

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (4-95)					APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 60.0 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.</small>					
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)										
FACILITY NAME (1) River Bend Station					DOCKET NUMBER (2) 05000-458		PAGE (3) 1 of 3			
TITLE (4) High Pressure Core Spray Minimum Flow Valve Discovered In Closed Position Apparently Due To Air In Transmitter Sensing Lines										
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
11	11	97	97	010	00	12	11	97	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000
OPERATING MODE (9)		1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)						
				20.2201(b)		20.2203(a)(2)(v)		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)		X 50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
				20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		
LICENSEE CONTACT FOR THIS LER (12)										
NAME D. N. Lorring, Supervisor - Licensing					TELEPHONE NUMBER (Include Area Code) 504-381-4157					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
SUPPLEMENTAL REPORT EXPECTED (14)					EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
X YES (If yes, complete EXPECTED SUBMISSION DATE).					NO		01	29	98	
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) <p>On November 11, 1997, at 1713 hours during testing of the High Pressure Core Spray System (HPCS) (*BG*) the minimum flow valve was discovered to be closed while the pump was running. No other discharge path for the pump was open at the time. Upon discovery of the closed valve condition, the operator took immediate action to open the minimum flow valve, and the test was completed. The HPCS minimum flow valve and the HPCS system were declared inoperable.</p> <p>Based on the initial investigation the most likely root cause for the initial minimum flow valve failure is considered to be air in the flow transmitter sensing lines. The sensing line from the HPCS pipe to the flow transmitter was vented at the high point vent. The HPCS pump was tested and no abnormalities noted. Low pressure emergency core cooling systems and the reactor core isolation cooling system were verified to be operable and capable of performing their safety function at the time of the event. This event has minimal safety significance.</p> <p>HPCS is a single train safety system, thus this condition is reportable per 10CFR50.73(a)(2) (v)(D) as a condition that could have prevented the fulfillment of a safety function of a system needed to mitigate the consequence of an accident. The final root cause and corrective action for this event will be provided in a supplement to this report.</p>										

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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
River Bend Station	05000-458	97	010	00	2 of 3

Reported Condition

On November 11, 1997, at 1713 hours, with the reactor in Mode 1 (power operation), at 100% power, during testing of the High Pressure Core Spray System (HPCS) (*BG*) the minimum flow valve was discovered to be closed while the pump was running. No other discharge path for the pump was open at the time. Upon discovery of the closed valve condition, the operator took immediate action to open the minimum flow valve, and the test was completed. The HPCS minimum flow valve and the HPCS system were declared inoperable. HPCS is a single train safety system, thus this condition is reportable per 10CFR50.73(a)(2) (v)(D) as a condition that could have prevented the fulfillment of a safety function of a system needed to mitigate the consequence of an accident.

Event Description

While performing the "HPCS Quarterly Pump And Valve Operability Test" the operator is directed to change the suction and discharge paths to facilitate the testing of the system and individual system components. The minimum flow valve section of this procedure was completed satisfactorily which verified proper automatic and manual operation of the minimum flow valve. Later in the procedure, the operator noticed the minimum flow valve was not open and the other discharge paths were closed. The valve should have been open due to low flow and high pressure at this point of the test. The operator took immediate action to open the minimum flow valve and the valve remained open. The test was completed and HPCS minimum flow valve and system were declared inoperable. The applicable technical specification limiting condition for operation was entered.

Investigation and Immediate Actions

Troubleshooting focused on the minimum flow valve logic including the pressure and flow inputs. The pressure instrument loop for the minimum flow valve was checked from the input to the trip unit through the relay logic to actually stroking the minimum flow valve. The flow instrument loop was checked from the current input to the trip unit through the relay logic overlapping with the previous test. Nothing was found which could have caused improper valve operation. These two steps demonstrated that the control panel instrumentation, relay logic, and minimum flow valve were working correctly.

Since computer records reviewed after the event indicated higher flow than expected during portions of the event, the sensing lines from the HPCS pipe to the flow transmitter were checked for air at the in-line high point vent. Air was found and vented. The transmitter was also vented and no air was found at the transmitter itself.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
River Bend Station	05000-458	97	010	00	3 of 3

Root Cause(s)

Based on the initial investigation the most likely root cause for the initial minimum flow valve failure is believed to be air in the flow transmitter sensing lines. No other abnormal conditions were discovered. Air was verified to be present at the flow transmitter lines' high point vents. The final root cause and corrective actions for this event will be provided in a supplement to this report.

Previous Occurrences

A review of the past five years of licensee event reports and site condition reports indicated no problems where the HPCS minimum flow valve failed to open.

Completed Corrective Actions

- Maintenance and System Engineering personnel conducted troubleshooting to determine the cause of the minimum flow valve failure.
- The sensing lines from the HPCS pipe to the flow transmitter were vented at the high point vents to remove air indicated by troubleshooting.
- The HPCS pump was run and no abnormalities were noted.

Safety Significance

The HPCS minimum flow valve performed satisfactorily several times during the test prior to the event. If it had been called upon prior to the event, it would have performed its intended safety function. The valve logic would cause the valve to automatically close if the high flow signal still existed. Since the minimum flow valve stayed open after it was manually opened, the condition apparently cleared during the first manual opening stroke. This indicates the minimum flow valve would not have remained shut long enough to damage the pump in a low flow high pressure condition.

The HPCS pump was not damaged during the relatively short time the minimum flow valve was closed. This is based on discussions with the vendor, pump operation after the event, and observations of individuals in the HPCS room while the pump was running after the minimum flow valve was re-opened. In addition, a subsequent HPCS pump run indicated no degradation of the pump occurred due to this event.

In addition, low pressure ECCS systems and the RCIC system were verified to be operable and capable of performing their safety function. Therefore, this event has minimal safety significance.

Note: Energy Industry Identification codes are identified in the text as (*XX*)