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 50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv 05000388
 AUTH. NAME AUTHOR AFFILIATION
 KEISER, H.W. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 MILLER, C.L. Project Directorate I-2

SUBJECT: Part 21 rept re failure of five remote temp detectors, mfg by Hy-Cal Engineering, used in suppression pool temp monitoring sys. Moisture responsible for erratic resistance readings. All defective detectors replaced & testing frequency increased. R
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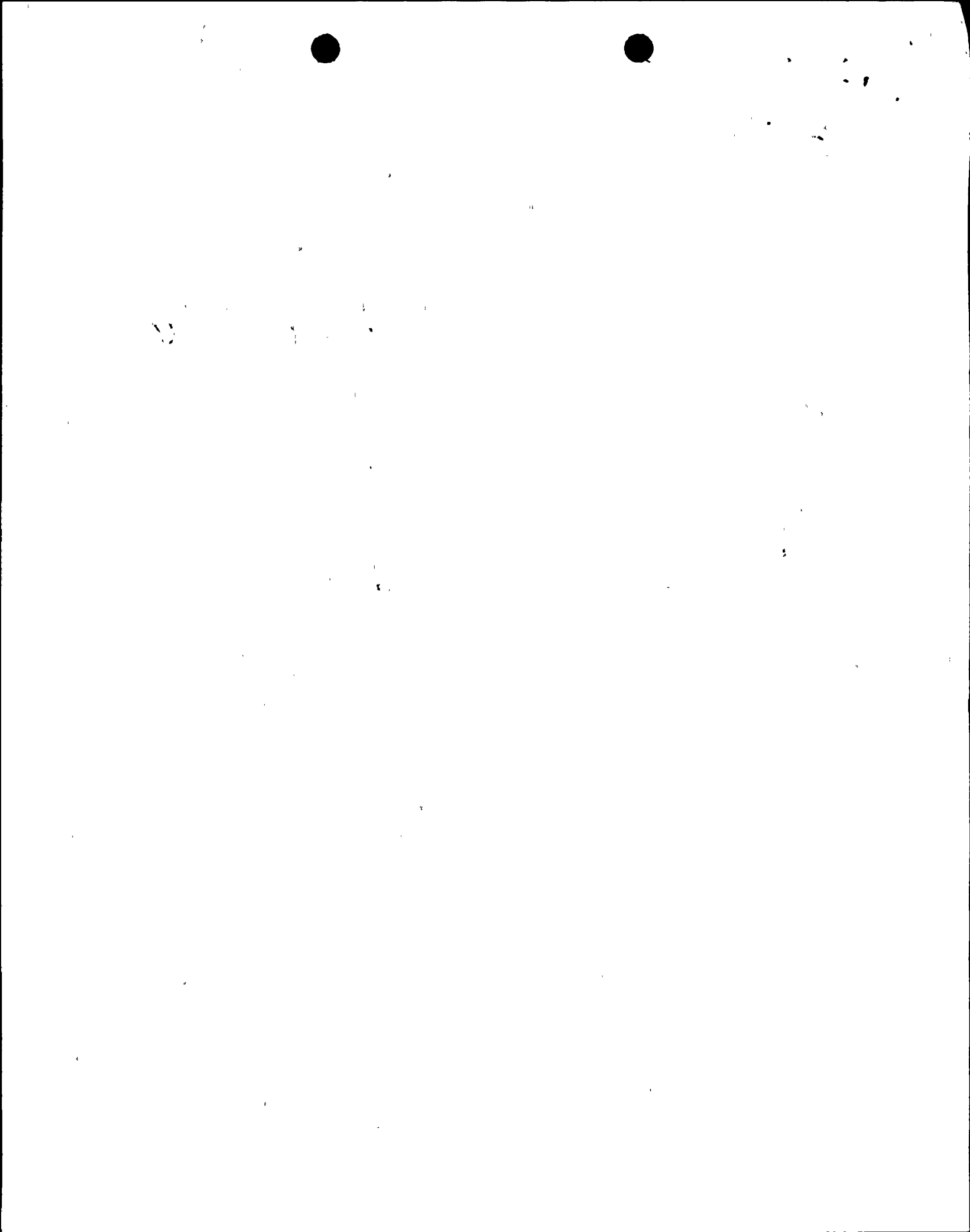
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Pennsylvania Power & Light Company

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Harold W. Keiser
Senior Vice President-Nuclear
215/774-4194

OCT 16 1992

Director of Nuclear Reactor Regulation
Attention: Mr. C. L. Miller, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
10CFR21 REPORT REGARDING FAILURE OF
HY-CAL RTDs
PLA-3859**

FILE R41-2A

Docket Nos. 50-387
and 50-388

References: -PLA-3842, "Failure of Hy-Cal RTDs," H.W. Keiser to C.L. Miller, dated August 26, 1992.

Dear Mr. Miller:

This letter serves to provide our report pursuant to the requirements of 10CFR21 - Reporting of Defects and Noncompliance regarding the failure of 5 remote temperature detectors (RTDs) used in the Susquehanna Steam Electric Station Unit 1 suppression pool temperature monitoring system (SPOTMOS). This issue was previously brought to your attention in the reference above. The issue was confirmed as a detect on September 2, 1992.

Identification of Component and Component Supplier

The components are RTDs manufactured by Hy-Cal Engineering, 9850 Telstar Avenue, El Monte, California 91731-3093. The part number of the RTDs is: RTS-4096-B-A-100-C290-3-12-XI-M3. All the RTDs in question have been traced to a single purchase order supplied by Hy-Cal.

Based on discussions with Hy-Cal, we believe that these RTDs are from a single manufacturing lot. Hy-Cal also contends that PP&L has been the sole purchaser of these particular RTDs.

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Nature of the Defect

Analysis of the failed RTDs indicates defects in manufacturing as the probable cause of failure. A destructive failure analysis performed by Hy-Cal (attached) has verified the original hypothesis that entrained moisture in the sensing units of the RTDs was responsible for the erratic resistance readings in some of the failed RTDs. In other failed RTDs, problems with broken leads at the sensor tip and cut insulation on internal lead crimps also caused erratic and intermittent resistance readings.

Safety Hazard Created

During a design basis loss of coolant accident (LOCA) the suppression pool water acts as a condensing medium for steam, thereby keeping the pressure rise in the containment to a minimum. The suppression pool also provides either the main or alternate source of water for the Core Spray, the High Pressure Coolant Injection (HPCI), the Reactor Core Isolation Cooling (RCIC) and the Residual Heat Removal (RHR) systems. Assurance that the suppression pool can support these various safety-related functions is obtained by operating the pool within the prescribed temperature limits as set forth in Technical Specifications. Therefore, suppression pool water temperature is monitored via SPOTMOS to ensure that the water temperature is maintained within the prescribed limits. The SPOTMOS system relies on correct input from the RTDs to determine the suppression pool temperature and provide this information to operators who will take compensatory actions to cool the pool water, if required. Erratic and/or intermittent RTD reading would clearly present the possibility for operator misinformation regarding suppression pool water temperature and may result in misguided operator action regarding cooling of the pool water. This would clearly leave indeterminate the ability of the suppression pool to carry out any of its safety-related support functions.

Corrective Action Taken

PP&L has replaced all Hy-Cal RTDs in Unit 1 from the suspect lot. Although we believe that there is only one problem lot, we have conservatively chosen to accelerate testing of all inservice RTDs in both Unit 1 and Unit 2 from an 18 month frequency to a 6 month frequency. Unit 2 has 1 Hy-Cal RTD from the failure lot that will be replaced during the ongoing Unit 2 5th refueling and inspection outage.

Please call Mr. J.B. Wesner at (215) 774-7911 with any questions.

Very truly yours,



H.W. Keiser

Attachment: Hy-Cal Engineering Failure Analysis Report

cc: NRC Document Control Desk (original)
NRC Region I
Mr. G. S. Barber, NRC Sr. Resident Inspector
Mr. J. J. Raleigh, NRC Project Manager



September 2, 1992
RMA #20184

Mr. Clayton Price
Pennsylvania Power & Light Co.
Susquehanna Steam Electric Station

Mr. Price,

The analysis on the five units from RMA# 20184 has been completed. The following are the results of the evaluation performed on those five units as received and the DPA results that followed.

RTD PART #	RESISTANCE AS RECEIVED	VDC to GROUND	DPA FINDINGS
TE15754	WITHIN SPEC.	0	a) Sensor was removed from housing. b) Moisture found in sensor tube. c) Sensor dried out and resistance stabilized to correct value.
TE15755	WITHIN SPEC.	0	a) Sensor was removed from housing. b) No defects detected. c) Sensor remained stable. d) Unit did not exhibit any failure before, during or after evaluation.
TE15756	OPEN	0	a) Sensor was removed from housing. b) Broken double lead at glass to platinum wire interface at sensor tip.
TE15758	ERRATIC	0	a) Sensor was removed from housing. b) Moisture found in sensor tube. c) Sensor dried out and resistance did not stabilize to correct value.
TE15766	INTERMITTENT	0	a) Sensor was removed from housing. b) Internal lead crimp had cut the insulation on the three wires causing an intermittent ground to the case. c) Sensor reading remained in spec. after the housing was removed.

If there is any question please contact me at (818)444-4000 (Page).

Respectfully,

Paul Steinhoff
TQM Manager

