

LICENSEE EVENT REPORT (LER)

Facility Name (1) Byron, Unit 1 Docket Number (2) 0 5 0 0 0 4 5 4 Page (3) 1 of 0 4

Title (4) REACTOR TRIP DUE TO DC GROUNDS WHICH CAUSED A MAIN STEAM ISOLATION VALVE CLOSURE

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 Names	Docket Number(s)
0 1	2 9	8 6	8 6	0 0 3	0 0	0 2	2 1	8 6	NONE	0 5 0 0 0 1 1

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 8	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
		<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
		<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)
		<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
		<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
		<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name Marseyne Snow, Assistant Compliance Supervisor, Ext. 2679 TELEPHONE NUMBER 8 1 5 2 3 4 - 5 4 4 1

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
B	V F	C L	W 1 2 0	Y					
X	S B	3 3	N 0 0 7	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE) NO Expected Submission Date (15) _____

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

On January 29, 1986 at 0006 a reactor trip and Auxiliary Feedwater actuation occurred. The trip was caused by grounded conditions existing on the positive and negative poles of the 125V DC bus. The grounded circuit energized a fast close solenoid on the 1A Main Steam Isolation Valve (MSIV). The MSIV closed, a feedwater flow/steam flow mismatch resulted, and the trip on Steam Generator low low level resulted.

The reactor trip was caused by the grounds present on the positive and negative poles of the 125VDC battery bus. The ground on the negative bus was caused by degradation of a gasket for a limit switch on the 1A MSIV. The degradation resulted from exposure to Fyrquel fluid used to open and close the hydraulically operated valve. The ground on the positive bus was caused by the shorting of a Closing Spring Relay (SR) on the breaker controlling the OE Auxiliary Building Charcoal Booster Fan. The SR coil shorted due to burned relay contacts on the relay used in the closing circuit.

Recurrence of MSIV grounds will be prevented through reservoir modifications and updates to filling procedures. The relays used in the closing circuits for the Auxiliary Building Charcoal Booster Fans are being investigated to determine if a different type is required. The station will make any modifications following the review.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [xx]

A. PLANT CONDITIONS PRIOR TO EVENT:

MODE 1 - Power Operation Rx Power 98% RCS [AB] Temperature/Pressure Normal Operating

B. DESCRIPTION OF EVENT:

On January 28, 1986 a ground was present on the negative pole of the 125 VDC battery bus [EJ] through a fast close solenoid valve on the 1A Main Steam [SB] Isolation Valve (MSIV) to the casing of a limit switch on the 1A MSIV (see figure 1). At the time the grounded condition did not inhibit the operation of any equipment, and a solution to the problem was under investigation.

At 0000 on January 29, 1986 the OE Auxiliary Building Charcoal Booster Fan [VF] failed to start during a surveillance test. A second grounded condition developed on the positive pole of the 125 VDC battery bus due to a Closing Spring Release Coil (SR) on the Westinghouse DS 206 circuit breaker for the booster fan. The second grounded condition completed a circuit from the positive to the negative poles of the 125 VDC battery bus (see figure 1).

At 0006 on January 29, 1986 the standby fast close solenoid on the 1A MSIV energized and closed the MSIV due to the ground loop present on the 125 VDC battery bus. This isolated steam flow from the 1A Steam Generator (S/G) and caused a steam flow/feedwater flow mismatch. The feedwater flow decreased to a minimum and pressure in the 1A S/G increased. S/G level shrink caused the water level to decrease to below the Low Level Reactor Trip Setpoint and a Reactor Trip and Auxiliary Feedwater [BA] actuation occurred. The licensed operators in the control room carried out Byron Emergency Procedure, 1BEP-0, "Reactor Trip or Safety Injection Unit 1".

The reactor trip was reset and Auxiliary Feedwater was secured. The plant was stable in mode 3, Hot Standby, at 0023 on January 29, 1986.

Following the replacement of the limit switch on the 1A MSIV and the SR coil on the breaker for the OE Auxiliary Building Charcoal Booster Fan the unit was brought back on line.

The SR coil on the breaker was replaced and the breaker was bench tested. Following the breaker installation the OE Charcoal Booster Fan was successfully started. However, on January 31, 1986 the fan failed to start during its bimonthly surveillance. A similar problem existed on the OD Auxiliary Building Charcoal Booster Fan in that it auto-started for no apparent reason. On February 4, 1986 the relay contacts for the Westinghouse AR-3 relays controlling the fan starting circuits were inspected and found to be burned. The OE Booster Fan would not start as the contacts were fused together and the voltage drop through the SR coil was too small to release the closing spring. The OD Booster Fan contacts were close enough together that any movement of the relay cabinet caused them to close and start the fan.

The station submitted a Possible 10CFR Part 21 notification to the Station Nuclear Engineering Department for evaluation of the relay contacts' suitability for service in this application.

This event is required to be reported by 10CFR50.73.a.2.1v.

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C. CAUSE OF EVENT:

The cause of the reactor trip was the presence of grounds on the positive and negative nodes of the Division 12 125 VDC bus. The ground on the negative pole was caused by the degradation of the gasket on an MSIV limit switch. Fyrquel fluid, used to open and close the Main Steam Isolation Valves, had a tendency to leak when the valves were fast closed. The fluid, a phosphate ester, degraded the gasket seal on the limit switch as well as the flexible rubber coated wire tubing. The limit switch was no longer insulated and, as a result, the ground developed.

The ground on the OE Auxiliary Building Charcoal Booster fan is believed to have been caused by the contacts of the Westinghouse AR-3 relay fusing together and overheating the spring release coil. The overheating of the SR coil resulted in insulation breakdown and electrical grounding. The suitability of this type of relay for this application is under investigation.

D. SAFETY ANALYSIS:

The reactor trip did not endanger the health and safety of the plant or public as that event placed the plant in a safer configuration (Hot Standby).

The failed ventilation fans placed the plant in a less conservative configuration, however there were redundant 100% capacity fans in each of the affected plenums that were operable.

E. CORRECTIVE ACTIONS:

The grounded limit switch on the MSIV was replaced along with the flexible rubber coated wire tubing. Component degradation will be limited in the future due to modifications to the Fyrquel fluid reservoir that have been completed. In addition, changes were made in the maintenance procedure for filling the reservoir which will prevent overflow. During the next scheduled outage of sufficient duration the limit switches, sealtight, and associated wiring on the MSIV's will be inspected with repairs and replacements made as necessary. Action Item Record (AIR) 6-86-034 tracks completion of corrective action.

The ground on the Charcoal Booster Fan was removed after the SR coil on the circuit breaker was replaced. Different contacts on the AR relay are currently being used pending a resolution from the Station Nuclear Engineering Department for long term corrective action (AIR 6-86-035 tracks completion).

F. PREVIOUS OCCURRENCES:

LER NUMBER	TITLE
NONE	

G. COMPONENT FAILURE DATA:

MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MFG PART NUMBER
Westinghouse	Electrical Relay	AR-3	--
Namco	Limit Switch	EA18031302	4980H22113

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [xx]

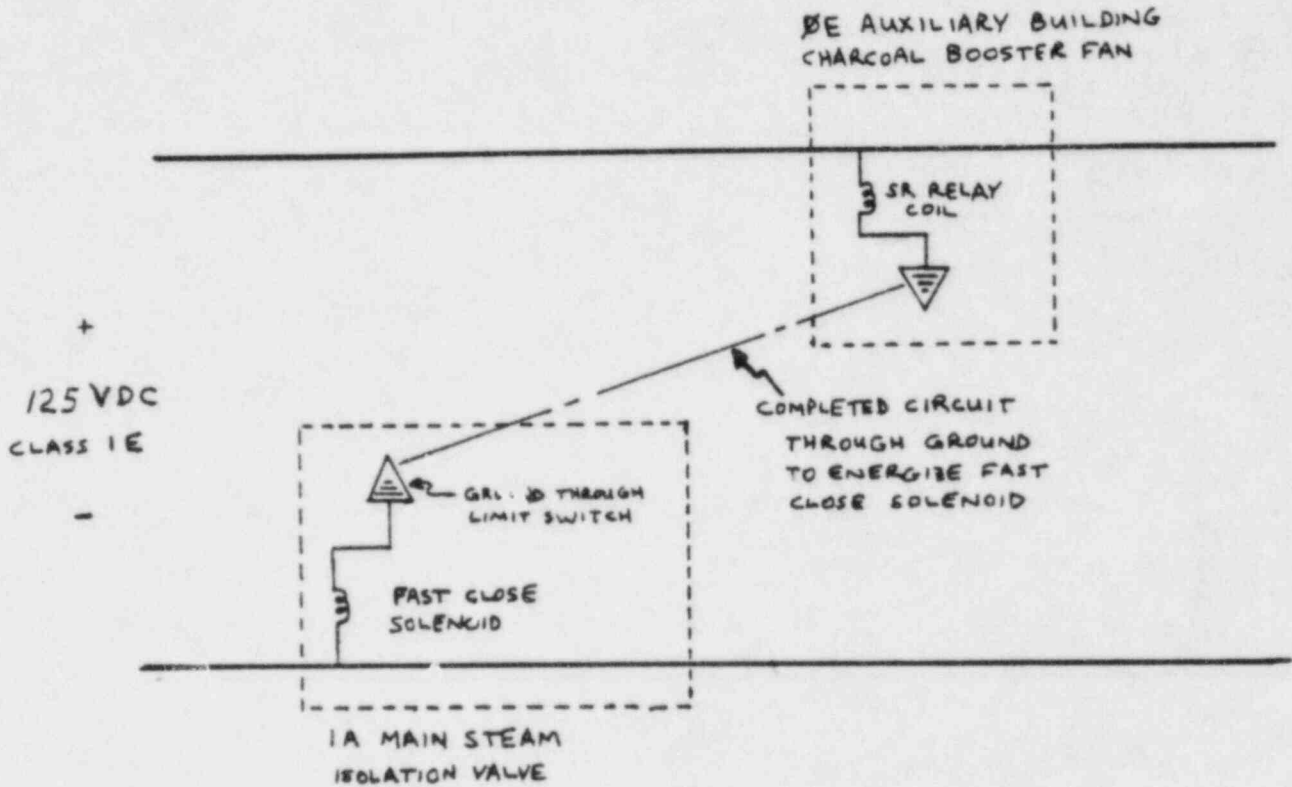


FIGURE 1 - SIMPLIFIED 125 VDC (CLASS 1E) DISTRIBUTION



Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

February 21, 1986

LTR: BYRON 86-0162

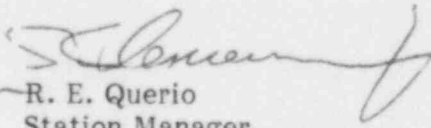
U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv) which requires a 30 day written report.

This report is number 86-003-00; Docket No. 50-454.

Very truly yours,


for R. E. Querio
Station Manager
Byron Nuclear Power Station

REQ/RP/bf

Enclosure: Licensee Event Report No. 86-003-00

cc: J. G. Keppler, NRC Region III Administrator
J. Hinds, NRC Resident Inspector
INPO Record Center
CECO Distribution List

#3/017

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