

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 2
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Title (4) REACTOR TRIP DUE TO INSTRUMENT POWER INVERTER FAILURE

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 5	2 5	8 5	8 5	0 5 3	0 0		0 6	2 1	8 5		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 1 3		20.402(b)		20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)		73.71(b)			
		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)			
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		Other (Specify			
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		in Abstract			
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		below and in			
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		Text)			

LICENSEE CONTACT FOR THIS LER (12)

Name Doug Kruger, System Test Engineer Ext. 2314	TELEPHONE NUMBER AREA CODE 8 1 5 2 3 4 - 5 4 4 1
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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	
X	E F	X f m r	W 1 2 0	N							

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	Expected Submission Date (15) Month Day Year
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

On 5/25/85 at 1134 CST, a reactor trip occurred due to low-low steam generator water level. The low level occurred when an instrument bus inverter failure in conjunction with a blown fuse in a 7300 switch card caused a partial feedwater isolation. The loss of output from the 7300 switch card de-energized a relay in the water hammer prevention system. The loss of the instrument bus de-energized a second relay (2-of-3 relay logic) which was needed to actuate the water hammer prevention system and subsequent partial feedwater isolation.

The cause for the blown fuse on the 7300 switch card is unknown. The instrument inverter failure was caused by dirt and filings shorting the windings of a transformer in the inverter. The switch card fuse was replaced and the damaged transformer inverter was also replaced.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT

On 5/25/85, at 1134 CST, a reactor trip occurred from 13% power, due to low-low steam generator water level which was caused by a feedwater isolation from the water hammer prevention system.

On 5/25/85 at approximately 0430, the Instrument Maintenance (IM) Department was conducting a monthly functional check surveillance of steam pressure comparison protection loop 516 (BIS 3.2.1-013). An unexpected feedwater isolation signal was received on Train A when the 516 loop of the 7300 system was placed in test for the surveillance. The IM personnel exited the surveillance and returned the 516 loop to service quickly enough that the transient caused by the momentary feedwater isolation did not cause a reactor trip. IM personnel investigated the momentary feedwater isolation and discovered that it was caused by de-energizing 2-of-3 relays needed to actuate the water hammer prevention system. One relay in the logic train was de-energized when the 516 loop was placed in test and the second relay was de-energized because an output fuse on a Westinghouse 7300 NAS switch card that normally energizes that relay, was blown. The fuse on the NAS card could not be replaced immediately because the impact on other systems of removing the card required evaluation. Therefore one of three relays remained de-energized.

At 1134 CST the 114 Instrument Power (IP) bus was de-energized due to a failure of the Westinghouse 114. IP inverter (7.5KVA, 1 phase inverter). This de-energized another relay in the water hammer system which, along with the relay already de-energized by the blown fuse on the NAS card, initiated another feedwater isolation on Train A. This caused the reactor trip from low-low steam generator water level.

Following the reactor trip, the Train B Auxiliary Feedwater (AF) pump and the B Train Feedwater (FW) isolation did not actuate automatically on low-low steam generator level because of the loss of voltage from the 114 IP bus to the Train B ESF relays. Train A actuated normally.

During the unit trip, a voltage transient caused by auto-bus transfers, actuated a Process Radiation (PR) monitor interlock which, in turn, initiated the ESF line-up of the Main Control Room Ventilation System.

It appears that the 114 IP inverter failure was caused by metal filings and dirt shorting out the windings of the inverter's output transformer. The debris was accumulated in the transformer during Unit 1 construction. The 114 IP inverter output transformer was replaced on 5/25/85.

The cause for the blown fuse on the NAS card is unknown. The fuse was replaced on 5/25/85. The actuation of the PR monitor interlock due to a voltage transient has occurred in the past and has been previously reported. (Reference LER No.'s 85-007-01 and 85-030-00 for Byron, Unit 1). A modification is in progress which will de-sensitize the PR monitors to voltage perturbations. The IM Department is changing applicable procedures to verify the status of relays powered by NAS cards in coincident logic loops prior to conducting surveillances on similar logic loops.

There was no impact on plant or public safety because all A train equipment was available and functioned to shutdown the Unit. The loss of the 114 IP bus did not affect the ability to manually initiate the B train AF pump or FW isolation. Automatic actuation capability for Train B was re-established when the 114 IP inverter was restored at approximately 1300 CST on 5/25/85.

Previous similar occurrences: None



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

June 21, 1985

LTR: BYRON 85-0931

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 85-053-00; Docket No. 50-454.

Very truly yours,

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

REQ/gt

Enclosure: Licensee Event Report No. 85-053-00

cc: J. G. Keppler, NRC Region III Administrator
J. Hinds, NRC Resident Inspector
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