



**Progress Energy**

**DEC 16 2003**

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

Serial: HNP-03-153  
10CFR50.73

**SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1  
DOCKET NO. 50-400/LICENSE NO. NPF-63  
LICENSEE EVENT REPORT 2003-006-00**

Ladies and Gentlemen:

The enclosed Licensee Event Report 2003-006-00 is submitted in accordance with 10 CFR 50.73. This report describes degradation of the Main Control Room Emergency Filtration System.

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/rg

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)

IE22

<b>NRC FORM 366</b> (7-2001)	<b>U.S. NUCLEAR REGULATORY COMMISSION</b>	<b>APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004</b> Estimated burden per response to comply with this mandatory information 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 Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)		

<b>1. FACILITY NAME</b> Harris Nuclear Plant – Unit 1	<b>2. DOCKET NUMBER</b> 05000400	<b>3. PAGE</b> 1 OF 5
--	-------------------------------------	--------------------------

**4. TITLE**  
Main Control Room Emergency Filtration System Degradation

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
10	17	2003	2003	006	00	12	16	2003	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	10. POWER LEVEL	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
		20.2201(b)	20.2203(a)(3)(ii)	X 50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
1	100	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)	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) OTHER Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	
		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)	X 50.73(a)(2)(v)(D)	
		20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	X 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 Robert Hill – Lead Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (919) 362-2033
---	--

**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

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

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

Harris Nuclear Plant (HNP) personnel conducted surveillance testing of the Control Room Emergency Filtration System (CREFS) on October 17, 2003. Test results were inconsistent with past surveillances; as a result, interim administrative controls were established to ensure CREFS remained operable. An investigation identified two boundary leakage paths that allowed interaction between CREFS and the non-safety ventilation system in an adjacent area.

The condition could have prevented CREFS from meeting its required design function under various operating configurations of the non-safety ventilation system.

The root causes were inadequate design analyses and configuration controls related to the two boundary leakage paths. Corrective actions isolated the two identified leakage paths. Additional corrective actions will ensure the non-safety ventilation system is secured following receipt of a control room isolation actuation.

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET NUMBER (2)	6. LER NUMBER			3. PAGE
Harris Nuclear Plant – Unit 1	05000400	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2003	- 006	- 00	

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

I. DESCRIPTION OF EVENT

The Main Control Room (MCR) Emergency Filtration System (CREFS) [VI] is required per Technical Specification (TS) 3/4.7.6 to develop a positive pressure relative to all adjacent areas of greater than or equal to 0.125 inches water gauge (INWG). A surveillance test is required every 18 months to ensure the CREFS ability to meet this requirement.

Harris Nuclear Plant (HNP) personnel conducted surveillance testing of the Control Room Emergency Filtration System (CREFS) on October 17, 2003 with the plant in mode 1 at 100% power. Test results were inconsistent with past surveillances. An investigation was initiated to determine the cause of the inconsistent data. The investigation revealed that additional detail was required in the procedure to ensure the differential pressures between the control room and all adjacent areas were tested. In addition, a pressure transmitter did not always provide accurate indication of the pressure difference between the control room and the outside air. Interim administrative controls were established on October 18, 2003 to ensure CREFS remained operable.

A test using the revised procedure and subsequent investigation identified two boundary leakage paths that allowed interaction between CREFS and the non-safety ventilation system in an adjacent area. One was through open drain valves and loop seals on air recirculation units, but the loop seals were undersized to maintain isolation in all configurations of the ventilation equipment. The second was through a block wall separating the control room from a pipe chase; the block wall was porous and the discovered condition allowed air to leak through the wall. The combination of the two identified conditions could have prevented CREFS from meeting its required design function under various operating configurations of the non-safety ventilation system. Both trains of CREFS were considered to be inoperable for a period of time greater than allowed by technical specifications, but the time at which the systems became inoperable could not be determined. The last satisfactory performance of the surveillance test was April 30, 2002.

II. CAUSE OF EVENT

The root causes were inadequate design analyses and configuration controls related to the two boundary leakage paths. The drain valves on the air recirculation units were opened in 1992 without an analysis that verified adequate design of the loop seals. Operation of the ventilation equipment could cause the water to be emptied from the loop seal, resulting in a lack of isolation between the two ventilation systems. In addition, the design analyses did not address the impact of all operation and failure modes of the non-safety ventilation system on operability of the CREFS.

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET NUMBER (2)	6. LER NUMBER			3. PAGE	
Harris Nuclear Plant – Unit 1	05000400	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5	
		2003	- 006	- 00		

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

III. SAFETY SIGNIFICANCE

There were no safety significant consequences as a result of this event. No events have occurred that resulted in radiation dose to the operators in the control room exceeding the General Design Criteria or that resulted in operators receiving any significant increased radiation dose.

During normal operation (pre-accident) conditions the MCR is required to be maintained at a positive pressure of at least 1/8 INWG relative to adjacent areas. No evidence was discovered during the investigation that indicate a failure of the normal non-safety Control Room Ventilation system to satisfy the FSAR description for conditions at the beginning of a design basis accident.

The normal RAB ventilation configuration is one supply fan and at least three exhaust fans. With one supply and at least three exhaust fans in operation, the MCR is pressurized as required to 1/8 INWG above surrounding areas. The discrepant condition was limited to an unusual RAB Normal Ventilation lineup allowed by procedures with a single exhaust fan in operation. This resulted in the observed discrepant condition with a unacceptable pressure in the MCR during operation of either the A or B Train of CREFS.

During a design basis Loss of Coolant Accident (LOCA) and other accidents resulting in Safety Injection (SI), the SI causes control room ventilation isolation, securing normal RAB ventilation, and initiation of RABEES. The automatic actions maintain compliance with design and licensing bases for the known discrepant conditions. Six other design basis events are analyzed for potential radiological dose to the control room operators, but do not have an automatic SI to secure RAB Normal Ventilation. Of these six events, a Loss of Offsite Power (LOOP) is one that results in termination of RAB Normal Ventilation, resulting in no safety impact. The five remaining design basis events could cause the control room to be at less than 1/8 INWG positive relative to the outside, leading to possible contaminated air intrusion into the MCR requiring manual action by the operators to mitigate the impact.

Postulated single failure of RAB Normal Ventilation, with a supply fan running but no exhaust fans in operation, could result in the control room being at a lower pressure than the RAB, which could lead to contaminated air intrusion into the control room from the RAB, also requiring mitigating manual actions by the operations staff.

The licensing basis for smoke infiltration is satisfied as described above for normal pre-accident conditions. An RAB ventilation lineup of a supply fan running with no exhaust fans, although not allowed by operating procedures could possibly result in the RAB at a positive pressure relative to the control room. This could result in smoke infiltration to the control room for some fires in the RAB. The impact is mitigated by the very low likelihood of being in the specific configuration, by the availability of self-contained breathing apparatus for the operations staff, and the availability of smoke purge capability in the MCR. Another abnormal lineup could be a loss of the RAB supply fan with multiple exhaust fans in operation. This could result in a negative pressure in the control room relative to outside air, which would be mitigated by immediately securing all but one exhaust fan and placing control room ventilation in recirculation mode. This would only impact control room habitability for smoke in the outside air. The FSAR design bases identify that no credible hazardous chemical risks exist.

This report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications, 50.73(a)(2)(vii)(D) as a single cause or condition causing two independent trains to become inoperable in a single system designed to mitigate the consequences of an accident, 50.73(a)(2)(v) as a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident, and 50.73(a)(2)(ii) as a condition that resulted in the an unanalyzed condition that significantly degraded plant safety.

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET NUMBER (2)	3. LER NUMBER			3. PAGE	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Harris Nuclear Plant – Unit 1	05000400	2003	- 006	- 00	4	OF 5

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

IV. CORRECTIVE ACTIONS

Corrective actions include:

- 1- Revise the surveillance test to demonstrate that the TS criteria are satisfied. (complete)
- 2- Shut the loop seal drain valves and reflect the change in design documentation. (complete)
- 3- Perform an engineering change to permanently resolve the inadequate design analysis of the affects of RAB normal ventilation on MCR ventilation.
- 4- Verify the evaluation of other valve positions that were changed per the 1992 evaluation.

V. PREVIOUS SIMILAR EVENTS

HNP LER 00-001-00, Control Room Emergency Filtration System Technical Specification Violation, (Reported 03/23/00)

On February 22, 2000, HNP removed a duct access panel of the CREFS ventilation boundary to facilitate surveillance testing of the charcoal in the filtration unit. This access panel is located at the common suction line for the two redundant CREFS units. The approximate five minutes that the access panel was removed and the test panel installed the CREFS could not achieve and maintain a positive pressure as required by Technical Specifications. At the time of the event, HNP Technical Specifications (TS) did not provide an action when both CREFS are inoperable, thus requiring entry into TS 3.0.3. The cause was inadequate review of procedures that affect control room boundaries. The previous corrective actions evaluated the procedural guidance for opening passive barriers and, therefore, would not have prevented the event identified by this LER.

HNP LER 1999-008-00, Control Room Emergency Filtration System Technical Specification Noncompliance, (Reported 10/08/99)

During four refueling outages (RFO5, RFO6, RFO7, and RFO8), HNP failed to comply with Technical Specifications (TS) 3.7.6 "Control Room Emergency Filtration System." During these four occasions, the pressure boundary doors for the HNP Control Room Emergency Filtration System (CREFS) were blocked open to allow electrical cables to pass through the opening. Blocking open pressure boundary doors for the CREFS would require additional operator actions to restore the pressure boundary in the event of an accident. The additional operator action of unblocking the pressure boundary doors had not been adequately reviewed with regards to design basis and to licensing basis requirements.

This previous LER was evaluated in the failure analysis for this event to assess the potential of a repeat failure or common cause. The investigation in 1999 concluded that site personnel failed to recognize that blocking open Control Room Emergency Filtration System boundary doors was a change to the facility and as a result did not perform an adequate 10 CFR 50.59 review.

The corrective action to prevent recurrence was to revise procedures to clarify CREFS pressure boundary requirements and conduct training for applicable Operations and Engineering personnel. The significant changes to the 50.59 program as well as additional training, programmatic improvements and industry experience were credited as strengthening the program, limiting the extent of condition.

Although previous event is similar to the subject event, the previous corrective actions focused on inadequate 10 CFR 50.59 reviews and would not have prevented the event identified by this LER.

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET NUMBER (2)	3. LER NUMBER			3. PAGE	
Harris Nuclear Plant – Unit 1	05000400	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5	
		2003	- 006	- 00		

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

HNP CR 9701088

CR 9701088 identified that the MCR ventilation system developed a positive pressure while operating in recirculation mode (the MCR should not develop a positive pressure while in recirculation). MCR ventilation was shutdown and the positive pressure remained. The cause of the positive pressure in the MCR was attributed to the RAB being at a positive pressure. RAB normal ventilation was in service with one supply fan and three exhaust fans. However, the three exhaust fans were at reduced flowrates, and were unable to maintain a negative differential pressure in the RAB. The interaction of the RAB to the MCR was attributed to air leaks through floor drain loop seals, AH15 loop seals and R2 loop seals.

The investigation and corrective actions from CR 9701088 did not identify the pipe chase as an adjacent area. One of the corrective actions for this event includes defining the MCR boundary and "adjacent areas."

HNP LER 96-007-00, Failure to Perform Technical Specification Surveillance Testing in accordance with Specification 4.7.6.d.3, (Reported 05/28/96)

On April 25, 1996 HNP determined that the procedure for performing surveillance testing required by Technical Specification 3/4.7.6, Control Room Emergency Filtration System (CREFS), did not fully implement the 18 month surveillance testing requirements. The test only measured differential pressure for one of five adjacent areas. The cause of the inadequately developed test procedure was due to an incorrect interpretation of the necessary testing.

The cause determination did not identify the all the adjacent areas or identify the influence of the RAB normal ventilation. Corrective actions for this event include revising the surveillance test procedure and defining the MCR boundary and "adjacent area."