

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

December 21, 1989

Ltr: BYRON 89-1248

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 as a Supplemental Report.

This report is number 89-003; Docket No. 50-4545.

Sincerely,

R. Pleniewicz Station Manage Byron Nuclear Power Station

RP/bb (0484R/0059R)

Enclosure: Licensee Event Report No. 89-003

cc: A. Bert Davis, NRC Region III Administrator W. Kropp, NRC Senior Resident Inspector INPO Record Center CECo Distribution List

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On February 27, 1989, with Unit 2 in Cold Shutdown (Mode 5), area radiation monitor 2RT-AR012 failed its automatic checksource test. The checksource test failure caused the automatic closure of the mini-flow purge exhaust isolation valve (2VQ005B) and actuated a containment ventilation isolation alarm in the Main Control Room. The monitor was declared inoperable after it failed several manual checksource tests.

Technical Specification 3.3.3.1 requires that monitors 2RT-AR011 and 2RT-AR012 be operable at all times. With one or more monitors inoperable, the Limiting Condition for Operation Action Requirement (LCOAR) requires that the containment purge valves be closed. This was partially achieved by the automatic actuation of Engineered Safety Feature valve 2VQ005B, which closed as designed upon the failure of the checksource test. The remaining purge isolation valves were closed by the Nuclear Station Operators (NSO) (licensed reactor operators) after the detector was declared inoperable.

The immediate cause of the failed checksource test was a faulty detector. The detector was replaced and the monitor was returned to service on February 28, 1989.

There have been no previous ESF actuations caused by similar radiation detector failures.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Form Rev 2.0		
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# A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 02/27/89 / 0820

Unit 2 MODE 5 - Cold Shutdown Rx Power 0% RCS [AB] Temperature/Pressure 190°F/ 375 PSIG

# B. DESCRIPTION OF EVENT:

At 0820 on February 7, 1989, with Unit 2 in Mode 5, area radiation monitor 2RT-AR012 [IL] failed its automatic checksource test. The checksource test failure caused the automatic closure of the mini-flow purge exhaust isolation valve (2VQ005B) [VA] and actuated a containment ventilation isolation alarm in the Main Control Room. The detector also failed several manual checksource tests. The monitor was declared inoperable and the appropriate Limiting Condition for Operation Action Requirement (LCOAR) was entered.

Technical Specification 3.3.3.1 requires that monitors 2RT-AR011 and 2RT-AR012 be operable at all times. With one or more monitors inoperable, the LCOAR requires that the containment purge valves be closed. At the time of the incident, all Unit 2 containment purge valves were closed except for 2VQ005A, 2VQ005B, and 2VQ005C. Upon failure, monitor 2RT-AR012 closes all B-Train purge valves, including 2VQ005B. Monitor 2RT-AR011 controls the A-Train valves including 2VQ005A and 2VQ005C. The actuation of Engineered Safety Feature (ESF) valve 2VQ005B occurred as designed upon the failure of the checksource test for monitor 2RT-AR012. The two remaining purge isolation valves were closed by the Nuclear Station Operators (NSOs) (Licensed Reactor Operators) after the detector was declared inoperable.

Attempts to troubleshoot the detector were unsuccessful. The detector was replaced, tested and returned to service on February 28, 1989. No other inoperable plant systems or components contributed to this event. The plant was maintained in a stable condition throughout this event. All operator actions taken were correct.

This event is reportable under 10CFR50.73(a)(2)(iv) due to the automatic actuation of an Engineered Safety Feature.

## C. CAUSE OF EVENT:

The immediate cause of this event was the failure of a General Atomics Model RD-10B detector. During the checksource test, the detector was exposed to the source, but failed to register an appropriate count rate. This detector had been installed approximately three weeks prior to failure. The detector replaced a similar detector that was operating properly but had reached the end of its qualified life. The replacement detector was tested following installation and was found to be in calibration. The detector also passed all of its daily automatic checksource tests prior to its failure. The detector was sent to General Atomics for a root cause failure analysis. They performed a three point calibration and determined the detector was operating correctly. The detector was returned to the station. However, the Station did not feel the detector was reliable, as the failure may be intermittent, so the detector was disposed of. The radiation monitor has functioned properly since the detector was replaced.

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## D. SAFETY AMALYSIS:

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There was no effect on plant or public safety. The automatic closing of valve 2VQ005B is an ESF actuation which establishes a safer plant condition by isolating the containment building ventilation purge flowpath. The containment ventilation isolation was not required since no radioactive contaminants were present during this event. The redundant area radiation monitor (2RT-AR011) was operable throughout this event and did not detect any increase in radioactivity. The safety consequences would have been the same had this event occurred under a more severe set of initial conditions.

#### E. CORRECTIVE ACTIONS:

The detector was replaced by the Instrument Maintenance Department under Work Request B65279. The monitor was tested and returned to service on February 26, 1989. No further corrective actions are planned at this time.

#### 1. PREVIOUS EVENTS:

There have been a number of checksource failures with General Atomics Model RD-10B detectors. However, these events involved mechanical failures of the mechanisms used to expose the source to the detector. Other detector failures resulting in ESF actuations involved invalid radiation spikes. This is the first occurrence of a check source test failing due to the detector failing to register counts.

## G. COMPONENT FAILURE DATA:

MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MEG PART NUMBER
General Atomics	Detector Ass <b>em</b> bly	RD-10B	0281-0760-002