



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

2/16/84

F. M. Magli  
Action ASAP.  
I need some  
answer parts.

NOTE FOR:

~~Barry~~  
Thomas M. Novak  
George W. Knighton

FROM:

~~Hans Schierling~~

SUBJECT:

DIABLO CANYON - FAILURE OF CIRCUIT BREAKERS AND SNURRER

DE  
2/23

The following information on the subject was provided to me in a telephone call from Tom Bishop and Harvey Canter of Region V on February 15, 1985 - 5 PM.

Electrical Circuit Breaker Failure

PG&E recently noticed frequent failures of GE-Magnablast 4KV ML 13 breakers

There are about 30 such breakers that feed all 3 vital busses, probably many more nonvital throughout the plant.

The failure is in a small teflon bushing in the operating mechanism. The bushing breaks as result of frequent operation.

PG&E is now replacing teflon bushings with metallic bushings. Replacement to be completed by about March 10, 1984.

PG&E also noticed poor construction of breakers during current replacement. Poor welding on breaker components.

Region V thinks that failure of teflon bushings was subject of a Technical Information Bulletin in 1974. Apparently no action taken by PG&E at that time. Region V is looking into background.

Issue: Is above generic?  
Complete resolution needed before going critical?  
Part 21 compliance?  
What is qualification of breakers?

8403090022XA

3pp

Large Snubber Failure

PG&E found cracked/broken bolt in large snubber on Unit 2 steam generator. Exact date unknown, maybe February 15, maybe 6 weeks ago.

Manufactured in/by Willis in California.

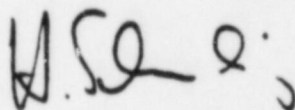
Such bolt failure apparently also came up in 1976 and action was to be taken.

Failure is attributed to hydrogen intrusion causing embrittlement and failure.

Heat-up of Unit 1, i.e. Mode 4 and 3, scheduled for February 11 has been delayed pending further investigation by PG&E

Issue:    Generic problem?  
          Was action taken in 1976?  
          Is this isolated case?

Region V will provide update on both issues.



Hans Schierling

P.01

In line with our policy of keeping users informed of conditions which could possibly affect breaker operation, the following information is provided on type ML-13 breaker mechanism.

REPLACEMENT OF TUF-LOC SLEEVE BEARINGS WITH ALUMINUM BRONZE SLEEVE BEARINGS ON SELECTED RATINGS OF MAGNE-BLAST BREAKERS

Although these breakers were properly qualified according to all applicable industry standards, field experience has shown a few cases that involved more than normal wear of the Tuf-Loc sleeve bearing in ML-13 operating mechanism used on the following rated breakers: AM-4.16-250-8(\*)B & 9(\*)B, AM-4.16-350-1(\*), AM-4.16-350-2(\*), AM 7.2-500-6(\*)B, AM-13.8-750-5(\*)B, and AM-13.8-1000-3H of all current ratings. (\*=H, C, L, or F). (These breakers have a Short Time Momentary current rating of 80,000 RMS total amperes.) These sleeve bearings are Teflon coated fiberglass.

Although our experience indicates that this condition has almost always been associated with breakers applied to repetitive duty, such as Gas Turbine installations or Power House Auxiliaries, it can also be experienced with any breaker of the previously mentioned types, models, and ratings.

Evidence of the condition may be indicated in the following ways:

1. Excessive play and wear of the bearings in the linkage, pawls, etc. of the mechanism, and,
2. Difficulty in obtaining and holding the required adjustments, including the primary contact wipe of the breaker and the mechanism.

To minimize the possibility of a breaker problem and to increase the life of the bearings in the mechanism, particularly for those used on repetitive duty, we recommend that you promptly and regularly inspect the breaker's contact wipes. You should also consider replacement of the Tuf-Loc bearings with Aluminum Bronze bearings. The Aluminum Bronze design was qualified and introduced into all new breakers since 1975.

The replacement of Tuf-Loc bearings with Aluminum Bronze bearings should be part of a regular maintenance program, or where the condition evidences itself. These may be ordered through your local General Electric Company Sales Office.

ORDERING INFORMATION

1. Order Cat #0156C9403 G-1 Aluminum Bronze sleeve bearing replacement kit, quantity one (1) required per breaker. This will provide the twenty-one (21) sleeve bearings - seven different sizes - required for each mechanism.
2. Order one (1) copy drawing 0156C9403. This drawing outlines a suggested procedure for replacing the sleeve bearings.
3. Order D50H15 grease. When reassembling parts lubricate with D50H15 grease as specified in drawing 0156C9403.

TG. J.T. BEARD. N.R.C. BETHESDA MD

RAPACOU# - 301-492-8110

Service Advice 31B  
GENERAL: ELECTRIC