

50-275/323-OLA-2
I-MFP-52

MFP Exhibit 52
8/18/92 DOLLIE FEIGEL
REPORTER
NCR DC1-93-EM-N019 Rev. 00
DRAFT: May 12, 1993

'93 OCT 28 P 6:29

MANAGEMENT SUMMARY

On April 1, 1993, AR A0301192 was written to document that the rear hinged panel of the Unit 1 RHF panel was found with no fasteners installed to secure the hinged panel to the main panel. The fasteners were in a plastic bag in the bottom of the panel. This condition was considered a potential loss of seismic qualification that could have impacted the operability of vital 4kV bus F and its associated diesel generator during a seismic event.

Preliminary root cause: Responsibility for panel restoration was not assigned to any of the groups performing concurrent work in the panel.

Corrective actions are to be determined.

This draft, dated May 12, 1993, includes the meeting minutes from the 5/12/93 TRG. The TRG discussed the preliminary root cause analysis, event safety analysis, and proposed corrective actions. The TRG will reconvene at the end of July to finalize root cause and corrective actions.

NUCLEAR REGULATORY COMMISSION

Docket No. 50-275-OLA Official Exh. No. MFP 52
 In the matter of PACIFIC GAS AND ELECTRIC CO

Staff _____ IDENTIFIED
 Applicant _____ RECEIVED
 Intervenor _____ REJECTED _____
 Co-Applicant _____
 Contractor Ann Kiley Assoc DATE 8-18-93
 Other _____ Witness _____
 Reporter Dollie Feigel

9311190402 930818
PDR ADOCK 05000275
G PDR

G. Method of Discovery:

Quality Assurance personnel, during the performance of an inspection in the cubicle, identified the problem.

H. Operator Actions:

None.

I. Safety System Responses:

None.

III. Cause of the Event

A. Immediate Cause:

The fasteners for the rear hinged panel of the Unit 1 RHF panel were not re-installed following maintenance/construction related activities.

B. Determination of Cause:

1. Human Factors:

- a. Communications: There is a potential for lack of communication between various groups performing work on the vital bus.
- b. Procedures: Procedures do not normally go to the level of detail requiring individual bolt removal/reinstallation.
- c. Training: Potential for increased awareness on ownership of activities related to fasteners.
- d. Human Engineering: Less cumbersome hinged panel fasteners could increase probability of proper refastening in future. Presently there are 15 bolts required.

e. Management System:

2. Equipment/Material:

- a. Material Degradation: N/A
- b. Design: See Human Engineering above.
- c. Installation: N/A
- d. Manufacturing: N/A
- e. Preventive Maintenance: N/A
- f. Testing: N/A
- g. End-of-life failure: N/A

C. Root Cause:

Preliminary root cause: Responsibility for panel restoration was not assigned to any of the groups performing concurrent work in the panel.

D. Contributory Cause:

To be determined.

IV. Analysis of the Event

A. Safety Analysis:

As discussed in the initial TRG meeting on April 15, 1993 and in the NSARA licensing positions (ref. 5), seismic events and seismic qualification need not be considered when determining operability for this component. Evaluations on the tracking and initiating ARs (ref. 2) will document that the F bus and its associated DG would have been operable before and after a postulated seismic event. In addition, only two vital 4kV buses are required to safely shut down the plant, and buses G and H were verified as having the hinged panel fasteners installed.

In addition, a review of the FSAR, Chapter 15 regarding a Loss Of Offsite Power (LOOP), determined that the existing analysis bounds this event. Plant vital instrumentation required for reactor trip will be feed from DC power, the steam generator safeties will provide heat dissipation if the PORV's are not available. The AFW system is not assumed until 122 seconds into the LOOP event. Assuming a 30 second seismic event, a ten second subsequent diesel start, and worst case sequenced timing of 28 seconds for Bus H results in a total AFW time of 58 seconds. Furthermore,

there is sufficient AFW system redundancy to withstand a single active failure in addition to the subject Bus F unavailability during a seismic event.

Therefore, this condition did not adversely affect the health and safety of the public.

B. Reportability:

1. Reviewed under QAP-15.B and determined to be non-conforming in accordance with Section 2.1.2 as a significant non-routine event that may adversely affect the safe operation of the plant and may require reporting to the NRC.
2. Reviewed under 10 CFR 50.72 and 10 CFR 50.73 per NUREG 1022 and determined to be not reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the Technical Specifications, since the bus and the DG were not inoperable in excess of the allowed outage time due to this condition.

In addition, this condition was determined to be not reportable under 10 CFR 50.72 (b)(2)(iii)(A) and 50.73(a)(2)(v)(A) as a condition that alone could have prevented a safety function, and not reportable under 50.72(b)(1)(ii) and 50.73(a)(2)(ii) as a condition outside the design basis that significantly compromised plant safety. The condition represented a potential loss of seismic qualification, and "alone" (i.e., without assuming a concurrent seismic event) is not significant. In addition, the two redundant 4kV buses G and H were verified not to be in this nonconforming condition. See "Safety Analysis" above.

3. Reviewed under 10 CFR Part 21 and determined that this condition will not require a 10 CFR 21 report, since (a) it is being evaluated under 10 CFR 50.72/73, and (b) it does not involve defects in vendor-supplied services/spare parts in stock.

4. This condition will not be reported via an INPO Nuclear Network entry.
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.
6. Reviewed under the criteria of AP C-29 requiring the issue and approval of an OE and determined that an OE is not required.

V. Corrective Actions

A. Immediate Corrective Actions:

1. The fasteners were replaced on the same day they were discovered uninstalled (ref. 2).
2. The fasteners were verified to be installed on the similar panels in vital 4kV buses G and H.

B. Investigative Actions:

1. Evaluate the design basis of the fasteners for the RHF hinged panel.

RESPONSIBILITY: M. Khan ECD: RETURN
DEPARTMENT: NES - Seismic
Tracking AR: A0303415, AE #01

2. Evaluate the potential for relay contact chatter on the RHF hinged panel, and the resulting impact on operability before and after a postulated seismic event.

RESPONSIBILITY: M. Khan ECD: 5/22/93
DEPARTMENT: NES - Seismic
Tracking AR: A0303415, AE #02

3. Develop a timeline of events to assist in determining appropriate corrective actions.

RESPONSIBILITY: Hanson/Shortt ECD: RETURN
DEPARTMENT: Electrical Maintenance
Tracking AR: A0303415, AE #03

4. Determine the consequences of a loss of offsite power concurrent with a seismic event. The concern is that with Bus F unavailable during a seismic event due to the missing fasteners, and assuming a single active failure of another vital bus, does this result in being outside of the design basis?

RESPONSIBILITY: B. Supremo ECD: 7/15/93
DEPARTMENT: NES Electrical Engineering
Tracking AR: A0303415, AE #06

5. Investigate development of a bus maintenance procedure and/or checklist to ensure proper line up of bus components following significant maintenance or construction activities.

RESPONSIBILITY: Foat ECD: 07/15/93
DEPARTMENT: Electrical Maintenance
Tracking AR: A0303415, AE #07

C. Corrective Actions to Prevent Recurrence:

1. Write an AT-EWR for a design change to the Unit 1 4kV safeguards panels to replace the multiple screws securing the rear hinged panel with one bolt, similar to the Unit 2 panels.

RESPONSIBILITY: R. Hanson ECD: RETURN
DEPARTMENT: Electrical Maintenance
Tracking AR: A0303415, AE #04
Outage Related? No
OE Related? No
NRC Commitment? No
CMD Commitment? No

The May 12, 1993, TRG determined that this is a prudent action. Not required for NCR closure.

PROPOSED

1. (Require some mechanism, for example a maintenance procedure, when groups report off of an extended bus outage, in order to ensure the configuration of knife switches, bolting, etc. are satisfactory. This would be similar

to a valve checklist to ensure the proper line-up of components prior to returning the system to service.)

RESPONSIBILITY: _____ ECD: _____
DEPARTMENT: _____
Tracking AR: AO _____, AE # _____
Outage Related? Yes/No OUTAGE: (_R_ or U_FO)
OE Related? Yes/No
NRC Commitment? Yes/No
CMD Commitment? Yes/No

D. Prudent Actions (not required for NCR closure)

*** PROPOSED *** Develop a lamacoid for the vital bus RHF, RHG, and RHH panels indicating that the fasteners are required for seismic qualification of the associated relays.

RESPONSIBILITY: Hanson ECD: _____
Tracking AR: AO _____

VI. Additional Information

A. Failed Components:

None.

B. ~~Previous~~ Similar Events:

NCR DC0-89-EM-N075, "Loose or Missing Fasteners in Electrical Equipment": The common factor in this previous NCR was a lack of programmatic guidance in resolving fastener problems. The corrective actions amounted to the establishment of a program for identification and resolution of loose, missing, or damaged fasteners. Although this program did help in evaluating and determining immediate actions after the current event, it did not prevent the current event, where fasteners were not reinstalled after work by multiple groups during an extended bus outage during 2R5.

NCR DC0-90-EN-N016, "Control Panels, Inadequate Seismic Qualification": The two root causes of

this previous NCR were a lack of procedural guidance on coordinating design changes with Westinghouse and a lack of documented seismic design bases. The corrective actions did not prevent the current NCR because the current problem was with maintaining the existing seismic qualification, not with documenting changes to the design.

NCR DC0-91-EM-N005, "4kV Switchgear": This previous NCR dealt specifically with the 4kV switchgear door bolts. Root causes were less-than-adequate design and lack of guidance/criteria for "tight" bolts. Because the NCR was specific to the outer door bolts, it did not prevent the current event regarding the inner rear hinged panel bolts.

C. Operating Experience Review:

1. NPRDS:

Not applicable.

2. NRC Information Notices, Bulletins, Generic Letters:

To be determined.

3. INPO SOERs and SERs:

To be determined.

D. Trend Code:

Responsible department ___, and cause code ___.

To be determined.

E. Corrective Action Tracking:

1. The tracking action request is A0303415.

2. Are the corrective actions outage related?

To be determined.

F. Footnotes and Special Comments:

None.

G. References:

1. Technical Specification 3.8.1.1
2. Initiating Action Request A0301192
Action Request A0300421, AE02
3. PG&E drawing nos. 441354 and 441357
4. Operations Department Policy B-24, "Vital 4kV
Switchgear Operability," Rev. 3 (5/08/92)

Memorandum from NECS - Project Engineer (M. Tresler) to DCPD - Maintenance Services (B. Giffin), dated June 12, 1990, "4kV Switchgear Bus Opened Doors and Panels" (CHRON 153041)

5. Memorandum from the Manager, NSARA (J. Hoch) to Electrical Engineering (R. Hanson), dated January 22, 1993, "Input to TRG for NCR DC0-91-EM-N005" (CHRON 202236)

Memorandum from the Manager, NSARA (J. Hoch) to Various, dated February 5, 1993, "Licensing Position Regarding Concurrent Seismic Event and Loss-of-Coolant Accident"

H. TRG Meeting Minutes:

On April 15, 1993, the initial TRG convened and considered the following:

1. Previous problems with bolting on the 4kV switchgear were concerned with the door bolting. However, the previous conclusions regarding operability (Ops Policy B-24, NSARA memo) appear to be applicable to the current situation, since relay contact chatter would only be an issue during concurrent seismic and LOCA events.
2. NES - Seismic is continuing to evaluate the design basis of the fasteners. Their initial evaluation is that the structural integrity of

the panel is maintained, and that the panel would remain functional after a postulated seismic event. Therefore, using the NSARA memo, this condition is a non-reportable "outside design basis" and is not a violation of a TS LCO.

3. The TRG discussed Operations management's recommendation to consider implementing a mechanism to ensure that electrical component configuration is satisfactory when reporting off an extended clearance on a bus -- this would be analogous to the valve checklists used prior to returning a piping system to service.
4. This TRG is tentatively scheduled to reconvene on Thursday, 4/22/93 at approximately 10AM.

On April 22, 1993, the TRG reconvened and considered the following:

1. The TRG reviewed the determinations at the previous meeting that the event was not reportable, since operability did not need to consider a seismic event coincident with a LOCA. The 6/12/90 Engineering memo that is the basis for Ops policy D-24 again goes back to structural integrity of the cabinets and doesn't really discuss the internal relay board fasteners.
2. The chronology of work activities in and near the area was not conclusive. It did show, however, that there were several different groups working in the panel during the outage. The screws were often found unfastened, and therefore left unfastened by one group, because of concurrent work by another group.
3. The TRG further discussed the possibility of adding a checklist to walk down the bus configuration prior to the PMT. However, some concerns were discussed: Should the scope be focused on only the 4kV vital switchgear? Would the walkdowns be required only after major bus outages, or after any work? Would a procedure, or a generic work order step, or

some other mechanism require them? What about work done without using a clearance or other paperwork (e.g., Rev. A walkdowns)? The SFM should not be bogged down with worrying about 4kv relay board fasteners in addition to all his other duties. Ops does not want to revise the existing B-24 policy to also cover internal fasteners - since they are inside the cabinet, how could an operator on rounds verify they are installed tight?

4. Electrical Maintenance will discuss these concerns with management. Meanwhile, a corrective action to prevent recurrence of this specific incident will be to request a DCN to replace the Unit 1 fasteners with the simpler, seismically qualified Unit 2 design (one knob to close and secure the panel).
5. This TRG will reconvene in mid-May 1993.

On May 12, 1993, the TRG reconvened and considered the following:

1. The safety analysis and associated reportability was re-visited. There was concern expressed that a Loss of Offsite Power (LOOP) is not considered in the safety analysis and therefore, may not have been addressed when the reportability determination was made. The TRG members agreed that as long as the existing Chapter 15 Analysis bounds this event, then there is no design basis reportability concern. Preliminary review by regulatory compliance determined that the existing analysis bounds this event. Refer to Safety Analysis section. A new investigative action will be assigned to engineering for evaluation and documentation of the consequences of a LOOP concurrent with a seismic event for this situation.
2. Preliminary root cause analysis was presented by electrical maintenance. No definitive root cause has been determined, but it appears to be related to a lack of responsibility for panel restoration by the groups performing concurrent work within the panel. The TRG

further discussed that this is an isolated event since the majority of activities within a panel are associated with a single work activity.

3. Although this event is considered isolated, the TRG looked at overall bus restoration activities and determined that there is a potential programmatic weakness (i.e. a bus restoration procedure may have prevented this event).
4. Proposed corrective action discussed to develop a maintenance procedure for returning an inoperable bus to service. This procedure could be developed on a "cubicle" basis and could be tracked via TS tracking sheets. An investigative action was assigned to address this potential corrective action.
5. Initiation of a "lessons learned" memorandum was discussed. This could be a prudent action, but would become a corrective action only if personnel error or training is an issue.
6. The TRG will reconvene at the end of July provided no design basis reportability issues are determined by regulatory compliance.

I. Remarks:

None.