

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555. AND TO THE PAPERWORK REDUCTION PROJECT (315)0104, OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1): RIVER BEND STATION  
DOCKET NUMBER (2): 0 5 0 0 0 4 5 8  
PAGE (3): 1 OF 0 4

TITLE (4): ESF Actuation When RWCU Isolation Valve Stroked Closed, Cause Unknown But May Have Been Operator Error

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISED NUMBER	MONTH	DAY	YEAR	FACILITY NAMES
0	9	91	91	018	01	09	03	92	
								DOCKET NUMBER(S): 0 5 0 0 0	
								0 5 0 0 0	

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

OPERATING MODE (9)	20.402(b)	20.405(a)	50.73(a)(2)(iv)	73.71(b)
4			X	
POWER LEVEL (10)	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0				
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
L. A. England, Director - Nuclear Licensing	5 0 4 3 8 1 1 - 4 1 1 4 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At approximately 1654 on 09/29/91 with the unit in Operational Condition 4 (Cold Shutdown) for the planned midcycle maintenance outage, an unanticipated engineered safety feature (ESF) actuation occurred when valve G33\*MOV004, outboard reactor water cleanup system (RWCU) isolation valve stroked closed. Per design, the low flow condition caused by the closure of this valve caused both of the RWCU pumps to trip. Approximately four minutes later, a second ESF actuation occurred while operators were attempting to restart the reactor water cleanup system pumps. Due to a problem with the programmable controller which controls the filter/demineralizer portion of the system, flow oscillations occurred upon restarting the first RWCU pump. After 45 seconds, the sensed flow differential resulted in all of the RWCU isolation valves closing. The root cause of this event is indeterminate. It is possible, however, that the operator did not depress the reset pushbuttons hard enough or long enough to ensure all of the isolation relays had time to reset. Indicating lights will be installed on the operator panel adjacent to the reset pushbuttons that will indicate if an isolation signal is present to a portion of the NSSSS logic. These two related events are being reported per 10CFR50.73(a)(2)(iv). This event did not affect the health or safety of the public.

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LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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DOCKET NUMBER (2)

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RIVER BEND STATION

0 | 5 | 0 | 0 | 0 | 4 | 5 | 8 | 9 | 1 | — | 0 | 1 | 8 | — | 0 | 1 | 0 | 2 | OF | 0 | 4

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

REPORTED CONDITION

At approximately 1654 on 09/29/91 with the unit in Operational Condition 4 (Cold Shutdown) for the planned midcycle maintenance outage, an unanticipated engineered safety feature (ESF) actuation occurred when valve G33\*MOVF004, (\*ISV\*), outboard reactor water cleanup system (RWCU) (\*CE\*) isolation valve stroked closed. Per design, the low flow condition caused by the closure of this valve caused both of the RWCU pumps (\*P\*) to trip. Approximately four minutes later, a second ESF actuation occurred while operators were attempting to restart the reactor water cleanup system pumps. Due to a problem with the programmable controller (\*PMC\*) which controls the filter/demineralizer (\*FDM\*) portion of the system, flow oscillations occurred upon restarting the first RWCU pump. After 45 seconds, the sensed flow differential resulted in all of the RWCU isolation valves closing. These two related events are being reported as unanticipated ESF actuations pursuant 10CFR50.73(a)(2)(iv).

INVESTIGATION

On 09/29/91 at approximately 1650, with the unit in Operational Condition 4, Operations transferred the 'A' reactor protection system (RPS) (\*JE\*) bus from the alternate to the normal power supply (\*JX\*). It had been previously transferred to the alternate supply in order to perform maintenance activities associated with the planned midcycle outage. This transfer of power supplies is normally accomplished by means of a break-before-make transfer switch (\*JS\*) so that the bus momentarily loses power during the transfer.

In addition to supplying the reactor protection system, the RPS bus supplies power to the nuclear steam supply shutoff system (NSSSS) (\*JI\*). Also, upon loss of power to the NSSSS logic, numerous motor operated isolation valves receive isolation signals to cause them to stroke to the closed position. In order to prevent this from happening, the power supply breakers (\*52\*) for the individual isolation valves were opened in accordance with Operations Procedure SOP-0079. Once the power transfer was complete, the isolation signal was reset by depressing the isolation reset pushbuttons. Operations then began reclosing the breakers to the individual motor operated valves. Upon reclosing the breaker for the outboard reactor water cleanup system (RWCU) suction isolation valve (G33\*MOVF004), the valve immediately began to stroke closed. Closure of this valve resulted in a low flow condition to the reactor water cleanup pumps causing them to trip per design.

The low flow condition caused by the valve closure and subsequent pump trip should have resulted in closure of the filter/demineralizer (F/D) isolation valves and auto start of the F/D hold pump. However, the 'B' F/D isolation valves did not close properly due to a problem with the programmable controller which had resulted in the auto isolation feature being manually over-ridden. The failure of the 'B' F/D to isolate is not indicated in the control room.

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST, 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

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TEXT (if more space is required, use additional NRC Form 306A's) (17)

In order to return the system to service, Operations once again depressed the isolation reset pushbuttons and reopened G33\*MOV004. Operations then restarted the 'A' reactor water cleanup pump. Since the 'B' F/D isolation valves had not closed, full flow was immediately placed through the 'B' F/D and it's associated flow control valve (\*FCV\*). This flow was beyond the range for which the F/D flow controller is tuned and resulted in the control system becoming oscillatory. After 45 seconds, per design, these oscillations resulted in a differential flow isolation of the RWCU system.

Based on data from the emergency response information system (ERIS) (\*IQ\*) computer, it was determined that the portion of the isolation logic which causes closure of the G33\*MOV004 isolation valve (relay B21H\*K154) was not reset prior to reclosing the power supply breaker to the valve. Relay B21H\*K154 (\*RLY\*) is not powered directly from RPS power but rather is controlled by a contact from relay B21H\*K183 which is powered from the RPS 'A' bus. Therefore, relay B21H\*K183 must also have been deenergized by the bus transfer. A review of fourteen relays powered from the RPS 'A' bus which have inputs to the ERIS computer determined that only two of these relays lost power during the bus transfer. The other relay which was confirmed to have lost power based on ERIS data was C71A\*K14A which causes a half-scam signal on the RPS 'A' logic. It must therefore be concluded that the speed with which the power transfer takes place is so rapid that certain relays may drop out while others are able to "ride through" the transfer without losing power.

The operator involved stated that prior to closing the breaker restoring power to the G33\*MOV004 valve, he depressed the isolation reset pushbuttons. However, since none of the other relays which cause isolation signals could be verified to have lost power from a review of ERIS data, it cannot be verified at what point this occurred and what portions of the reset logic did or did not operate properly. No indication is available to the operator to allow him to determine that all portions of the isolation logic were successfully reset when the reset pushbuttons are depressed following an isolation.

**ROOT CAUSE AND CORRECTIVE ACTION**

The root cause of this event is indeterminate. In an attempt to determine if a problem exists with any of the relays or contacts in the reset logic for the G33\*MOV004 isolation circuit, Maintenance Work Order (MWO) #140857 was written to cycle this portion of the circuit several times to try to repeat the failure to reset which occurred previously. Each time, the circuit operated properly. This portion of the isolation circuit is tested via Surveillance Test Procedure (STP) 601-0201, "RWCU SLC CHANNEL A,B ISOLATION ACTUATION" on an alternating divisional basis such that each division is tested every other month. Should a problem reoccur with the components in this circuit, it would be detected by means of this STP and corrected.

Additionally, Modification Request (MR) 87-0576 will install indicating lights on the operator panel adjacent to the reset pushbuttons that will indicate if an isolation signal is present to a portion of the NSSSS logic. When this modification is complete, these lights and an associated annunciator will indicate when the B21H\*K183 relay, as well as other relays, have dropped out. This enhancement will

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 900 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  RIVER BEND STATION	DOCKET NUMBER (2)  0 5 0 0 0 4 5 8 9 1	LER NUMBER (6)			PAGE (3)	
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		0 1 8	0 1	0 1	0 4	OF 0 4

TEXT (If more space is required, use additional NRC Form 356A's) (17)

allow the operator to verify that it has been re-energized by the reset pushbuttons. This will increase the likelihood of detecting this or other similar conditions. Until installed, (during performance of OSP-0012, "Daily Log Report") Operations personnel will continue to verify that the isolation status lights on control room back panels are illuminated.

Although it is not considered likely, a possibility does exist that the operator did not depress the reset pushbuttons hard enough or long enough to ensure all of the isolation relays had time to reset. Procedural enhancements to operating procedures were assessed to determine methods or guidance to operators to better assure that a reset occurs prior to energizing isolation components. This assessment resulted in a change to AOP-0003, "Automatic Isolation."

In reviewing earlier LER submittals, other RWCU isolation were noted to have occurred which were caused primarily during the performance of surveillance test procedures. None were noted to have occurred during the transfer of the RPS bus and/or when a relay failed to reset.

**SAFETY ASSESSMENT**

Although the cause of the isolation of the G33\*MOV004 valve cannot be determined, the closure of the valve placed the system in a more conservative condition. The second isolation due to a differential flow signal was proper operation of the system. Again, the isolation placed the system in a more conservative condition. Therefore, these events did not adversely affect the health and safety of the public.

NOTE: Energy Industry Identification Codes are identified in the text as (\*XX\*).