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JOHN S. KEMPER
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March 30, 1984

Mr. Thomas E. Murley, Director
United States Nuclear Regulatory Commission
Office of Inspection and Enforcement, Region 1
631 Park Ave.
King of Prussia, PA 19406

SUBJECT: Significant Deficiency Report #107
Interim Report on Defective Agastat Relays
Limerick Generating Station, Units 1 and 2
NRC Construction Permits Nos. CPPR-106 & 107

REFERENCES: (1) Telecon of November 29, 1983
P. K. Pavlides (PECO) to Walter Baunack (USNRC)
(2) Significant Deficiency Report #107,
Interim Report of December 28, 1983

FILE: Qual 2-10-2 (SDR #107)

Dear Mr. Murley:

The enclosure to this letter is provided as a second interim report concerning defective Agastat GP relays at the Limerick Generating Station (LGS). Previous information was forwarded to the USNRC via the references.

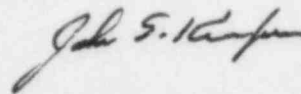
The Agastat GP relays at Limerick were tested and analyzed. The attachment documents the results of this investigation. We are currently evaluating a course of corrective action. We expect to

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notify the Commission of the corrective action to be taken, within 30 days. This information will be submitted in the final report.

Sincerely,



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nel-p03298411100
Attachment

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

S. K. Chaudhary, Resident NRC Inspector (Limerick)

MHH:nel-p
nel-p03298411100

Copy to:	W. C. McDaniel (Bechtel)	J. M. Corcoran
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Limerick Generating Station Units 1 and 2
Significant Deficiency Report #107
Defective Agastat Relays
Second Interim Report

March 29, 1984

1.0 Introduction

This is a second interim report concerning defective Agastat GI relays at the Limerick Generating Station (LGS).

The USNRC was previously notified of this 10CFR 50.55(e) reportable condition in an interim report, dated December 28, 1983.

2.0 Description of Problem

Several Agastat GP relays in the Core Spray, Residual Heat Removal, and Reactor Protection Systems misoperated during pre-operational testing. The normally closed contacts of these relays failed to close when the relay was de-energized. During further testing, it was discovered that the relay contact failure is intermittent. These defective relays were utilized in normally energized applications. This failure has occurred in 40 relays out of several hundred tested. The failed relays were all manufactured prior to August, 1977.

3.0 Analysis of Relay Failure

A number of the defective Agastat GP relays were tested and inspected to determine: (1) the exact cause of relay misoperation; (2) if the relay is defective or improperly adjusted; and (3) if all of the Agastat GP relays at LGS have the potential for this problem.

Our investigation indicates that the failure is limited to normally closed contacts on relays which are normally energized. The failures occur predominantly on relays with 24VDC coils which operate at higher temperatures than the 120VAC and 125VDC coil relays. In many cases, the failed contacts were actually closed but did not provide electrical continuity. We have determined that this condition results from two causes: 1) inadequate spring tension on the movable contact arm, and 2) corrosion build up on the contact surfaces. Cause 1) may be the result of either improper factory adjustment or relaxation of spring tension due to heat. As this problem has become more severe

the longer the relays are energized, we believe the spring tension is relaxing as the relay ages. As for cause 2) corrosion begins naturally on the contact surface. Because the failed relays were in storage for approximately seven years, we believe that the contact surface corrosion has had ample time to develop. In addition, we believe this corrosion is accelerated in the normally energized relays because of the heat generated by the coil. The relay design also contributes to this condition by failing to provide any significant wiping action for the normally closed contacts.

Our investigation to confirm these initial observations is continuing.

4.0 Safety Implications

The defective Agastat GP relays were discovered during pre-operational testing of the RHR, RPS and Core Spray systems at LGS. A defective relay could adversely affect the operation of safety related equipment in these systems and other systems in which Agastat GP relays are provided.

5.0 Corrective Action

We are currently evaluating a course of corrective action. A decision is expected within 30 days. We will notify the Commission of the corrective action to be taken in the final report. Corrective action will be completed and the final report submitted prior to fuel load.