual Test Software (AVTS), which will provide a listing with critical test parameters and description of the test being performed automatically by the Pulsar software. Setpoint changes for emergency bus primary UV relays are being implemented to increase the margin between setpoint and Allowable Value.

V. PREVIOUS SIMILAR EVENTS

A review of LER and Action Requests over the past five years identified one similar Action Request (AR):

AR 231046, originated April 26, 2007 - Undervoltage Relays for the 1A-SA Bus were found out of calibration while performing MST-E0075 on undervoltage relays 27-3/1729. The remaining 2 of 3 logic for the 1A safety bus undervoltage protection remained operational. The apparent causes were determined to be design differences between relay types and effects on calibration methodologies, not identified until after the relays had been accepted and installed, and the failure of calibration procedures to forewarn users of the possibility of unintentionally affecting other contact pair setpoints when adjusting a target contact pair setpoint. The potential link between the relay coil voltage level and dropout setting was not a factor in this 2007 report.