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Harris Nuclear Plant  
PO Box 165  
New Hill NC 27562

SEP 1 2000

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

Serial: HNP-00-134  
10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1  
DOCKET NO. 50-400  
LICENSE NO. NPF-63  
LICENSEE EVENT REPORT 2000-006-00

Sir or Madam:

In accordance with 10CFR50.73, the enclosed Licensee Event Report is submitted. This report describes a Technical Specification violation caused by an inoperable safety-related 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)

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.

**LICENSEE EVENT REPORT (LER)**

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

FACILITY NAME (1)

Harris Nuclear Plant, Unit 1

DOCKET NUMBER (2)

05000400

PAGE (3)

1 OF 4

TITLE (4)  
Technical Specification Violation Due To Inoperable Emergency Core Cooling System Valve

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
08	02	2000	2000	006	00	08	31	2000		05000
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more) (11)								
		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)		
POWER LEVEL (10)	100	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)		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
A	BQ	20	LIMITORQUE	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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On August 2, 2000 with Harris Nuclear Plant (HNP) at 100% power, the "A" Residual Heat Removal (RHR) pump discharge to charging safety injection pump (CSIP) suction header isolation valve (1RH-25), failed to open during performance of periodic surveillance testing. Subsequent investigation revealed that a torque switch control circuit modification had been incorrectly implemented during the previous refueling outage, and post modification inspections and testing did not identify the control circuit problem. The modification implementation error caused 1RH-25 to be inoperable for approximately two and half months. This resulted in a violation of Technical Specifications (TS) 3/4.5.2 and TS 3.0.4.

**Causes of this event:**

- (1) Inattention to detail in implementing the modification for 1RH-25.
- (2) Inattention to detail in developing appropriate post-modification testing.

**Corrective actions include:**

- (1) Repaired and retested 1RH-25.
- (2) Revise applicable plant procedures used when performing motor-operated valve (MOV) maintenance to increase the level of detail concerning limit switch set up and add requirements for independent verification and/or continuity checks of MOV limit switch contacts.
- (3) Revise applicable post-maintenance test plant procedure to add requirements for electrical continuity or current flow checks of MOV limit switch contacts.

NRC FORM 366A  
(6-98)LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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		2000	-- 006	-- 00	

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

I. DESCRIPTION OF EVENT

On August 2, 2000 with Harris Nuclear Plant (HNP) at 100% power, the "A" Residual Heat Removal (RHR) pump discharge to charging safety injection pump (CSIP) suction header isolation valve (1RH-25)(EIIS BQ-20), failed to open during performance of periodic surveillance testing. Subsequent investigation revealed that a torque switch control circuit modification had been incorrectly implemented during the previous refueling outage, and post modification inspections and testing did not identify the control circuit problem. The modification implementation error caused 1RH-25 to be inoperable for approximately three months. This resulted in a violation of Technical Specifications (TS) 3/4.5.2 and TS 3.0.4.

During performance of surveillance test procedure OST-1008 on 8/2/00, 1A-SA RHR Pump Operability Quarterly Interval, 1RH-25 did not open for its stroke time test. 1RH-25 was declared inoperable at 02:20 and a 72-hour LCO action statement was entered in accordance with the plant technical specifications. Subsequent troubleshooting revealed that one of the limit switch rotors was incorrectly aligned and the valve operator circuitry had de-energized due to torque switch actuation.

1RH-25 is an AC powered motor operated gate valve that provides a flow path to the CSIP suction header from the discharge of the "A" RHR pump. This flow path provides one redundant train of flow to the CSIP suction header from the containment sump during the post LOCA recirculation phase of operation.

Engineering Service Request ESR 99-00008 was implemented during the preceding refueling outage to modify several design attributes of motor operated valve 1RH-25. One change specified was to change the opening torque switch bypass contact logic so that the torque switch would be bypassed for 96% of the opening stroke instead of only the first 4% of the stroke. This change was specified to prevent possible torque switch actuation from defeating the safety function of the valve, which is to open. This modification package specified the post-modification acceptance test requirements for the work.

Post-modification testing requirements for this type of work are governed by plant procedures EGR-NGGC-0005, Engineering Service Requests, EGR-NGGC-0155, Specifying Electrical / I&C Modification Related Tests, and PLP-400, Post-Maintenance Testing. EGR-NGGC-0005 is the overall governing procedure for plant modifications that requires post-modification testing to be specified and conducted. EGR-NGGC-0155 includes instructions to specify pre-tests to verify, to the maximum extent possible, that the modification is properly installed and to ensure that post-modification tests prove that all redundant circuit paths are installed as designed and have continuity. PLP-400 includes specification of the following tests: Stroke Time Test, Remote Position Indication Verification, Stroke or Cycle Test, Non-IST Cycle Twice Test, Functional Test, and Static VOTES Test.

Maintenance contract workers implemented the design changes specified by ESR 99-00008 for 1RH-25. During this work, limit switch rotor No. 3 was set up incorrectly (90 degrees out of alignment). Concurrent verification of this work did not identify the limit switch rotor misalignment. The post-modification tests were performed as specified by the ESR. However, these tests did not identify the problem because the testing specified was inadequate for detecting the limit switch rotor misalignment.

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Sequence of Events:

On 12/2/99 ESR 99-00008 was approved to modify several design attributes of motor-operated valve 1RH-25. One change specified was to change the opening torque switch bypass contact logic so that the torque switch would be bypassed for 96% of the opening stroke instead of only the first 4% of the stroke. This change was specified to prevent possible torque switch actuation from defeating the safety function of the valve, which is to open. This modification package specified the post-modification acceptance test requirements for the work.

On 4/29/00, during the first half of the 6PM to 6AM night shift maintenance contract workers implemented the design changes specified by ESR 99-00008 for 1RH-25. During this work, limit switch rotor No. 3 was set up incorrectly (90 degrees out of alignment). Concurrent verification that was required by the work package instructions for this work did not identify the limit switch rotor misalignment.

On 5/1/00 the post-modification tests specified by the ESR were conducted. This testing included a stroke time test, remote position indication test, static VOTES test, and back-to-back strokes to verify thermal overload and control circuit fuse size selection. These tests passed because the parallel circuit of the torque switch masked misalignment of the torque switch bypass limit switch contact. The testing did not check the parallel contacts separately.

On 5/30/00 OST-1008 was performed. This was the first performance of the periodic surveillance test after implementation of ESR 99-00008. During this test, 1RH-25 stroked successfully because the parallel circuit of the torque switch masked misalignment of the torque switch bypass limit switch contact.

On 8/2/00 OST-1008 was performed. This was the second performance of the periodic surveillance test after implementation of ESR 99-00008. During this test 1RH-25 failed to open. Troubleshooting revealed that one of the limit switch rotors was incorrectly aligned and the valve operator circuitry had de-energized due to torque switch actuation during break away from the seat. The limit switch rotor misalignment was corrected and the valve retested.

II. CAUSE OF EVENT

- (1) Inattention to detail in implementing the modification for 1RH-25.
- (2) Inattention to detail in developing appropriate post modification testing.

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

III. SAFETY SIGNIFICANCE

Failure of 1RH-25 to open prevents the "A" train of RHR from being used as a source of suction by the charging safety injection pumps during the recirculation phase of core cooling following a LOCA. This failure could be safety significant because it is a loss of redundancy of critical core cooling flow paths and because failure of 1RH-25 to open has a risk achievement worth of 2.32 according to the plant probabilistic safety analysis (PSA) model. This PSA model shows that the core damage frequency increases from 5.017E-5 to 1.29E-4 when 1RH-25 fails to open. However, addition to the PSA of an Operator action to manually open the valve greatly reduces the safety significance of this event such that it is not safety significant. Manual operation of 1RH-25 using the hand wheel is within the normal skill base for the Operators. The revised PSA model which includes credit for Operator action shows that the core damage frequency increases from 5.017E-5 to 5.044E-5 when 1RH-25 initially fails to open and is then manually opened. This increase is not safety significant. Additionally, the torque switch can be bypassed by use of the torque switch bypass control switch on the main control board. The design of this bypass feature would allow operators to bypass the torque switch and operate 1RH-25 from the main control room.

This report is being submitted pursuant to the criteria of 10CFR50.73(a)(2)(i) for any operation or condition prohibited by the plant's Technical Specifications.

IV. CORRECTIVE ACTIONS

**Completed corrective action:** (1) Repaired and retested 1RH-25. **Planned corrective actions:** (1) Revise applicable plant procedures used when performing motor-operated valve (MOV) maintenance to increase the level of detail concerning limit switch set up and add requirements for independent verification and/or continuity checks of MOV limit switch contacts. (2) Revise applicable post-maintenance test plant procedure to add requirements for electrical continuity or current flow checks of MOV limit switch contacts.

V. SIMILAR EVENTS

There have been no previous reportable events at HNP where an inadequate implementation of a modification and inadequate post modification testing of a MOV resulted in a TS violation.