

AVAILABILITY DATA PROGRAM

Report to Nuclear Utility Management

Concerning Power Plants with
C-E Nuclear Steam Supply Systems

Quarterly Report
March, 1981

Combustion Engineering, Inc.
Nuclear Power Systems
Windsor, Connecticut

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1.0 INTRODUCTION

The Availability Data Program (ADP) is a reporting system for performance and reliability concerns of operating plants incorporating Combustion Engineering Nuclear Steam Supply Systems (NSSS). Through this program C-E receives information on equipment problems which degrade the capacity or restrict the performance of systems at a nuclear power plant. Reports returned by the utilities assist C-E in developing availability design improvements for operating, as well as future plants. Utilities benefit from the resulting productivity and availability recommendations returned through ADP Infobulletins and reports.

C-E would like the utilities to return information on events that cause a power reduction or plant shutdown, events that extend an outage or prevent achieving rated power levels, and on failure of significant NSSS or balance of plant (BOP) equipment. For each event reported, C-E would like to know the component or system affected, cause, duration of the outage, and corrective action taken.

Current topics, report section 2.0, provides information on loss of a 125V DC bus, undetected reactor trip circuit breaker undervoltage device malfunctions, and an update on control element assembly drop events. ADP data received this quarter, quantified by system affected and by problem basis, are discussed in section 3.0. Plant performance statistics for 1980 are provided in section 4.0.

2.0 CURRENT TOPICS

Topics of general interest are discussed in this section. Issues discussed include:

- Loss of a 125 V DC Bus
- Undetected Malfunction of Reactor Trip Circuit Breaker Undervoltage Devices
- Control Element Assembly (CEA) Drop Update

2.1 Loss of a 125V DC Bus

During January, a plant experienced a transient initiated by the loss of a 125V DC bus. The 125V DC system supplies control power to the reactor trip breaker switchgear system, the plant annunciator system, and various plant instrumentation and control devices.

The inadvertent trip of the 125V DC bus breaker removed control power from four of the eight reactor trip breakers, causing a reactor trip. Various expected trips and transfers did not occur, due to the loss of DC control power. The resultant loss of automatic turbine trip function required the operators to manually trip the turbine, following the reactor trip. This action prevented overcooling and depressurization of the reactor coolant system. The generator breakers did not open on the turbine trip due to the DC bus loss. Therefore, the generator remained connected to the grid and began to motor.

The DC bus was reenergized approximately fifty seconds after the reactor trip. This return of control power resulted in a generator trip, main steam isolation valve closure, main feedwater pump trip and fast transfer of several power buses to the reserve station service transformer (RSST). However, a breaker connecting the 6900V non-

emergency bus to the RSST immediately tripped on overcurrent due to the simultaneous reenergizing of two reactor coolant pumps and a condensate pump. The operators left the 6900V bus deenergized for the remainder of the event.

As a result of the various bus power transfers, a number of instrumentation fuses were blown, causing the loss of the following indications: main steam header pressure, auxiliary feedwater flow rate, condensate storage and surge tank levels, primary makeup water tank level, boric acid storage tank level, charging pump pressure and flow, all computer indications and functions, and the Terry Turbine steam supply pressure. These indications were restored two to three hours later. After approximately five hours in hot standby condition, a plant cooldown to cold shutdown was initiated.

2.2 Undetected Malfunction of Reactor Trip Circuit Breaker (TCB) Undervoltage (UV) Devices

During November, a utility reported that three reactor TCB UV trip devices failed to operate as expected. Specifically, one UV device failed to trip while two other UV devices tripped sluggishly. This malfunction of the UV device could have gone undetected during routine Reactor Protection System (RPS) surveillance testing because the UV trip device and the TCB shunt trip device are tested simultaneously.

Undervoltage and shunt trip devices are provided for each TCB. The UV device, which is normally energized during reactor operation, deenergizes to trip upon receipt of a trip signal. In addition, the shunt trip device, which is normally deenergized during reactor operation, energizes to trip upon receipt of a trip signal. Testing of the TCB trip devices is normally performed monthly during RPS

surveillance testing by either inserting a single RPS trip path signal or by operating one of two manual trip pushbuttons. However, testing the TCBs in this manner does not independently test the shunt and UV trip devices.

Although the UV devices did not function as expected, the ability to trip the reactor either manually or upon RPS signal was available by means of the TCB shunt trip device. To ensure operability of the UV trip devices, one utility has developed procedures to independently check their operation on a monthly basis.

The following actions are recommended to improve the reliability of reactor trip switchgear circuit breakers with dual trip capability:

1. Preventive maintenance in accordance with the manufacturer's recommendations should be performed once every refueling interval unless periodic testing indicates that a more frequent interval is required.
2. Independent actuation of the UV trip device and the shunt trip device should be verified during normal surveillance testing.
3. Continue to perform response time testing of these circuit breakers on a refueling basis.

2.3 Control Element Assembly (CEA) Drop Update

Historically the frequency of unplanned CEA drops in C-E magnetic jack Control Element Drive Mechanisms (CEDM) has been 4 to 5 CEA drops per reactor year. Through 1980 a total of almost 140 unplanned CEA drops have occurred in six operating plants. Of the total reported CEA drops, 40 have been identified as caused by the power supplies in the control system. Corrective actions have been implemented by all utilities to improve the reliability of the power supplied to the CEDM control systems. These corrective actions have significantly reduced the frequency of CEA drops.

An additional forty CEA drop events reportedly occurred due to a variety of causes including failed timer modules, incorrect voltage setpoints, circuit breaker/fuse problems, testing, and miscellaneous problems.

For sixty of the reported CEA drops, the causes could not be identified and were reported as unknown. In an attempt to further reduce the drop frequency, a C-E program to identify the unknown drop causes was undertaken. In November of 1980, a CEA problem report form was issued to the operating utilities so that each dropped CEA, the conditions under which it dropped, and the suspected cause of the drop could be consistently reported to C-E. From November, 1980 through March, 1981, C-E NSSS plants have experienced only six unplanned CEA drops, or a frequency of about 2 drops/plant/year. Feedback through the CEA problem report form will be used to provide data to further define the root cause for CEA drop incidents.

TO: H. B. KAH;
AWS BLDG. (2)
SONGS 1

August 7, 1981

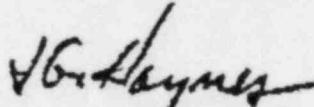
Mr. J. M. CURRAN

SUBJECT: Availability Data Report, Combustion Engineering, January/March, 1981

The Reliability Task Force recently completed its review of the subject availability data report (attached). One item was identified for inclusion in maintenance procedures for San Onofre 2&3.

Item 2.2 of the attached report identifies a potential problem with VV trip devices on reactor scram breakers at Combustion Engineering plants. The problem could lead to a malfunction of the reactor protection system and would not be identified during the routine reactor protection system testing.

If not already included, please incorporate the recommendations of sections 2.2 of the report in the appropriate maintenance procedures for San Onofre Nuclear Generating Station.


J. G. HAYKES

WFricks:0356
Attachment

cc: W. W. Strom
Reliability Task Force Members
W. G. Frick
W. G. Zintl
R. M. Santosuosso
CDM Files

September 29, 1981

MR. H. B. RAY

SUBJECT: Log Assignment 81-199
CE Undervoltage Trip Devices

REFERENCE: Letter to Mr. J. G. Haynes from J. C. Hall (CE) dated May 27, 1981 ✓

This is to advise you of the action taken to resolve the problem of insufficient testing of reactor trip breakers.

Item 2, Page 2-3 of Reference:

Procedure S023-II-11.161 is being drafted to provide instructions to test the series and shunt tripping of the breakers ~~on a 31 day frequency~~. The method of testing requires the removal of fuses and installation of temporary jumpers to assure that the breaker(s) trip properly in response to series and shunt actuated trip signals.

A startup problem report has been submitted to consider the installation of trip test switches on the breakers. These switches would serve to simplify testing and eliminate the requirement to pull fuses and install jumpers.

Item 3, Page 2-3 of Reference:

Currently, response time testing is in progress at Unit 2 and the reactor trip breakers are included in the testing. Station procedures are in the process of development to accomplish future testing. The reactor trip breakers are being included in the procedures.

B. Katz 1/11/92
B. KATZ

WHR:dh:357v

cc: W. H. Ray
G. Wilczek
T. Egan

4

Southern California Edison Company

P O BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD CALIFORNIA 91770

December 3, 1981

D. E. NUNN
PROJECT MANAGER

TELEPHONE
(213) 572-1816

RECEIVED
12/10/81
INTERFACE
MEETING
R.D.

Mr. V. C. Hall
Project Manager
Combustion Engineering
1000 Prospect Hill Road
Windsor, Connecticut 06095

Dear Mr. Hall:

Subject: Surveillance Testing of Reactor Trip Circuit Breaker
San Onofre Nuclear Generating Station
Units 2 and 3

References: (A) Startup Problem Report 2213 (Copy Attached)
(B) I.E. Circular No. 81-12

The present design of the reactor trip circuit breaker does not permit independent actuation of the undervoltage trip and the shunt trip devices during normal surveillance testing. Such a design has been recommended in (NRC's) IE Circular No. 81-12 to ensure continued operability of the dual trip feature.

Please proceed with a design change to provide this feature. We request that the documentation of this design change be submitted to us by January 31, 1982.

We have attached for your use a copy of SONGS 2 & 3 Startup Problem Report 2213, in which a schematic for implementing this design change has been suggested.

If you have any question on the above, please contact our Mr. A. Ahmed at our SONGS 2 & 3 project site (Telephone: (714) 498-1000, extension 383).

Sincerely,



PTC Southern Edison - TEST

NRC-CIRC-81-12



AN ONOFFRE NUCLEAR GENERATING ST ON
STARTUP PROBLEM REPORT
JOB NO. 10079

SPR 2213
PBI _____
PAGE 1 OF 2

BLOCK NO

1 UNIT NO 2E3		2 COMPONENT ID NO SCHEME NO L-32 / MT1-1		3 COMPONENT NAME DESCRIPTION FPS CABINET MAN. TRIP SWITCH	
4 STARTUP SYSTEM NAME REACTOR PROTECTION			5 SUBSYS DESIGNATOR SBA		6 PRIORITY/AREA 6.0/2R2
7 REFERENCE DOCUMENTS UNITED ELECTRIC CONTROL INC. DRAWING NO. 8052-B5.3			8 ORIGINATOR G. WILCZEK PAX 564		ORGANIZATION SCE I&C DATE 9/26/81
9 PROBLEM DESCRIPTION THE REACTOR TRIP CIRCUIT BREAKER IS TESTED MONTHLY DURING RPS SURVEILLANCE TESTING. TESTING THE TCB IN THIS MANNER DOES NOT TEST THE SHUNT AND UNDERVOLTAGE TRIP DEVICES. (SEE ATTACHED REF. DRAWING.) (REF. SPR-20874) NRC I-E Circular 81-12					
10 RECOMMENDED CORRECTIVE ACTION REPLACE PUSH BUTTON MT1 1 WITH A SPRING LOADED SWITCH RETURN TO "NORMAL". THIS WILL ALLOW INDEPENDENT TESTING OF THE UV AND SHUNT TRIP COIL DEVICES (SEE ATTACHED SUGGESTED REF. DRAWING)				11 CLASSIFICATION <input checked="" type="checkbox"/> ASME <input type="checkbox"/> III <input type="checkbox"/> PROT. <input type="checkbox"/> PART PERFORMANCE J. Prabhu COG SU ENGINEER PAX 519 DATE 10/5/81	
12 ASSIGNMENT FOR RESOLUTION E. Prabhu, Trish AFTAB			13 <input checked="" type="checkbox"/> SCE <input type="checkbox"/> BPC <input type="checkbox"/> GEC <input type="checkbox"/> CE <input type="checkbox"/> OTHER STARTUP <input checked="" type="checkbox"/> ENGINEERING <input checked="" type="checkbox"/> CONSTRUCTION _____ QA/QC _____ OPERATIONS _____		14 K. E. O'Connor 10/3/81 RESP TEST OPS SUPV DATE Paul Tsing 10/5/81 RESP STARTUP QA DATE
15 RESOLUTION DUE DATE 10-20-81			16 RESOLUTION CORRECTIVE ACTION		
			DOCUMENT ISSUED _____ NONE DCN NCR FCR DCP OTHER		
17. RESOLUTION CORRECTIVE ACTION ACKNOWLEDGED			18. Q.A. REVIEW		
RESPONSIBLE TEST OPS SUPV		DATE	RESPONSIBLE ORGANIZATION		DATE
NAME		TITLE	NAME		DATE

emergency bus to the RSST immediately tripped on overcurrent due to the simultaneous reenergizing of two reactor coolant pumps and a condensate pump. The operators left the 6900V bus deenergized for the remainder of the event.

As a result of the various bus power transfers, a number of instrumentation fuses were blown, causing the loss of the following indications: main steam header pressure, auxiliary feedwater flow rate, condensate storage and surge tank levels, primary makeup water tank level, boric acid storage tank level, charging pump pressure and flow, all computer indications and functions, and the Terry Turbine steam supply pressure. These indications were restored two to three hours later. After approximately five hours in hot standby condition, a plant cooldown to cold shutdown was initiated.

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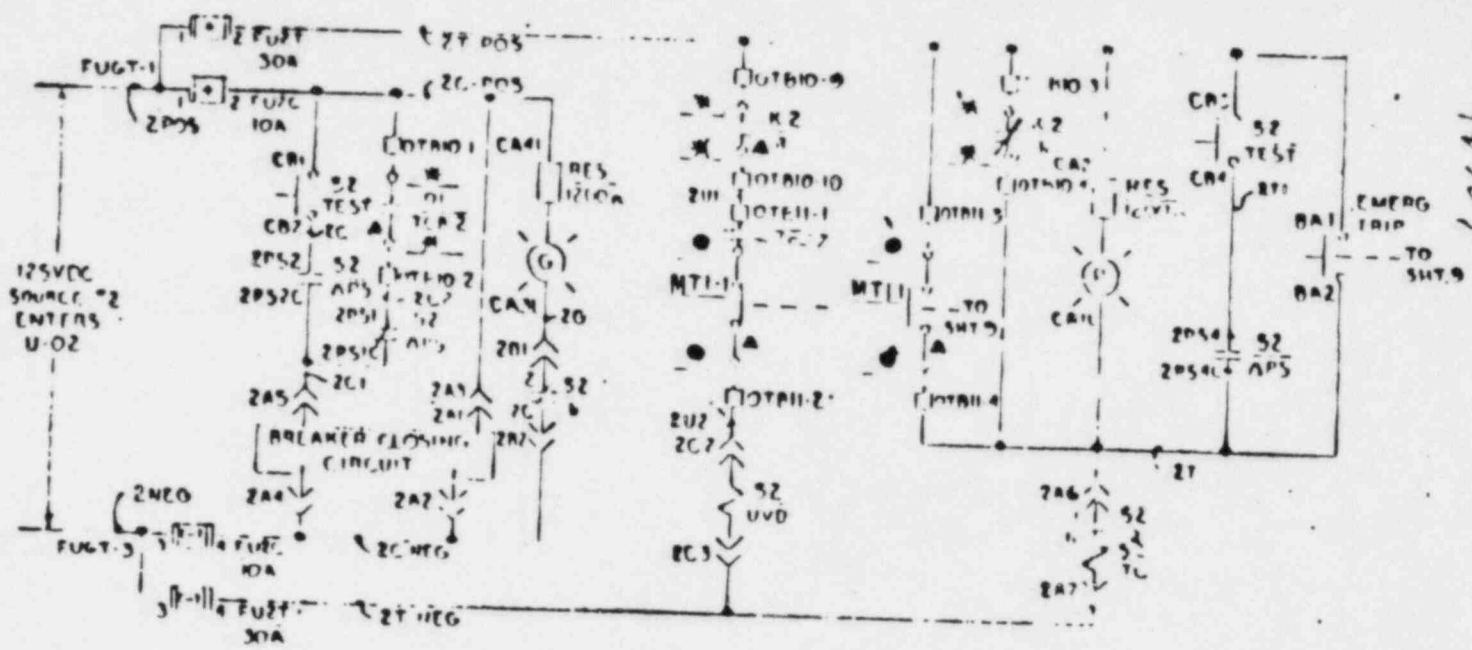
JHR 7/20/12
page 3 of 4

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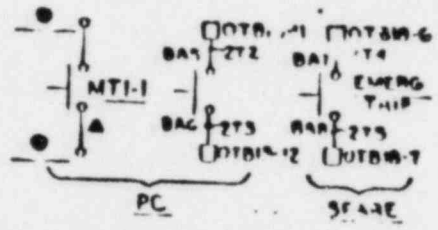
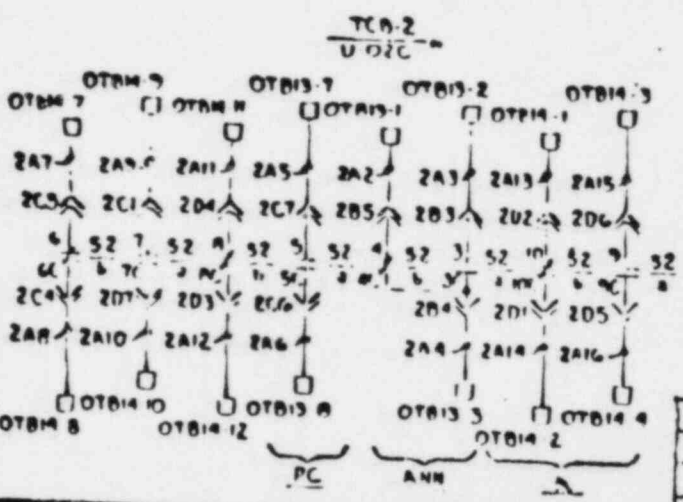
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The following actions are recommended to improve the reliability of the reactor trip circuit breakers with dual trip capability:

1. Preventive maintenance in accordance with the manufacturer's recommendations should be performed once every refueling interval unless periodic testing indicates that a more frequent interval is required.
2. Independent actuation of the UV trip device and the shunt trip device should be verified during normal surveillance testing.
3. Continue to perform response time testing of these circuit breakers on a refueling basis.



LOCAL



- A - EXTERNAL CONTACTS TO RT50
- - UNIT 2 - 2L32
- - UNIT 5 - 3L32
- - UNIT 2 - 2CR56
- - UNIT 5 - 2CR56

CERTIFIED AS BUILT

SAN ONOFRE UNITS 2 & 3

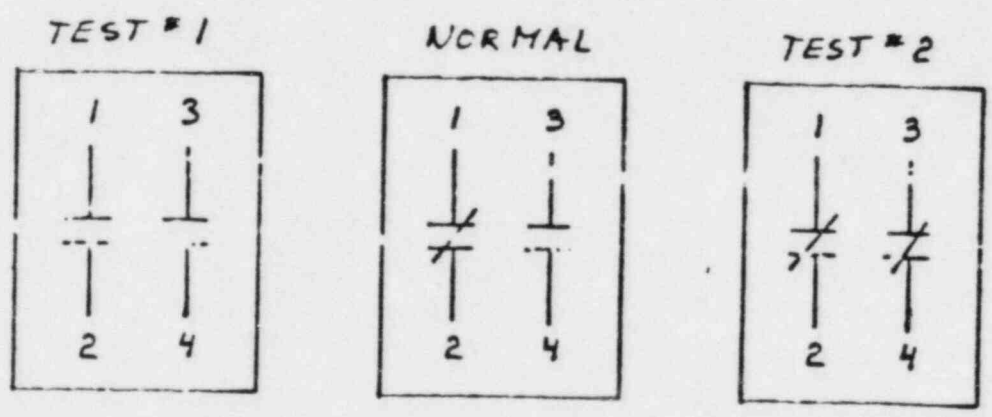
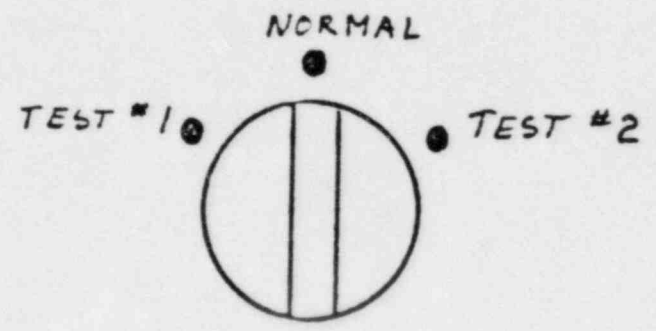
UNIT ELECTRIC CONTROL, INC.
ORLANDO, FLORIDA

UNIT 2 - 2L32 UNIT 5 - 3L32 UNIT 2 - 2CR56 UNIT 5 - 2CR56	DATE: 6-10-75 SCALE: 1/8" = 1" DRAWN: J. H. H. CHECKED: J. H. H. SHEET NO: 1 DRAWING NO: 8052-B5.3
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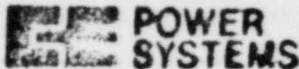
REV NO	DATE	DESCRIPTION
3	1-12-76	REV PER CE COMMENTS - PAR. 9
2	12-5-75	ADDED EXT. CON. PER CUST. INFO
1	9-27-75	REV PER CUST. MND. DNG. DATED 9-24-75

7/8/79
 5/18/79
 5/18/79

SUGGESTED REF. DRAWING



TEST #1 UNDERVOLTAGE TRIP (CONTACTS #1 AND #2)
TEST #2 SHUNT TRIP COIL TRIP (CONTACTS #3 AND #4)



S-CE-7224

(5)

January 25, 1982
Southern California Edison Co.
San Onofre Units 2 & 3
SCE Order No. N1800001
Bechtel Job No. 10079
C-E Contracts 1370 & 1470
S-IPE-4060

Copy: C. Hoppes
Discussed with Larry Caldwell
2/10/82... Don't have 18 nor have 31
days... We have procedure to accomplish
w/o listing leads.

Mr. D.E. Nunn, Project Manager
San Onofre Units 2 & 3 Project
Southern California Edison Co.

Subject: Surveillance Testing of Reactor Trip Circuit Breaker

Reference: (A) SCE to CE Letter dated December 3, 1981, same subject ✓

Dear Mr. Nunn:

Reference (A) noted that the present design of the reactor trip circuit breaker does not permit independent actuation of the undervoltage trip and the shunt trip devices during normal surveillance testing. CE was requested to implement a design change to provide independent testing of these trip devices.

CE has reviewed the reactor trip circuit breaker design and has developed a procedure to accomplish independent testing of these trip devices compatible with the present design. This procedure is to be performed during a refueling outage; hence the independent testing is conducted every 18 months as required by the San Onofre Unit 2 Technical Specification, Table 4.3-1. Therefore, a design modification is not necessary. Normal surveillance testing will continue to test operability of the circuit breaker.

--- 31 MAY 72 57

The procedure for independent testing of the shunt and undervoltage trip devices is as follows:

Prerequisites

1. Perform during a refueling outage.
2. Rack the circuit breaker out to the test position. This will remove the remote closure switches from operability and enter a test trip switch in the shunt trip circuit. Close the circuit breaker.

Method

1. Test the shunt trip by actuation of the test pushbutton. The breaker will trip, but only because of shunt trip actuation. Reclose the breaker.

RECEIVED
FEB 2 1982
C.O. HOPPES

2. Test the undervoltage trip device by removal of the trip circuit control fuses. The breaker will trip, but only because of the undervoltage trip device actuation.

3. Replace the fuses and rack in the circuit breaker.

If you have any questions, please do not hesitate to ask.

Sincerely,

COMBUSTION ENGINEERING, INC.

V.C. Hall

V. C. Hall
Project Manager

YCH DW

S-112-4064

cc: C. Diles *CD*
R.L. Rogers (Berntel)
W.L. MacDonald (C-E Irvine)
H. Peters (SOGBC)
D.E. Smith (SCE)
H. Richter (SCE)
F.M. Bockhorst (C-E)

March 12, 1982

MR. H. L. RICHTER

SUBJECT: Units 2/3 Reactor Trip Breakers

References: Attached:

- (1) Letter Katz to H.B. Ray (Sept. 29, 1981)
- (2) Log Assignment
- (3) Startup Problem Report
- (4) Letter: Hall (CE) to J.G. Haynes (May 27, 1981)
- (5) CE Quarterly Report (March, 1981)

In response to the referenced documents, we have initiated a procedure to verify the undervoltage and shunt trip circuits on a 31 day basis, along with additional procedures that verify breaker tripping from either source on the same frequency.

However, Technical Specification Table 4.3-1 Note (12) (Page 3/4 3-12) states "At least once per 18 months and following maintenance or adjustment of the reactor trip breakers, the channel functional test shall include independent verification of the undervoltage and shunt trips."

Please determine if it is necessary for us to continue the 31 day testing of the undervoltage and shunt circuits, since these tests do appear to overexcerize the breakers unnecessarily if not required. We understand that CE has issued some additional information recently that conflicts with their previous recommendation.

Your rapid resolution of this problem will be appreciated.

Brian Katz
B. KATZ

Attachments

WHRay/mds

cc: H.B. Ray
L. Mueller
T. Graham
W.C. Moody/P.A. Croy
Engineering Files
CDM Files

April 12, 1982

B. Katz
RECEIVED ⑦
APR 19 1982
B. KATZ

MR. H. L. RICHER

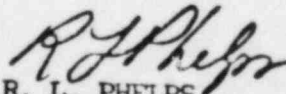
SUBJECT: Surveillance Testing of the Reactor Trip Breakers
San Onofre Nuclear Generating Station
Units 2 & 3

- References:
- (1) SONGS 2/3 NCR S023-P-152, dated 3/25/82
 - (2) Log Assignment HLR-792, dated 3/17/82
 - (3) Log Assignment HLR-635, dated 2/1/82
 - (4) SONGS 2/3 Instrument and Test Procedure S023-II-11.161
 - (5) SONGS 2/3 Technical Specification 3/4.3

The following conclusions are offered as resolution to the question of reactor trip breaker testing procedures:

- a) Malfunctioning reactor trip breakers (NCR P-152) have been examined by vendor representatives. Appropriate corrections and adjustments have been completed, which should be the permanent fix.
- b) Replacement of the push-buttons with spring-loaded switches in the undervoltage and shunt trip circuits (SPR, 9/26/81) is a convenience for test personnel which is unnecessary at this time. Since no hazard has been identified and testing is infrequent, a diversion of efforts would not be justified.
- c) The 18-month schedule (Tech. Spec. 3/4.3) for independent verification of the undervoltage and shunt trips of the reactor trip breaker circuits is adequate. Station Procedure S023 II-11.161 should be revised from 31-day intervals to 18-month intervals, thus coinciding with the technical specification. Tests for two consecutive months would be appropriate to verify the adequacy of the vendors adjustments to the reactor trip breakers. If requested to do so, Tom Graham of Electrical Test will conduct the tests on an informal basis.

If I can be of further assistance, please call me.


R. L. PHELPS

RCDavis:aa

cc: C. O. Hoppes
D. W. Casey
S. D. Root
NE Files

April 12, 1981

RECEIVED
APR 19 1982
KATZ

MR. B. KATZ

SUBJECT: Surveillance Testing of the Reactor Trip Breakers
San Onofre Nuclear Generating Station
Units 2 & 3

RECEIVED
MAY 6 1982
R.N. SANTOSUOSSO

Reference: (1) Memo to H. L. Richter from B. Katz, dated 3/12/82
(2) SONGS 2/3 Instrument and Test Procedure SO23-II-11.161
(3) SONGS 2/3 Technical Specification 3/4.3

Your memo of March 12, 1982 and the procedures related to the surveillance testing of the reactor trip breakers have been reviewed.

Please revise Procedure SO23-II-11.161 to an 18-month schedule which will then coincide with Technical Specification 3/4.3. Electrical Test is also being requested to conduct supplemental surveillance tests for two consecutive months. These tests will be done on an informal basis to verify results of vendors adjustments to the breakers (NCR P-152).

H. L. Richter

H. L. RICHTER

PCDavis:aa

cc: R. L. Phelps
C. O. Hoppes
T. Graham
S. D. Root
W. C. Moody
CDM Files

March 14, 1983

MR. A. E. CHAFFEE

SUBJECT: Processing of IE Bulletin 79-09 and
IE Circular 81-12

The attached documents describe the processing of IE Bulletin 79-09 and IE Circular 81-12 by SCE for Units 2 and 3.

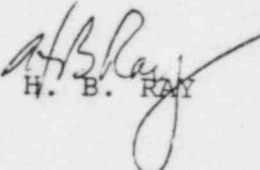
1. SCE letters to CE and Bechtel dated 5-7-79 refer to IEB 79-09, which was received 4-20-79 by SCE, and request information required for SCE to prepare a response.
2. 5-22-79 letter from Bechtel to SCE indicating that GE AK-2 circuit breakers are not included in their area of responsibility.
3. 6-8-79 letter from CE to SCE indicating that GE AK-2 circuit breakers are used in trip switchgear and recommending that SCE follow the GE recommended corrective action.
4. 6-13-79 letter from SCE to NRC responding to IEB 79-09. It reflects SCE's intent to replace the trip switchgear following issuance of a rule concerning ATWS by NRC. At that time, such a rule was expected shortly. Until the switchgear was replaced, preventative maintenance would be in accordance with item 3 of IEB 79-09.
5. 6-14-79 letter from project engineering to operations indicating that the preventative maintenance should be developed in accordance with 4. above.
6. 7-27-79 NCR SO23-F-216 which was initiated in accordance with 4. above to require development and use of the preventative maintenance plan pursuant to IEB 79-09 or replacement of the switchgear. It was closed based on issuance of MPES-008 on 6-6-80. (The parallel Bechtel NCR issued to track this same item is also attached.)

MR. A. E. CHAFFEE

-2-

March 14, 1983

7. 10-26-79 NRCAIR Number F-NRC-154 which was opened based on 4. above to assure that IEB 79-09 was reflected in startup maintenance procedures. It was closed 7-1-81 by reference to MPES-008 and NRC Inspection Report 50-361/81-07.
8. 7-28-81 letter from QA Manager to Manager of Nuclear Engineering, Licensing and Safety, and distribution, forwarding IEC 81-12 for information.
9. 10-19-82 memorandum for file documenting review of IEC 81-12 by the Station. The author of this memo has stated that the procedural reference is incorrect as written. He did review S023II-11.161; not S023-3-2.19.1 as indicated.


H. B. RAY

HBR:jkb

cc: J. M. Price
CDM File

May 7, 1979

Mr. R. L. Rogers
Project Engineer
Bechtel Power Corporation
P. O. Box 60860, Terminal Annex
Los Angeles, California 90060

Dear Mr. Rogers:

Subject: IE Bulletin 79-09
San Onofre Nuclear Generating Station
Units 2 and 3

Attached for your action is IE Bulletin 79-09, "Failures of GE Type AK-2 Circuit Breakers in Safety Related Systems". Please review the information contained therein so that we have sufficient time to prepare our response regarding any preventative maintenance program which might be necessary (per Bulletin Item 3), and inform us as to whether or not the subject breakers are utilized (regardless of safety classification of system) at San Onofre by May 21, 1979. Additionally, by June 4, 1979 identify those systems utilizing the subject breakers and Bechtel's plans to ensure the breakers receive the recommended corrective action (per GE service alert letter No. 175 (CPDD) forwarded with bulletin) prior to plant operation.

To expedite this matter, a copy of the subject bulletin has already been forwarded to your Mr. Robert Schilling. Should you have any questions or require further clarification, please contact Mr. Chane Balog of our Nuclear Engineering Section.

Very truly yours,

D. F. Martin

D. F. Martin
Project Engineer

bcc: H. B. Ray/S. V. Tashjian
D. E. Nunn
A. Marr
D. F. Pilmer/W. G. Zintl (w/o att.)
C. K. Balog (w/o att.)
B. Katz/J. Silvio (2) (w/o att.)
NE File
EDM Files

CKB
CKBalog:mbw
Attachment

WJ
cc: R. L. Rogers (2)
R. W. DeVane, Jr. (CE-3) (w/o att.)
W. L. MacDonald (CE-Irvine) "
H. Peters (SEGSE) "

DJP
OK

RECEIVED

MAY 23 1979

H. B. RAY

CK Baloy

Bechtel Power Corporation (2)

Engineers - Constructors

12400 East Imperial Highway

Norwalk, California 90650

MAIL ADDRESS

P O BOX 60860 - TERMINAL ANNEX, LOS ANGELES, CALIFORNIA 90060

TELEPHONE (213) 864-4311



May 22, 1979

Log BE-4584

AD12-036

Scngs 2/3

Mr. D. F. Martin, Project Engineer
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Subject: San Onofre Nuclear Generating Station, Units 2 & 3
Bechtel Job 10079
IE Bulletin No. 79-09
File: S023-703-F

Reference: (A) SCE to Bechtel letter, Log EB-12738, dated 5-7-79,
Subject: IE Bulletin 79-09

Dear Mr. Martin:

General Electric Type AK-2 circuit breakers with the integral under-voltage trip device (Reference (A)) are not utilized on Bechtel procured equipment. There are no plans for utilization of this component in pending systems at this time.

If you have any questions, please contact us.

Very truly yours,

BECHTEL POWER CORPORATION

J. B. Hooper for

R. L. Rogers
Project Engineer
Los Angeles Power Division

DM:dv

cc: Mr. H. B. Ray, SCE ✓

RECEIVED)

MAY 23 1979 179

EDM/GO

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

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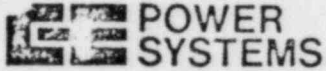
JUN 11 1979

S. V. TASHJIAN

June 8, 1979

S-CE-5571

Southern California Edison Company
San Onofre Units 2 and 3
SCE Order No. N1800001
Bechtel Job No. 10079
C-E Contracts 1370 and 1470



Log to BKok
① Plus coordinate a review
② Assume that GE recommendation
is incorporated in procedures
advise if any problems
Done 7/13/79
SVI

Mr. S. V. Tashjian
Project Management Engineer
San Onofre Units 2 and 3 Project
Room 353 - General Office
Southern California Edison Company
P. O. Box 800
Rosemead, CA 91770

Subject: IE Bulletin 79-09

- Reference: (A) S. V. Tashjian to R. W. DeVane, May 7, 1979,
Same Subject
- (B) C-E Letter S-CE-3030 dated July 8, 1976,
Reactor Trip Switchgear Technical Manuals

Dear Mr. Tashjian:

C-E has reviewed the subject bulletin forwarded by Reference (A) and advises that GE relays Type AK-2 are used in the C-E supplied reactor trip switchgear.

C-E recommends that SCE perform the GE recommended corrective action in their service alert letter No. 175 as a part of the SCE plant preventative maintenance program.

For specific guidance, see the instruction manual forwarded by Reference (B).

Very truly yours,

R. W. DeVane, Jr.
Project Manager

RWD:RCG/agl

- cc: R. L. Rogers (Bechtel)
- H. Peters (SDG&E)
- W. L. MacDonald (C-E Irvine)
- S. S. Salwach (C-E San Clemente)

RECEIVED
JUN 11 1979

EDM/GO

(4)

SCE

Southern California Edison Company

P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN
MANAGER, GENERATION ENGINEERING

June 13, 1979

TELEPHONE
213-572-1401

U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 N. California Boulevard
Walnut Creek, California 95696

Attention: Mr. R. H. Engelken, Director

Gentlemen:


Subject: IE Bulletin 79-09
Docket No's 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

Reference: McGill, P.O. (CE) to Rusche, B. C. (NRC),
Anticipated Transients Without SCRAM,
Combustion Engineering letter dated
June 30, 1976

Your letter of April 17, 1979 forwards IE Bulletin 79-09, "Failures of GE Type AK-2 Circuit Breakers in Safety Related Systems" and requests identification of those systems, if any, that utilize the subject breakers and plans for developing a preventative maintenance program to assure breaker design performance.

Following a review by both our NSSS supplier (CE) and our A/E (Bechtel), it has been determined that GE Type AK-2 breakers are utilized only in the Reactor Trip Switchgear. However, as stated in Section 15.8 of the San Onofre Units 2 & 3 FSAR, it is SCE's intent to implement a design change for ATWS similar to that described in the referenced letter. As part of that change the Reactor Trip Switchgear would be replaced and, therefore, none of the subject breakers would be utilized at San Onofre Units 2 and 3.

Dupe of ~~7908070739~~



June 13, 1979

Should those proposed modifications pertaining to the Reactor Trip Switchgear not be implemented for some reason, SCE will develop an appropriate preventative maintenance program (structured in accordance with the requirements of item 3 of the subject bulletin) prior to plant operation.

Should you have any questions or require further clarification, please contact me.

Very truly yours,

K. P. Baskin
Manager, Generation Engineering

CKBalog:lmd

cc: U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, D. C. 20555

bcc: Jack B. Moore
D. R. Pigott (Chickering & Gregory)
D. W. Gilman (SDG&E)
D. E. Nunn
H. B. Ray/D. F. Martin/S. V. Tashjian
H. L. Ottosen
J. M. Curran
J. A. Beoletto
W. C. Moody
M. O. Medford
C. K. Balog
D. F. Pilmer/W. G. Zintl
B. Katz/J. Silvio (2)
G. T. McLandrich
NE Files
NRC Files
EDM Files
B.L. Curtis

Correspondence: Bull. 79-09			
Date: 6/13/79			
	CR&Ad	Initials	Date
	Mgr. EDO		
✓	Mgr. GES		
✓	Chief, Nucl.	JL	6/14/79
✓	Supv., Lic.	WGA	6/14/79
✓	Lic. Gr. Ldr.	WGA	6/14/79
	Proj Mgr.		
✓	Proj. Engr.	CGM	6/14/79
✓	STE, Supr	WJY	6/14/79
✓	Law	WJY	6/14/79
	Power	CGM	6/15/79
	Qual		
	Env.		
✓	Proj. GL	BK	
✓	Tech GL	KZ	6/13/79
✓	orig	CB	6/13/79

(5)

June 14, 1979

MR. G. T. McLANDRICH

Subject: IE Bulletin 79-09
San Onofre Nuclear Generating Station
Units 2 and 3

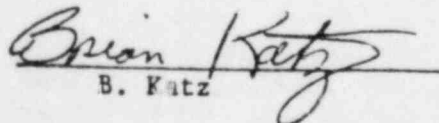
Reference: A. Letter K. P. Baskin to R. H. Engelken (NRC)
dated June 13, 1979, same subject (attached)

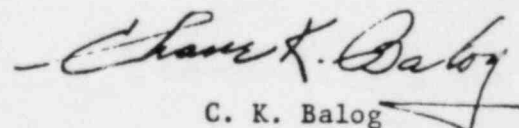
B. IE Bulletin 79-09 (attached)

IE Bulletin 79-09, "Failures of GE Type AK-2 Circuit Breakers in Safety Related Systems" requests identification of those systems, if any, that utilize the subject breakers and plans for developing a preventative maintenance program to assure breaker design performance.

The referenced letter informs the NRC that the subject breakers are utilized only in the Reactor Trip Switchgear (RTS) at San Onofre Units 2 and 3. Further, based on the information contained in FSAR Section 15.8, it is SCE's intent to implement certain design changes for ATWS considerations which include replacing the existing RTS (including the subject breakers); thus, SQ23 will no longer utilize the type AK-2 breakers and no further action in regard to this bulletin will be required. These modifications will be made providing NRC approval of Combustion Engineering's proposed ATWS modifications. However, should the proposed modifications not be implemented for some reason, Steam Generation should develop an appropriate preventative maintenance program (structured in accordance with the requirements of item 3 of Reference B) prior to plant operation. We will apprise you of the status of this concern when the NRC provides some indication of their position on the proposed ATWS modifications.

Should you have any questions or require further clarification, please contact me.


B. Katz


C. K. Balog

CKB:js

cc: S. V. Tashjian/D. F. Martin
B. L. Curtis
A. Marr
C. G. Moore
D. F. Pilmer/W. G. Zintl (w/o att.)
C. K. Balog (w/o att.)
B. Katz/J. Silvio (2) (w/o att.)
NE File (w/o att.)
EDM Files (w/o att.)

Project

NONCONFORMANCE REPORT (NCR) TO: ALEX CHAN
SONGS 2 & 3 G.O. 7 RM. 169

6

I. NUMBER
SO23 F-216
REV. 0

2. UNIT 2 & 3	3. ITEM DESCRIPTION GE Type AK-2 Circuit Breakers	4. "Q" CLASS I	5. ASME CODE CLASS N/A	6. DATE 7/27/79
7. LOT/HEAT/SERIAL NO. N/A	8. ITEM LOCATION Jap Mesa - Warehouse "B"	9. CONTRACTOR/SUPPLIER Bechtel/Combustion Engrg		
10. P.O. / SPECIFICATION NO. 8023-944-50-2	11. DRAWING NO. & REV. 8023-944-33 thru 41-3	12. SYSTEM SBA Reactor Trip Swgr.	13. ASME AUTH. INSPECTION REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

14. DESCRIPTION OF NONCONFORMANCE

6

SEE PAGE TWO

Reference: (E) BPC N-551

QKH
13. QA ENGINEER /
J.K. Huey /
C. R. Horton
DATE

14. APPARENT CAUSE See NRC IE Bulletin 79-09	15. CORRECTIVE ACTION TO PREVENT RECURRENCE Follow preventative maintenance plan or replace breakers
---	---

17. SIGNATURE James A. Parent	TITLE ELEC. ENGINEER	DATE 10/26/79	18. SIGNATURE James A. Parent	TITLE ELEC. ENGINEER	DATE 10/26/79
----------------------------------	-------------------------	------------------	----------------------------------	-------------------------	------------------

19. DISPOSITION/COMMENTS

Y prepared JAP started program of 248
Conditional release for installation. A preventative maintenance will be implemented to comply with the requirements of IE Bulletin 79-09. It is presently planned to replace the Reactor Trip Switchgear with another system at the first refueling that will provide ATWS protection.

Telecom approval per R. Phelps 10-18-79 JAP 8/28/80

20. FIELD DISPOSITION
 REJECT REWORK
 REPAIR ACCEPT "AS IS"

21. DISPOSITION APPROVAL SIGNATURE, TITLE, DATE James A. Parent ELEC. ENGR. 10/26/79	22. CONCURRENCE N/A AUTHORIZED INSPECTOR DATE
---	--

W. Schmitt SC2 QA 10/30/79
R. Phelps NE 6/13/80
Don B. Schone FOR H.L. RICHTER 8/28/80

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE S. H. Chen 9-2-80 DATE	24. IPDR NO. Maintenance procedure MPES-008 was approved for issue on 6-6-80
---	---

25. OFFICIAL REVIEWER (NCR CLOSED) H.B. Ray DATE 9/8/80	26. DISTRIBUTION P.R. Belhumeur / SU QA File H.B. Ray D.R. Hart D.B. Schone / PARENTS J.E. Arnold / QA File C.K. Balog Sanderdr / BPC J.K. Huey C.R. Horton P.A. Croy / Site QA File	27. FOR DOCUMENTATION CONTROL CENTER USE H.B. Ray J.J. Wambold Site QA File H.L. Richter G.O. QA File D.B. Schone MTS H.C. Chan EDMC
---	--	---

Block 14

GE AK-2 Type circuit breakers, which are to be installed in the reactor trip switchgear, have been identified by the vendor as defective equipment. Nuclear Regulatory Commission (NRC) letter to Southern California Edison (SCE) (Attachment No. 1) dated April 17, 1979, which enclosed IE Bulletin No. 79-09, requires action either by design change or the incorporation of a preventative maintenance plan outlined in GE Service Alert Letter No. 175 (CPDD) 9.3 dated April 2, 1979. The Service Alert Letter provides direction to rectify the trip mechanism device for failure to actuate via an undervoltage condition. SCE letter to NRC (Attachment No. 2) dated June 13, 1979 commits to one of the two resolutions described above pending approval of the proposed modification of the Anticipated Transient Without Scram (ATWS) System. To date no finite plan has been developed to accommodate either commitment and the switchgear cabinet has been installed for receipt of subject breakers.

SEP 12 1979

(E)

NONCONFORMANCE REPORT

1A. NO. N-551 PAGE 1 OF 35

1C. UNIT 2/3 2. MO DAY YR 8/21/79 3. DRAWING NO. S023-944-33 4. ITEM DESCRIPTION GE Type AK-2 Circuit Breakers 5. ITEM LOCATION Top Mesa - Whse. "S"

6. CLASS I 7. STARTUP SYSTEM NO. SBA 8. SERIAL/PLANT TAG NO. N/A 9. CONTRACTOR SUPPLIER BPC/CE 10. HOLD TAG APPLIED 0000-ICE-3008 11. HOLD TAG APPLIED S023-944-S0-2 YES NO

12. INSPECTION CRITERIA/PLAN NO. NO. S023-944-33 13. SKETCH ATTACHED YES NO CLIENT ENG FLD

17. DESCRIPTION

18. REPORTED BY C. Storie 19. VALIDATED BY W. White 20. DATE 8-22-79 21. DATE 8-21-79

19. APPARENT CAUSE OF DISCREPANCY: No design change or a preventative maintenance plan.

22. FIELD ENGR DECISION USE-AS-IS

23. DISPOSITION COMMENTS INCORPORATE PREVENTATIVE MAINTENANCE PROGRAM AS OBTAINED IN GE SERVICE ALERT LETTER (SEE PAGE 16 OF 16 ATTACHED)

24. FIELD ENGINEERING REP W. White 25. DATE 8-22-79 26. APPROVALS: W. White 27. REVIEWED AND APPROVED: J. Brown 28. DATE 10/14/79

29. GAE FINAL REVIEW W. White 30. DATE 10/23/79 31. AUTHORITY N/A

32. RECOMMENDATION TO PREVENT RECURRENCE: RE-DESIGN

SIGNATURE W. White TITLE CPE DATE 9-22-79 SIGNATURE J. Brown TITLE N/A DATE 10/14/79

33. COMMENTS: SCE (L. Tipton) concerned with disposition in TN-7002 den 10-17-79

Southern California Edison Company **SCE**
 QUALITY ASSURANCE
 NRC ACTION ITEM REPORT

⑦

NRCAIR Number F-NRC-154
 Date of Original Issue 10-26-79
 Revision Number _____
 Date of Revision _____

ACTION ITEM DESCRIPTION (Include pertinent specification, QA Program requirement; identify reference documents and actions). I&E Bulletin 79-09 - G-E Type AK-2 Breakers

By letter from K. P. Baskin to R. H. Engelken (NRC) dated 6-13-79, two options were presented to resolve the conditions described in the Bulletin. These options are: (1) Replacement of Reactor Trip Switchgear as part of ATWS design change thereby eliminating use of the subject breakers or (2) development of preventative maintenance program in accordance with item 3 of the Bulletin prior to plant operation if item (1) is not implemented by this time. Reference SCE NCR 5023-F-216 and BPC NCR N-551.

REQUIRED ACTION (Identify organization and individual responsible for taking action or providing information for answer to NRC question or concern. Give target date for completion of action).

SCE Startup Maintenance (R. Gray) to assure that preventative maintenance program is established for the breakers based on the disposition of the above NCR (option 2 above).

J. K. Huey
ASSIGNED GAB

Paul A. Croy
 P. A. Croy
QA / GAB SUPERVISOR

31 Oct 79
DATE

RESOLUTION (Describe actions, list reports, meeting, agreements, letters).

Preventive Maintenance Procedure No. MPES-008 has been developed. This item was closed by NRC Inspection Report No. 50-361/81-07.

B. I. Sanano
 B. I. Sanano
ASSIGNED GAB

6/30/81
DATE

D. C. Stonecipher
 D. C. Stonecipher
QA / QC SUPERVISOR

7-1-81
DATE

NRC ACTION

- Infraction
- Deficiency
- Deviation
- Ops: Item
- Unresolved item
- Inquiry/concern
- NA

PROJECT ACTION

- 10CFR50.55(e)
- 10CFR21
- SAR dev/chg
- NA

10CFR50 APP 'B' CRITERIA

- General XIII
- Specific XIII

DISTRIBUTION

- | | | | |
|---------------|---------------------|----------------|--------------------------|
| J. J. Wambold | D. B. Schone | L. L. Seyler | R. L. Rogers |
| H. B. Ray | T. O. Gray | C. K. Balog | SQAF (Orig. when issued) |
| D. E. Nunn | D. C. Stonecipher | L. A. Pfandler | (Copy when closed) |
| H. L. Richter | C. R. Horton | MTS | CDMC (Orig. when closed) |
| H. E. Morgan | <u>B. I. Sanano</u> | | |

AD12-IE
SONGS 1
SONGS 2/3

July 28, 1981

MR. K. P. BASKIN

SUBJECT: NRC IE Circular No. 81-12: INADEQUATE PERIODIC
TEST PROCEDURE OF PWR PROTECTION SYSTEM
San Onofre Nuclear Generating Station, Unit 1 and
Units 2 and 3

Attached for your information and use is NRC IE
Circular No. 81-12. No written response to the NRC is required.



D. E. NUNN

LLSeyler:fm

Attachment

- cc: R. Dietch
- H. B. Ray
- H. L. Ottoson
- J. G. Haynes
- J. M. Curran
- J. A. Beoletto
- W. C. Moody
- D. K. Nelson
- B. L. Curtis
- C. K. Balog
- G. D. Bogosian
- P. A. Croy
- L. L. Seyler
- J. D. Dunn
- G. W. McDonald
- K. G. Grothues
- C. C. Coppin
- D. E. Nunn
- QA Files
- CDM Center

*talked to C. Hayes 9/3/81 -
will talk to Adams re:
action to be taken. Will
get back to me by Monday
9/7. efb*

Adams advised

MEMORANDUM FOR FILE

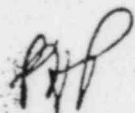
October 19, 1982

SUBJECT: SONGS 2/3 ISEG Investigation
I.E.C. 81-12 (NWS-35)
Inadequate Periodic Test Procedure of PWR Protection System

The subject I.E.C. 81-12, addresses a trip circuit breaker (TCB) malfunction which occurred at the St. Lucie Nuclear Power Plant as a result of inadequate maintenance.

The affected TCB's failed to trip on undervoltage due to a lack of lubrication and an improperly adjusted linkage. These conditions were not checked as part of the surveillance testing procedure which was in use at the time. St. Lucie has since modified its procedures to check operation of the TCB undervoltage trip as well as the shunt trips.

SONGS 2/3 Surveillance Test Procedure S023-3-2.19.1, CEDM MG SET OPERATION, presently tests the operation of the undervoltage and shunt trip coils separately. Based on the existing procedure no further action is necessary.



P. H. PENSEYRES
STA/ISEG Supervising Engineer

DKP
DKP:cag
Attachment

cc: W. W. Strom
B. Katz
D. Herbst
A. Yee
B. Woods
CDM Files

To Memorandum For File
From DK Powers
Date March 14, 1983
SUBS SONGS 2/3 ISEG Investigation
I.E.C. 82-12 (WWS-35)
Inadequate Periodic Test Procedure of PWR
Protection System

The reference to test procedure S023-3-2.19.1, CEDM
MG SET OPERATIONS, was an error introduced
at the time of drafting of the memo. As
indicated in the same paragraph it was
the test procedure which ~~which~~ was reviewed
and evaluated therefore the ~~the~~ memorandum
should be revised to reflect surveillance test
S023-II-11.161.

The conclusion drawn was then and now ~~is~~ ~~is~~ is
valid, based on ~~th^a~~ thorough and adequate
review

If there are any additional questions please contact
Danny K Powers

Danny K Powers
3/14/83

March 13, 1983

MR. A. E. CHAFFEE

SUBJECT: NRC Requested Documents
Elementary and One-Line Diagrams

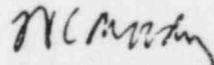
Enclosed are copies of the following documents requested by the NRC:

1. S023-944-4-4 Simplified Functional Diagram

2. S023-944-336-1 DC Elementary - TCB-9
3. S023-944-334-2 and DCN 1-VP DC Elementary - TCB-7
4. S023-944-335-2 and DCN 1-VP DC Elementary - TCB-8
5. S023-944-333-2 and DCN 1-VP DC Elementary - TCB-6
6. S023-944-332-2 and DCN 1-VP DC Elementary - TCB-5
7. S023-944-331-2 and DCN 1-VP DC Elementary - TCB-4
8. S023-944-330-2 and DCN 1-VP DC Elementary - TCB-3
9. S023-944-329-2 and DCN 1-VP DC Elementary - TCB-2
10. S023-944-328-1 and DCN 2-VP, 1-VP DC Elementary - TCB-1

11. S023-944-344-2 Wiring Diagram Section 05
12. S023-944-340-2 Wiring Diagram Section 01
13. S023-944-341-2 Wiring Diagram Section 02
14. S023-944-342-1 Wiring Diagram Section 03
15. S023-944-343-2 Wiring Diagram Section 04

The above items are provided in response to item III of the NRC-prepared agenda and item "III Electrical Schematic or Elementary Drawings," on the "Paper" attachment to the NRC-prepared agenda.


W. C. MOODY

1622v/jms

cc: H. B. Ray
J. M. Price
CDM files

March 13, 1983

MR. A. E. CHAFFEE

SUBJECT: NRC Requested Documents
Elementary and One-Line Diagrams

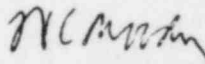
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4. S023-944-335-2 and DCN 1-VP DC Elementary - TCB-8
5. S023-944-333-2 and DCN 1-VP DC Elementary - TCB-6
6. S023-944-332-2 and DCN 1-VP DC Elementary - TCB-5
7. S023-944-331-2 and DCN 1-VP DC Elementary - TCB-4
8. S023-944-330-2 and DCN 1-VP DC Elementary - TCB-3
9. S023-944-329-2 and DCN 1-VP DC Elementary - TCB-2
10. S023-944-328-1 and DCN 2-VP, 1-VP DC Elementary - TCB-1

11. S023-944-344-2 Wiring Diagram Section 05
12. S023-944-340-2 Wiring Diagram Section 01
13. S023-944-341-2 Wiring Diagram Section 02
14. S023-944-342-1 Wiring Diagram Section 03
15. S023-944-343-2 Wiring Diagram Section 04

The above items are provided in response to item III of the NRC-prepared agenda and item "III Electrical Schematic or Elementary Drawings," on the "Paper" attachment to the NRC-prepared agenda.


W. C. MOODY

1622v/jms

cc: H. B. Ray
J. M. Price
CDM files