



JAN 04 2008

Serial: HNP-07-177  
10 CFR 50.73

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 2007-005-00

Ladies and Gentlemen:

The enclosed Licensee Event Report 2007-005-00 is submitted in accordance with 10 CFR 50.73. This report describes a condition prohibited by Technical Specifications (TS) in that the 'B' train of Essential Services Chilled Water was inoperable for a period longer than allowed by TS 3.7.13.

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, appearing to read 'Kelvin Henderson', followed by the word 'for'.

Kelvin Henderson  
Plant General Manager  
Harris Nuclear Plant

KH/adz

Enclosure

cc: Mr. P. B. O'Bryan, NRC Sr. Resident Inspector  
Ms. M. G. Vaaler, NRC Project Manager  
Mr. V. M. McCree, NRC Regional Administrator

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

Handwritten initials 'JE22' in a stylized, bold font.

Handwritten initials 'NRR' in a stylized, bold font.

<b>NRC FORM 366</b> (9-2007)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		APPROVED BY OMB: NO. 3150-0104  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.		EXPIRES: 08/31/2010				
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)										
1. FACILITY NAME Harris Nuclear Plant - Unit 1					2. DOCKET NUMBER 05000400		3. PAGE 1 OF 3			
4. TITLE 'B' Train of Essential Services Chilled Water was inoperable for a period longer than allowed by Technical Specifications										
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
11	5	2007	2007	- 005 -	00	1	4	2008	N/A	05000
9. OPERATING MODE  1									11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)	
10. POWER LEVEL  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 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 Dave Corlett, Supervisor - Licensing/Regulatory Programs									TELEPHONE NUMBER (Include Area Code) (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	
D	KM	CHU	York	Y						
14. SUPPLEMENTAL REPORT EXPECTED					15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR	
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)										
<p>At 01:44 on 11/5/07, while performing a safety train equipment realignment to 'B' train, the 'B' Essential Services Chilled Water (ESCW) chiller tripped due to low refrigerant pressure. The root cause of this event was that post-maintenance testing was inadequate in detecting leakage from the chiller to the receiver tank, resulting in a loss of refrigerant. This leakage occurred as a result of valve 1CY-7 not being fully shut following maintenance that required evacuating all refrigerant. Full evacuation of 'B' chiller is an infrequent evolution that has been conducted less than five times since placing the Harris plant online in 1987. The post-maintenance testing that was performed on the chiller consisted of external leak checks and a series of tests to verify functionality and operability of the chiller following maintenance. The tests performed were unable to detect the presence of leakage internal to the system from the turbopak to the receiver tank.</p> <p>Not achieving tight shut-off through 1CY-7 resulted in leakage of refrigerant to the transfer tank after the chiller had been declared operable following completion of maintenance and testing. This leakage ultimately caused the inoperability of the 'B' ESCW chiller. Planned corrective actions to prevent recurrence include revising two procedures to require evacuation of the receiver tank following refrigerant transfer to ensure an internal leak path to the receiver does not exist.</p>										

## LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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**NARRATIVE**

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

### I. DESCRIPTION OF EVENT

The plant was operating in mode 1 at 100% power at the time of the chiller trip. On 10/6/07 the 'B' chiller [CHU] of the ESCW system [KM] was shutdown for maintenance during Refueling Outage (RFO) 14. Part of the maintenance scope was to replace the compressor with a spare. The maintenance activities on the compressor required that the refrigerant be transferred to the receiver tank for temporary storage. Full refrigerant evacuation of 'B' chiller is an infrequent evolution that has been conducted less than five times since placing the Harris plant online in 1987. Prior to transferring the refrigerant to the receiver tank, the tank pressure boundary was checked per procedure. Based on entries from the RFO-14 ESCW project log, it is evident that the receiver tank held a vacuum from the time it was initially established on 5/16/07, indicating that there was no leakage at the receiver tank pressure boundary.

After completion of the maintenance, on 10/13/07, operations conducted a pressurized liquid transfer from the receiver tank to the turbopak. Following completion of the refrigerant transfer, the chiller refrigerant transfer valves were realigned to their operational position and independently verified. During the refrigerant transfer, 1CY-7 was not fully shut resulting in leakage of refrigerant from the turbopak to the receiver tank.

After all ESCW maintenance was completed in RFO-14 and the applicable clearances removed, the 'B' ESCW chiller was tested and restored to operable status. The post-maintenance testing performed at this time was inadequate to reveal that there was leakage past 1CY-7. The chiller was started and stopped several times during the 'B' safety train testing portion of RFO-14. After all 'B' safety train testing was completed, the 'B' ESCW chiller was run continuously from 11:50 on 10/20/07 to 09:55 on 10/23/07. On 10/23/07 at 09:55 the 'B' ESCW chiller was shutdown when the 'A' safety train was put in service during a scheduled safety train swap.

The next scheduled safety train swap was 11/5/07. During the train swap activities on 11/5/07, the 'B' ESCW chiller was started and tripped on low evaporator pressure after running for two minutes. During troubleshooting it was discovered that the receiver tank, which had been left empty at the completion of maintenance on 10/13/07, indicated ¼ full. Upon finding the 'B' ESCW chiller receiver tank ¼ full, operations performed a valve line-up on the refrigerant transfer system boundary. During the valve line-up it was found that 1CY-7 could be turned approximately 1/16 to 1/8 turn farther in the shut direction.

At some time between 10/23/07 at 09:55 and 11/5/07 at 01:44, enough refrigerant had leaked from the turbopak to the receiver tank to render the chiller inoperable. The 'B' ESCW chiller was restored to an operable condition on 11/5/07 at 19:16. Based on available information, sufficient evidence does not exist to provide reasonable assurance that the 'B' ESCW chiller was operable at 01:44 on 11/2/07, 72 hours prior to the trip. The conclusion, therefore, is that the 'B' chiller was inoperable greater than the 72 hours allowed by Technical Specification 3.7.13 and that this condition is reportable under 10 CFR 50.73.a.2.i.B as a condition prohibited by Technical Specification. During the period of 10/23/07 through 11/5/07, the 'A' ESCW system was in service and fully functioning to supply all required loads. There was no other inoperable equipment at the time of the chiller trip that contributed to this event.

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**NARRATIVE**

### II. CAUSE OF EVENT

The root cause of this event is that the post-maintenance testing was not adequate to detect leakage of refrigerant to the receiver tank. The tests performed following this infrequent maintenance item were unable to detect the presence of leakage internal to the system from the turbopak to the receiver tank.

A contributing cause of this event was that the task to shut 1CY-7 was poorly performed by the non-licensed operator. There were no unusual characteristics of the work location that directly contributed to this event.

Another contributing cause was that there is no periodic monitoring of receiver tank level performed that would allow detection of refrigerant transfer leading to loss of chiller function.

### III. SAFETY SIGNIFICANCE

The failure of the B ESCW chiller to start and run reliably prevented the 'B' train chiller from providing nominal 44 degree F inlet chilled water to cooling coils in the Air-Handling units associated with plant safety systems. This condition is reportable under 10 CFR 50.73.a.2.i.B as a condition prohibited by Technical Specifications. During the period of 10/23/07 through 11/5/07, the 'A' ESCW system was in operation and fully functioning to supply all required loads.

#### Potential Safety Consequences:

If a Design Basis Accident had occurred between 10/23/07 at 09:55 through 11/5/07 at 19:16, the 'B' ESCW train would not have been capable of performing its safety related functions. The corresponding consequences of having 'B' ESCW incapable of performing safety related functions are minimized by the existence of the 100% capacity redundant 'A' ESCW train. The 'A' ESCW train, which includes the 'A' chiller, was in service and fully functional during this time period.

### IV. CORRECTIVE ACTIONS

The most practical means of preventing recurrence of the root cause of this failure is to revise two procedures to require an evacuation test of the receiver tank following refrigerant transfers. Successful completion of this test will ensure that leakage from the turbopak to the receiver will not occur.

There are three corrective actions to address the failure to fully shut 1CY-7. The first corrective action is to coach the individual responsible and all independent verifiers involved on expected performance and work practices. An additional corrective action is specified to revise the Operating Procedure to specify tight closure of 1CY-7 and to provide caution statements informing the operator of the consequences of leakage past 1CY-7. The third corrective action is to brief the entire operations staff regarding the lessons learned from this investigation.

The corrective action to address the lack of monitoring is to revise the system Trending Basis Document to monitor receiver tank level once per day on Reactor Auxiliary Building (RAB) operator rounds. The RAB operator rounds will also be revised to add the monitoring requirement.

### V. PREVIOUS SIMILAR EVENTS

There are two previous similar events that resulted in ESCW system being inoperable for a period longer than allowed by Technical Specifications. While the events are somewhat similar in nature, the corrective actions taken could not be expected to prevent an event such as the trip on 11/5/2007.