

50-275/323-OLA-2 I-MFP-210 8/23/93

MFP Exhibit 210
8/23/93 DOLLIE FEIGER
Reptr.

I. Plant Conditions

The unit was in Mode 1 (Power Operation) at 100 percent power.

93 OCT 28 P6:25

II. Description of Problem

A. Problem:

In December, 1982, the motor operator for valve SI-1-8805A was overhauled as part of the preventative maintenance program for Limatorque motor operators.

On May 25, 1990, at 1416 PDT, Control room operators took the control switch for motor controlled valve SI-1-8805A to the open position. The valve stroked open. The control switch was then taken to the closed position, and the valve stroked close. The control switch was taken back to the open position, and nothing happened. The control room operator was under the impression that the breaker had failed to close, and proceeded to cycle the breaker several times. Another attempt was made to stroke the valve successfully. One more attempt to stroke the valve failed. Electrical Maintenance was contacted at 1435 PDT and asked to investigate the problem.

An electrician was dispatched to the site. At 1510 PDT the electrician found that the motor was running, and that the declutch lever was bouncing up and down. The control room was contacted, requesting the breaker for the motor be opened to shut off the motor. The motor had been running approximately 50 minutes, and was too hot to touch. Trouble shooting was started on the motor.

At 1738 PDT, a visual inspection at the line starter and terminations found no abnormalities. At 1810, a visual inspection at the valve was performed. A clearance had been hung on the valve after the valve was declared inoperable. The control room operator responsible for hanging the clearance said that the valve was not in manual, and that he depressed the declutch lever and verified that the valve was fully closed using the handwheel.

At 1900 PDT the operator cover was removed and an inspection of the motor connections and the torque switch performed. The inspection did not identify any abnormalities. At 1905 PDT, the valve was stroked fully open with no problems. Upon reaching full closed, however, the torque switch failed to open, and the declutch lever started bouncing. The breaker was opened to shut off the motor. The brake housing cover was then removed, and the current signature equipment installed. Another attempt to stroke the valve then failed with no sign of excessive torquing of the motor. The operator was overhauled and the declutch fork was found installed upside down.

On May 27, 1990, at 1827 PDT, troubleshooting, repair, and testing of the motor operator for valve SI-1-8805A was completed, and the valve was declared operable.

NUCLEAR REGULATORY COMMISSION

Case No. 50-275-CLA Official Exh. No. 7MEP-210
Name of Pacific Gas and Electric Co
IDENTIFIED
RECEIVED
Interviewer RECORDED _____
Contractor Ann Riley & Assoc's DATE 8-23-93
Other _____ Witness _____
Reporter Dollie Feigel

SI-1-8805A FAILED TO CYCLE ON ACTUATION SIGNAL

F. Operator actions:

Operators declared valve SI-1-8805A inoperable and contacted Electrical Maintenance to investigate the problem.

G. Safety system responses:

None.

III. Cause of the Problem

The following is a systematic analysis of root cause as required by NPAP C-23, "Technical Review Groups."

A. Determination of Cause:

I. Human Factors:

a. Communications

Communications occurred in a timely manner between Operations and Electrical Maintenance, and within Electrical Maintenance. Communications is not a factor in this problem.

b. Procedures

Procedures were followed in the handling of the response to the motor operator problem. A procedural problem existed with the procedures governing work on Limitorque motor operators, as the declutch mechanism was installed upside down. The procedures used at the time of the valve overhaul in 1982 did not include specific instructions regarding the installation of the declutch fork.

c. Training

Training was a factor in this problem regarding the training of the technician responsible for the installation of the declutch mechanism. The technician responsible for the overhaul had not been specifically trained on rebuilding of Limitorque motor operators because the training did not exist at the time.

d. Human Error

Personnel error was a factor in this problem in that the declutch mechanism was installed incorrectly by the technician.

e. Management System

Management systems were not involved in this problem. This is not considered a factor in this problem.

II. Equipment/Material

a. Material Degradation

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As a results of the declutch fork being installed upside down and causing incorrect operator function, the worm gear lugs were found to be worn.

b. Installation

The declutch mechanism was installed incorrectly. Installation is a factor in this problem.

C. Immediate Cause:

The technician performing the motor operator overhaul installed the declutch mechanism upside down.

D. Root Cause:

1. A procedure containing appropriate cautions regarding the installation of the declutch fork did not exist in 1982.
2. Training of the technician in 1982 was not adequate in that a training program for the overhauling of Limitorque motor operators did not exist.

IV. Analysis of the Problem

A. Safety Analysis:

SI-1-8805A is one of two parallel valves which open on a SI signal. These valves align the Refueling Water Storage Tank (RWST) with the suction header for the centrifugal charging pumps to allow injection of borated water into the RCS. The operability of either 8805A or 8805B will allow for sufficient flow from the RWST to the RCS. Additionally, valve 8805A fully opened on an actuation signal, as required. In the event of an SI signal, SI-1-8805A would have performed its required safety function. Therefore, no adverse consequences resulted from this problem, and the health and safety of the public were not affected by this problem.

B. Reportability:

1. Reviewed under QAP-15.B and determined to be non-conforming in accordance with Section 2.1.2.
2. Reviewed under NUREG 1022 and determined not to be reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) and (C).
3. This problem does not constitute a 10 CFR 21 reporting problem.
4. This problem does not require reporting via a Network entry because the entry would not provide any new information to other facilities.

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5. Reviewed under 10 CFR 50.9 and determined to be not reportable since this event does not have a significant implication for public health and safety or common defense and security.

V. Corrective Actions

A. Immediate Corrective Actions:

1. The motor operator was overhauled and all worn parts were replaced, and the declutch fork installed correctly. The motor was also replaced as a prudent measure.

B. Corrective Actions to Prevent Recurrence:

1. Electrical Maintenance Procedure MP E-53.10I, "Limatorque SMB-000 Valve Operator Maintenance", and MP E-53.10J, "Limatorque SMB-00 and SB-00 Valve Operator Maintenance", have been revised to include caution statements concerning proper installation of the declutch fork.
2. Technicians performing work on Limatorque motor operators are now trained on the proper method for overhauling Limatorque operators, including the correct installation of the declutch fork.
3. Limatorque motor operators are overhauled every 4.5 years as part of the preventative maintenance program. Approximately 60 percent of the Limatorque motor operators have been overhauled to date, and the improper installation of the declutch fork has been found in only this operator. This problem is considered an isolated incident, and an immediate inspection is not considered necessary.

VI. Additional Information

A. Failed Components:

None.

B. Previous NCRs on similar problems:

None.

C. Operating Experience Review:

1. NPRDS.

Two entries regarding declutch fork problems were found, however, the problems with the declutch forks were different.

2. NRC IE Information Notices, Bulletins, generic letters.

None.

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3. INPO SOERs and SERs.

None.

D. Trend Code

EM - C - 3 :Electrical Maintenance, Material/Equipment Deficiency, Installation

EM - B - 1 :Electrical Maintenance, Procedure Deficiency, No Procedure

EM - A - 2 :Electrical Maintenance, Personnel Error, Training Deficiency

E. Corrective Action Tracking:

1. All corrective actions are complete. No tracking AR is necessary.

F. Footnotes and special comments:

INPO instructions and diagrams regarding overhauling of Limitorque motor operators provide more detail than Limitorque drawings, and clarify the necessary steps to be taken when performing maintenance.

F. References:

1. Initiating Action Request A0193445.

G. TRG Meeting Minutes:

6/27/90

1. The TRG discussed the problem description and the chronology. The overhaul date for the operator will be included in both. (To be provided by M. Fraunheim)
2. The worm gear was removed as an inoperable component that contributed to the problem because the damage to the worm gear lugs was a result of the problem, and not a cause.
3. The causal factor analysis was discussed. Procedures, training and human error are considered factors in this event.
4. The immediate cause was determined to be improper installation of the declutch fork. The root causes were determined to be an inadequate overhaul procedure in 1982, and inadequate training in 1982.
5. CAPR were discussed and will include procedure revisions since 1982, training programs initiated since 1982, and the recurring overhauls on Limitorque operators. Since 2/3 of the Limitorque operators have been overhauled to date, and this is the only instance of a declutch fork being installed upside down, this

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incident is considered isolated. It is not necessary to check every operator in the plant immediately.

6. The question was posed as to why it took eight years for the operator to fail. The reason for the extended time to failure is due to aging and stressing of components. With the declutch mechanism installed upside down, the declutch mechanism only partially engages. The partial engagement causes excessive stress on the load bearing surfaces and will eventually cause failure.
7. M. Fraunheim to provide verification of date of last overhaul of operator and verification that the caution regarding fork installation was not included in the 1982 procedure. If it was, the TRG will have to reconvene to discuss root cause.