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February 26, 1998

U. S. Nuclear Regulatory Commission  
Document Control Desk, OP1-17  
Washington, DC 20555

Subject: River Bend Station - Unit 1  
Docket No. 50-458  
License No. NPF-47  
Licensee Event Report 50-458/97-010-01

File Nos. G9.5, G9.25.1.3

RBG-44392  
RBF1-98-0056

Ladies and Gentlemen:

In accordance with 10CFR50.73, enclosed is the supplemental report for Licensee Event Report 97-010 submitted on December 11, 1997. The expected submission date of this voluntary supplemental report was changed to February 27, 1998 per discussions with Mr. Elmo Collins of NRC Region IV staff. Please note that the report has been changed to voluntary as a result of our investigation into this issue.

Sincerely,

RJK/JPO  
enclosure

*IE221*

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cc: U. S. Nuclear Regulatory Commission  
Region IV  
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St. Francisville, LA 70775

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Mr. Jim Calloway  
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Louisiana Department of Environmental Quality  
Radiation Protection Division  
P. O. Box 82135  
Baton Rouge, LA 70884-2135  
ATTN.: Administrator



NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (4-95)					APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98														
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)										ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 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.									
FACILITY NAME (1)					DOCKET NUMBER (2)					PAGE (3)									
River Bend Station					05000-458					1 of 4									
TITLE (4)																			
High Pressure Core Spray Minimum Flow Valve Discovered In Closed Position 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	01	02	26	98	N/A			05000							
									FACILITY NAME			DOCKET NUMBER							
									N/A			05000							
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)																	
1		20.2203(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)			50.73(a)(2)(viii)								
POWER LEVEL (10)		20.2203(a)(1)																	
100		20.2203(a)(2)(i)			20.2203(a)(3)(i)			50.73(a)(2)(ii)			50.73(a)(2)(x)								
		20.2203(a)(2)(ii)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)			73.71								
		20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(iv)			<input checked="" type="checkbox"/> OTHER								
		20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(v)			Specify in Abstract below or in NRC Form 366A								
								50.73(a)(2)(vii)			Voluntary Report								
LICENSEE CONTACT FOR THIS LER (12)																			
NAME								TELEPHONE NUMBER (Include Area Code)											
D. N. Lorfing, Supervisor - Licensing								504-381-4157											
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs									
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR					
YES (If yes, complete EXPECTED SUBMISSION DATE).										<input checked="" type="checkbox"/> NO									
<b>ABSTRACT</b> (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>The root cause for the initial minimum flow valve failure was determined to be air in the flow transmitter sensing line high point due to a failure to properly vent those 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. Corrective action includes developing procedural guidance to specify the appropriate venting requirements for instrument line high point vents. This event has minimal safety significance.</p> <p>It was subsequently determined that this condition would not have prevented the fulfillment of a safety function of a system needed to mitigate the consequence of an accident and is not reportable. This report is being revised to reflect a voluntary submittal and contains no commitments.</p>																			

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**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. Subsequent engineering analysis determined that the HPCS system and instrumentation were capable of performing their safety function and no technical specification inoperable condition existed. This report is being submitted as a voluntary LER.

**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 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 identified which may have caused improper valve operation.

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.

Subsequently, minimum flow valves on two low pressure injection systems operated erratically and troubleshooting indicated that air was present at the high point vents in those systems as well.



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### Root Cause(s)

The root cause for the initial minimum flow valve failure was determined to be air in the flow transmitter sensing line high point due to lines not being properly vented. No other abnormal conditions were discovered. Air was verified to be present at the flow transmitter lines' high point vents. It was determined the lines were not being vented properly due to a lack of procedural guidance that required venting of high point vents.

### 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. Subsequent to the event described in this LER, the minimum flow valve for two low pressure injection systems behaved erratically due to air in the instrumentation line high points. Corrective actions from previous occurrences were inadequately implemented or were limited to venting at the instruments instead of the high point vents.

### 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.
- Following the discovery of air in RHR B and C transmitter sensing lines, a team of engineering, operations, and maintenance personnel reviewed safety related instrumentation to determine other susceptible transmitters. As a result, six additional locations were vented.
- An Operations Department Standing Order was issued to direct the venting of instrument lines with the high point vents when necessary.
- Instrumentation technicians and planners were made aware of the effects of entrapped air on instrumentation, and the need to vent instrumentation high point vents.

### Long Term Corrective Actions

- System configuration will be reviewed to identify other safety or risk significant instrumentation with high point vents.
- Procedural guidance will be developed specifying the appropriate venting requirements for instrument line high point vents. This will include a plan for periodic venting.
- Training on this issue will be provided to appropriate operation's and maintenance personnel.

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**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. 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\*)