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August 9, 1984

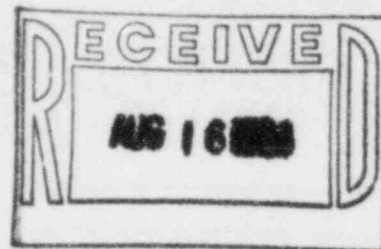
W3K84-1858
Q-3-A35.07.96

Mr. John T. Collins
Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012

REFERENCE: LP&L Letter W3K84-0985 dated April 27, 1984

Dear Mr. Collins:

SUBJECT: Waterford SES Unit No. 3
Docket No. 50-382
Significant Construction Deficiency No. 96
"Failure of Charging Pump A to Start on a SIAS"
Amended Final Report



As a result of a re-evaluation of the safety significance of the subject Significant Construction Deficiency, this amended Final Report is being submitted.

If you have any questions, please advise.

Very truly yours,

T. F. Gerrets

T. F. Gerrets
Corporate Quality Assurance Manager

TFG:CNH:SSTG

Attachment

cc: Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Director
Office of Management
Information and Program Control
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Mr. John T. Collins

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W3K84-1858

Page 2

cc: Mr. E. L. Blake
Shaw, Pittman, Potts & Trowbridge
1800 M Street, N.W.
Washington, D.C. 20036

Mr. W. M. Stevenson
Monroe & Lemann
1424 Whitney Building
New Orleans, Louisiana 70130

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Mr. W. A. Cross
7910 Woodmont Avenue
Suite 1200
Bethesda, Maryland 20814

AMENDED
FINAL REPORT OF
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 96
"FAILURE OF CHARGING PUMP A TO START ON A SIAS"

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e) and supercedes the previously submitted report. This report describes a failure of the CVCS Charging Pump A to start on SIAS as well as other ramifications of the cause of the failure. This problem is considered reportable pursuant to the requirements of 10CFR50.55(e), however, its safety significance has been re-evaluated by Engineering.

To the best of our knowledge, this deficiency has not been reported to the USNRC pursuant to 10CFR21.

DESCRIPTION

During loss of offsite power testing, train "A" Charging Pump did not start an initiation of SIAS. Upon investigation, it was found that a latching relay malfunction (Electro-switch make) in the control circuit caused this problem. Further investigation revealed failures of Electro-switch latching relays in other safety related systems. Systems and/or components which use these relays are the CVCS (charging pumps), High Pressure Safety Injection (HPSI), Essential Services Chilled Water, Instrument Air, Safeguards Pump Room "A" Cooler, Feedwater Isolation Valve (Steam Generator), and Main Steam Isolation Valve.

SAFETY IMPLICATIONS

A re-evaluation of the safety significance of relay failures has been performed for each of the circuits in which they are applied. From this evaluation, it is apparent that none of the Electro-switch latching relays are required to operate during an Engineered Safety Features Actuation Signal (ESFAS). The relays are only required to maintain their present state with no loss of continuity in the control circuits. The ability of the relays to maintain continuity has been proven without failure. Attachment 1 gives a description of each control circuit and its corresponding safety evaluation.

CORRECTIVE ACTION

Two of the failed relays were sent to Electro-switch for evaluation. They were thoroughly examined, the burned out operating coils were replaced and they were subjected to an endurance test of 1,000 cycles each. Electro-switch was unable to find any defects which would have resulted in relay failure.

The following measures were taken to assure the reliable operation of systems utilizing Electro-switch latching relays.

1. All relays were subjected to prerequisite and preoperational functional tests. These tests assured proper installation and wiring of each relay.
2. Plant Operating Procedure OP-904-009 has been written to require testing of all Electro-switch latching relays except the Safeguards Room Cooler relays which are to be inspected. This procedure will be performed until the end of the first refueling, where Engineering Evaluation on the reliability of the relays will be performed.

This report is submitted as a Final Report.

ATTACHMENT 1ELECTRO-SWITCH SERIES 31 LATCHING RELAY FUNCTIONS

(1) Charging Pump AB, CWD #370, Relays A & B.

The latching relays are operated by the AB pump selector switch. When the switch is in the normal position, the AB pump is disabled and the A and B pumps are aligned to their respective flow paths. When the switch is moved to either the A or B position, the pump selected is disabled and replaced with the AB pump. White lights at the selector switch verify that the latching relay cycled as required, and that the proper valve and breaker lineup has been completed to assure proper pump operation. No credit is taken for availability of all three pumps to mitigate an accident. A failure of an Electro-switch relay in this application would be immediately detected and corrective action could be taken in a timely manner without the need for plant shutdown. No action of the relay coil is required to assure operation of the pump during a safety injection signal.

During the performance of SIT-TP-200 (Intergrated Engineered Safety Features Test), standard procedures which include operation of the charging pumps were not followed because the plant was shut down. For this reason, when the selector switch was moved to the "A" side, the pump was not verified to be operable by either starting or by observance of the presence of the white light prior to initiation of a SIAS. Lack of detection of the relay failure under these circumstances is understandable and would not recur during normal plant operation with trained operators.

(2) High Pressure Safety Injection Pump AB, CWD #500, Relays A and B

The Electro-switch relays in this circuit perform the same function as the relays in the charging pump circuit. The same immediate indication of relay failure would be provided to the operator. In addition, the technical specifications require the AB pump to be tested by manually starting with a safety injection test signal anytime it is placed in service.

(3) Component Cooling Water Pump AB, CWD #500, Relays AxA, AxB, BxA, and BxP

Same as Charging Pump AB

(4) Chilled Water Pump P-1 (3C-SAB), CWD #1068, Relays A and B

The latching relays in this circuit are applied in a similar manner to the relays in the Charging Pump circuit except that no white lights are included to indicate proper relay operation. However, in this case, the Chilled Water Pump is operated on a continuous basis so a failure of the Electro-switch relay would be immediately detected when the pump is started in the normal operating mode and corrective action taken. Once again, no relay coil actuation is required to assure operation of the pump during a Safety Injection Signal.

SCD #96

ATTACHMENT 1ELECTRO-SWITCH SERIES 31 LATCHING RELAY FUNCTIONS

- (5) Safeguards Pump Room "A" Cooler (AH-2), CWD #1005, Relay 52x

The latching relay in this circuit is used to start the cooler when HPSI Pump AB is started on the A side. Should the relay fail, the automatic starting of the cooler from the HPSI pump would be disabled, however, the cooler would be started automatically by actuation of the Low Pressure Safety Injection Pump A or the Containment Spray Pump A, which occur concurrent with actuation of the HPSI pump. In addition, a high temperature alarm for the pump room would sound if the cooler failed to start which would provide sufficient time for an operator to start the cooler from the local control station.

- (6) Instrument Air Compressors A and B, CWD #990 and #992, Relays 52x

The latching relays are applied in these circuits to provide isolation between safety-related breaker contacts and the nonsafety-related compressor controls. The compressors themselves are nonsafety-related, therefore, failure of the latching relays would have no safety significance.

- (7) Steam Generator Feedwater Isolation Valves, CWD #1510 and #1526, Relay COX

These relays provide the normal open and close signals to the Feedwater Isolation Valves, however, upon receipt of a Main Steam Isolation Signal, they are overridden and the valves automatically close. Failure of the relays will not impair the safety function of the isolation valves.

- (8) Main Steam Isolation Valves, CWD #16646 and #1661, Relay COX

Same as Steam Generator Feedwater Isolation Valves

bc: R. S. Leddick, F. J. Drummond, R. P. Barkhurst, S. A. Alleman,
L. F. Storz, G. Wuller, L. L. Bass, R. F. Burski, C. J. Decareaux,
K. R. Iyengar, D. W. Herrin, M. I. Meyer, W. M. Morgan, R. A. Savoie, J.
N. Woods, A. Pastor, Licensing Library, Project Files, Nuclear Records

Ebasco - M. Yates, A. M. Cutrona, S. Horton, J. Pertuit

NRC - G. L. Constable