

50-352

PHILADELPHIA ELECTRIC COMPANY

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JUN 22 1984

JOSEPH W. GALLAGHER
MANAGER
ENGINEERING AND RESEARCH

Mr. Thomas E. Murley, Director
Office of Inspection and Enforcement - Region I
United States Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Subject: Limerick Generating Station, Unit 1
Final Significant Deficiency Report No. 142
Damaged Shafts on IIT Actuators

Reference: Telecon: J. P. Evans/PECO to Walt Baunack/NRC,
Dated 05/25/84

File: QUAL 2-10-2 (SDR No. 142)

Dear Mr. Murley:

In compliance with 10CFR50.55e, enclosed is the final report on the subject deficiency. Your office was informed of this matter on May 25, 1984 by the referenced telecon.

Sincerely,

JW Gallagher

WSS/drd840618

Attachment

Copy to: Director of Inspection and Enforcement
United States Nuclear Regulatory Commission
Washington, DC 20555

S. Chaudhary, Resident NRC Inspector (Limerick)

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Significant Deficiency Report - SDR No. 142
Damaged Shafts on ITT General Controls Actuators
Limerick Generating Station
NRC Construction Permit No. 50-352 and 50-353

Description of Deficiency

In April, 1984 ITT General Controls, Series NH90 electro-hydraulic actuators were returned to the vendor for routine actuator seal replacement. Sixty-one of the actuators are used for actuating safety-related HVAC dampers manufactured by American Warming and Ventilation Co. Eight of the actuators are used for controlling the blade pitch on safety-related vaneaxial fans manufactured by Joy Fan Co.

During the course of disassembly and inspection it was found that six of the actuator shafts exhibited scoring due to previous operation. It was determined that this scoring was the result of excessive lateral movement of the actuator shaft during operation, due to inadequate design provisions to limit such movement.

Corrective Action

All defective actuator shafts were replaced during the seal replacement program and returned to the jobsite. Manufacturer's representatives from American Warming and Ventilating Company, Joy Fan Company and ITT General Controls visited the jobsite to inspect the actuator attachment to actuated device. As a result of this inspection it was determined that design modifications were required to provide improved actuator shaft support that would limit lateral shaft movement and the resultant scoring of shafts.

The design modifications were provided by Joy Fan Company and American Warming and Ventilation Company and have been completed for all Unit 1 and Common equipment. Unit 2 components have

had non-compliance reports issued against them, documenting that they require design modifications prior to use.

Safety Implications

The design of the ITT General Controls actuator is such that the actuator shaft can tolerate only limited amounts of lateral movement. Excessive lateral movement can cause shaft scoring and excessive hydraulic seal wear, which could eventually result in loss of hydraulic fluid with the dampers and fan blades then going to their fail-closed position.

A common mode failure of this type could result in the inability of safety-related HVAC systems (SGTS, RERS, CREFAs, Control Room HVAC, Control Enclosure HVAC, Diesel Generator HVAC, Spray Pond HVAC) to perform their functions, although it is extremely unlikely that these projected failures would occur abruptly and simultaneously without early and gradual warning.

RBA/aag 2/1