



Commonwealth Edison  
1400 Opus Place  
Downers Grove, Illinois 60515

April 8, 1994

Mr. William Russell, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington D.C. 20555

Attn: Document Control Desk

Subject: Commonwealth Edison Company  
10 CFR Part 21 Final Report (File 94-02)  
Premature Failure of Power Supplies used in Westinghouse Eagle-21

Dear Mr. Russell:

The purpose of this letter is to notify the NRC Staff of Commonwealth Edison Company (CECo) concerns regarding the failures of power supplies used in the Westinghouse Eagle-21 Plant Protection System. The power supplies provide DC power to various internal Eagle-21 components. Failure of the power supplies was characterized by a complete loss of voltage to the associated loads. The loss of DC power to the system renders the system incapable of performing its design safety functions.

A root cause investigation concluded that the failure of a capacitor caused the loss of voltage to the associated loads. Defective capacitors were supplied by AVX to ASTEC America over a specific time period. The corrective action of refurbishing the effected power supplies with new capacitors has been completed.

Provided as an attachment to this letter is CECo's notification in accordance with the requirements of 10 CFR Part 21, Section 21(c)(3).

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Mr. W. T. Russell

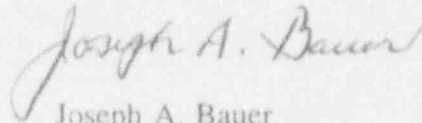
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April 8, 1994

As stated in the attached report, corrective actions have been completed for all subject Westinghouse Eagle-21 Plant Protection System power supplies installed at CECo's Zion Station. No other CECo stations utilize this component.

If there are any questions regarding this notification, please direct them to this office.

Respectfully,

A handwritten signature in cursive script that reads "Joseph A. Bauer".

Joseph A. Bauer  
Nuclear Licensing Administrator

Attachment: 10 CFR Part 21 Final Report

cc: J. Martin, Regional Administrator - RIII  
J.E. Dyer, Directorate III-2 Director, NRR

### **10 CFR Part 21 NOTIFICATION**

#### **Premature Failure of Power Supplies used in Westinghouse Eagle-21 Part-21 file #9402**

This notification is submitted in accordance with the requirements of 10 CFR Part 21, Section 21(c)(3).

#### **Identification of Facility and Component**

The defective component was identified only at Commonwealth Edison's Zion Station. The affected components are Westinghouse Part # 2D33574GO7 and 2D33574GO9 (Power Supplies) and are used in the Westinghouse Eagle-21 Plant Protection System.

#### **Component Manufacturer**

The Power Supplies (RS 300 and RT 300 Series) are manufactured by ASTEC America and are used by Westinghouse Electric Corporation in the Eagle-21 Plant Protection System.

#### **Nature of Defect**

The power supplies provide DC power to various internal Eagle-21 components. The failures of the power supplies were characterized by a complete loss of voltage to the associated loads.

A root cause investigation concluded that the failure of a capacitor at locations C2 and C7 caused the loss of voltage to the associated loads. Defective capacitors were supplied by AVX to ASTEC America over a specific time period. The corrective action taken was to refurbish the effected power supplies with new capacitors.

#### **Safety Significance**

Each reactor at Zion Station uses 10 racks of Eagle-21 to acquire and process reactor protection system process parameters. The system produces output signals which drive control room indicators, reactor protection circuitry, engineered safety features logics and analog signals used by plant control systems.

Two power supply assemblies are used in each of the 10 racks of Eagle-21. One provides DC power to the Tester Subsystem and its auxiliaries and the other provides DC power to the Loop Processor and its auxiliaries. A loss of DC power to the Tester Subsystem, while not desirable, is not considered safety significant since this

**Safety Significance (cont'd)**

subsystem only provides diagnostic, testing and annunciation functions. If this subsystem fails, the rack will still continue to perform its design safety function.

The loss of DC power to the Loop Processor subsystem would cause the rack to lose the capability to perform its design safety functions. All of the channels in the affected rack will fail to the preferred trip state, usually the de-energized state, however, since the containment spray function is an energize to actuate function, it does not fail to the "tripped" state. Simultaneous power supply failures could cause containment spray not to be available for automatic actuation. In addition, depending on the rack affected, some Regulatory Guide 1.97 required control room indications would not be available.

**Discovery Date**

February 8, 1994

**Corrective Action**

All power supplies used at Zion were removed and returned to Westinghouse for refurbishment. The capacitors were replaced, returned to Zion, tested and returned to service.

**Number and Location of All Defective Components**

Each reactor at Zion Station uses 10 racks of Eagle-21. In addition, there is one rack which is used by the training department. Two power supply assemblies are used in each rack of Eagle-21. Power supplies that were manufactured in 1991 during weeks 34 through 47 (date codes 9134 through 9147) are subject to these premature failures.

**Contacts**

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