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MIDDLE SOUTH
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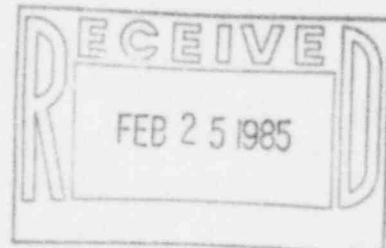
February 21, 1985

W3P85-0338
Q-3-A35.07.37
3-A1.01.04
A4.05

Mr. Robert D. Martin
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Dear Mr. Martin:

Subject: Waterford 3 SES
Docket No. 50-382
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 37
"Temperature Detectors (RDTs) Failure"
Final Report



Reference: LP&L letter W3K84-2957 dated October 31, 1984

The referenced letter provided an interim report on SCD-37 with the Justification for Interim Operation. It stated that the final report would be submitted upon the completion of response time testing.

In accordance with the requirements of 10CFR50.55(e)(3), enclosed are two copies of the Final Report of SCD-37.

Very truly yours,

K.W. Cook
Nuclear Support & Licensing Manager

KWC:GEW:sms

cc. NRC, Director, Office of I&E
G.W. Knighton, NRC-NRR
D.M. Crutchfield, NRC-NRR
NRC Resident Inspectors Office
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FINAL REPORT OF
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 37
TEMPERATURE DETECTORS (RTD'S) FAILURE

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e). It describes a deficiency regarding unreliable temperature signals from Rosemount, Inc., resistance temperature detectors (RTD's). The RTD's supply reactor coolant system (RCS) cold leg temperature signals to the reactor protection system. This problem is considered reportable under the requirements of 10CFR50.55(e). This problem was identified to the Nuclear Regulatory Commission on July 10, 1981, by a utility owner of a C-E NSSS.

DESCRIPTION OF PROBLEM

On July 27, 1981, C-E Power Systems notified Ebasco Services, Incorporated, that errors in the RCS T-cold signal could result in a non-conservative thermal margin/low pressure (TM/LP) trip setpoint and could permit possible operation in excess of departure from nucleate boiling (DNB) limits. C-E does not believe that such operation is likely to occur because the RTD drift is easily detectable by cross channel comparison and simultaneous multiple failures are not deemed credible. The utility has determined that the cause of the erroneous RTD signals was due to resistance changes in the RTD circuitry as a result of corrosion degradation of the RTD leads as the terminal block connection in the head of the RTD assembly. The corrosion was believed to be caused by a galvanic reaction between the dissimilar metals in the RTD leads and the terminal blocks.

CE stated that the affected utility placed the plant in hot standby for approximately twenty-four hours while all accessible safety and non safety related Rosemount RTD's were refurbished.

SAFETY IMPLICATIONS

The galvanic corrosion in RTD's head introduces parasitic resistance into the instrumentation loop. This results in unreliable signals which would essentially indicate lower than actual temperature and adversely affect protective system response. Thus the safety of the plant could be compromised, if left uncorrected.

CORRECTIVE ACTION

A total of 33 Rosemount RTD's were utilized at Waterford 3. Of these 33, sixteen (16) are safety related RTD's installed in steam generator's hot and cold legs which provide input to the Plant Protection System. Eight (8) of these sixteen (16) Rosemount RTD's were replaced with Weed RTD's which leaves eight (8) dual-element Rosemount RTD's which were required to be environmentally sealed. The remaining seventeen (17) are non safety related and are not included in the scope of SCD 37.

Design Change Notice (DCN-NYC-IC-654 R2) was issued to implement the corrective action, and LP&L Condition Identification and Work Authorization (CIWA) 008032 performed this DCN instruction. CIWA 008032 was closed January 8, 1985, based on implementation and documentation completion.

The corrective action consisted of applying two coats of Carboline 1340 clear to all exposed metal surfaces connected or forming part of the terminal strip, top and bottom after connections are made.

Carboline 1340 was preferred over silver soldering since it provided a moisture resistant seal over all exposed metal parts, as well as reducing chances of galvanic corrosion.