

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 3

Title (4) BORON DILUTION-PROTECTION ACTUATION

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)
1 2	1 5	8 4	8 4	0 3 1 1	0 1	1 0	1 6	8 6	NONE	0 5 0 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)								
POWER LEVEL (10)	0 0 0	<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 F. Hornbeak, Technical Staff Supervisor, Ext. 2243 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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	I G	C H A	W 1 2 0	N					

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 12/15/84, 12/17/84, and 12/19/84, the Boron Dilution Protection System (BDPS) [IG] actuated. Each actuation resulted in a charging pump suction switchover from the Volume Control Tank to the Refueling Water Storage Tank. All three actuations were determined to have been caused by electrical noise spikes on the Nuclear Power Source Range channels. After determination of the origin of the BDPS actuations, the operator realigned the charging pump suction to its normal line-up. Numerous corrective actions were taken to reduce the electrical noise spiking.

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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 5 - Cold Shutdown Rx Power 0 RCS [AB] Temperature/Pressure ≤ 200°F/De-pressurized

B. DESCRIPTION OF EVENT:

On 12/15/84 at 2025, 12/17/84 at 1704 and 12/19/84 at 0813 with the unit in Cold Shutdown and RCS boron concentration greater than 2000 parts per million (ppm) the Boron Dilution Protection System (BDPS) [IG] actuated causing a Chemical and Volume Control charging pump (CVCS) [CB] suction switchover from the Chemical Volume Control Tank to the Refueling Water Storage Tank [BQ]. The operators identified the cause as electrical noise spikes on the Source Range channels [IG] and realigned the charging pump suction to its normal line-up. Within ten minutes the BDPS alarm cleared.

C. CAUSE OF EVENT:

Each actuation was the result of noise spiking on the Nuclear Power Source Range channels which created a false flux doubling signal.

D. SAFETY ANALYSIS:

Plant and public safety were not effected. BDPS is a conservative safety actuation. The system functioned correctly to a spurious actuation signal. At the time of all three actuations, the unit was in mode 5 with RCS boron concentration greater than 2000 ppm. Shutdown margin was in excess of Technical Specification requirements and no adverse safety consequence resulted from the BDPS actuation.

E. CORRECTIVE ACTIONS:

Byron Station went through an extensive Source Range Channel noise reduction program in late 1984 and early 1985 during the start-up program. The Commonwealth Edison System Operational Analysis Department issued Report EI-22-85 on 5/15/85 which summarized the investigation of noise sources and gave several recommendations and corrective actions which were implemented with success (listed below). The frequency of noise spikes has been significantly reduced and has not caused any BDPS actuations for over 20 months. Consequently, Byron Station does not plan to take any further actions.

Summary of Corrective Actions

1. The NSSS Vendor identified humidity and dirt in triaxial cable connectors as a major cause of source range noise. As a result, cable connectors were disassembled and cleaned. In addition, all Nuclear Instrumentation System (NIS) drawers were thoroughly cleaned.
2. Heavier gauge grounding wire was installed on NIS cabinets; spare NIS cables running parallel to the normal cables were grounded at one end to reduce inductive coupling and source range preamplifiers were grounded in accordance with vendor recommendations.
3. Temporary triaxial cables were used in troubleshooting and were routed along various paths away from known noise sources. When a low-noise path was identified permanent conduit and cables were installed.

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

Summary of Corrective Actions

4. Preamplifiers for source range channels were moved closer to the containment penetrations to decrease the distance between the detectors and preamplifiers.
5. Other cables that were potential sources of noise were identified and separated from the source range cables.
6. Vapor-type lighting (such as high intensity discharge lighting) was found to cause noise spiking under some conditions and vapor lights in the vicinity of the preamplifiers were replaced with incandescent bulbs.
7. The doors on the Model 7300 process racks are equipped with switches to alarm when the cabinets are opened. Operation of the switches was found to cause spikes. Noise suppression modules were installed across the 120-vac supply to the auxiliary relays picked up by these switches.
8. The fifty-pound pull test on triaxial connectors was eliminated. This avoids damage to the cable shield. The test is now used only to verify that assembly personnel can install connectors correctly.
9. The detector cables in the detector wells for source, intermediate, and power range channels were protectively taped at the vendor's recommendation. Damaged outer shields had been observed during troubleshooting).
10. Triaxial Connectors in the NIS rack were made more rigid by applying heat shrink materials. This improvement should eliminate connector problems caused by drawer movement and calibration activities.

F. PREVIOUS OCCURRENCES:

<u>LER NUMBER</u>	<u>TITLE</u>
84-019-00	Boron Dilution Protection Actuation

G. COMPONENT FAILURE DATA:

<u>MANUFACTURER</u>	<u>NOMENCLATURE</u>	<u>MODEL NUMBER</u>	<u>MFG PART NUMBER</u>
Not Applicable			



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

October 16, 1986

LTR: BYRON 86-1272

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 10555

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you as a Supplemental Report to LER 84-031-00.

This report number is 84-031-01, Docket No. 50-454.

Very truly yours,

R. E. Querio
Station Manager
Byron Nuclear Power Station

REQ/bf

Enclosure: Licensee Event Report No. 84-031-01

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

#3/039

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