

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): **DIABLO CANYON UNIT 1** DOCKET NUMBER (2): **05000275** PAGE (3): **1 OF 4**

TITLE (4): **REACTOR TRIP DURING TESTING OF THE REACTOR TRIP SWITCHGEAR**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIA NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		
08	29	86	86	010	00	09	29	86			
									DOCKET NUMBER(S):		
									05000		
									05000		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (11)

OPERATING MODE (9): **1**

POWER LEVEL (10): **054**

10 CFR **50.73(a)(2)(iv)**

OTHER (Specify in Abstract below and in Text, NRC Form 356A)

LICENSEE CONTACT FOR THIS LER (12): **THOMAS A. NELSON, REGULATORY COMPLIANCE ENGINEER**

TELEPHONE NUMBER: **805595-7351**

AREA CODE: **805**

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14):

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15): MONTH **11** DAY **15** YEAR **86**

ABSTRACT (16)

At 1254 PDT, August 29, 1986, with the Unit in Mode 1 (Power Operation), a reactor trip and subsequent turbine trip occurred due to a reactor trip breaker inadvertently opening during testing. This testing was implemented as a result of LER 1-86-006, regarding problems experienced with an auto shunt trip test pushbutton. Reactor trip breaker A opened due to a loose termination in the reactor trip switchgear for the coil of the undervoltage shunt trip (auxiliary) relay. The loose termination resulted in contact being momentarily broken allowing the shunt trip to actuate while the Instrumentation and Controls technician was installing test leads. Diesel generator 1-1 started during the station electrical load transfer following the trip, but by design did not load.

The significant event notification required by 10 CFR 50.72 was complete at 1345 PDT, August 29, 1986.

Tailboard meetings were held by the Instrumentation and Controls and Electrical Maintenance Departments emphasizing the normal practices of switchgear maintenance. Electrical terminations on similar relays in the Unit 1 auxiliary relay rack and solid state protection system (SSPS) have been checked. The electrical terminations for the undervoltage shunt trip (auxiliary) relays of the Unit 2 and other Unit 1 reactor trip breakers were also checked. A similar loose connection was found on the Unit 1 undervoltage shunt trip auxiliary relay for the B reactor trip breaker. No additional loose terminations were found for Unit 2, but during lug screw tightness checks, a lug on the relay contacts was broken. The loose terminations have been tightened and the broken leg has been replaced.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (17)

I. Initial Conditions

The unit was in Mode 1 (Power Operation) at 54 percent power.

II. Description of Events

A. Event:

At 1254 PDT, August 29, 1986, with the unit in Mode 1 (Power Operation), a reactor trip (AB)(RCT) and subsequent turbine trip (TA)(TRB) occurred when a reactor trip breaker (JC)(BKR), 52RTA, opened while the shunt trip mechanism was being prepared for testing implemented as a result of LER 1-86-006 corrective actions.

The test involved connection of test instrumentation to the undervoltage shunt trip (auxiliary) relay (JC)(27) located in the reactor trip switchgear. While an Instrumentation and Controls technician was connecting a lead to a relay termination, the termination for the coil of the relay momentarily broke contact, causing the shunt trip to operate and the reactor trip breaker to open. The attached sketch (VI.C.) is a simplified drawing of the trip breaker undervoltage and shunt trip circuitry. The terminations for the coil and the test instrumentation connection were both on the same rotary relay, in close proximity to each other. Diesel generator (EK)(DG) 1-1 started during the station electrical load transfer following the trip, but by design did not load.

B. Inoperable structures, components, or systems that contributed to the event:

None

C. Dates and approximate times for major occurrences:

1. August 29, 1986, 1254 PDT: Event date
2. August 29, 1986, 1345 PDT: Significant event notification required by 10 CFR 50.72 completed.

D. Other systems or secondary functions affected:

None

E. Method of discovery:

The event was immediately apparent due to alarms and indications in the control room.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (17)

II. Description of Events (Cont'd)

F. Operator actions:

The operators followed the appropriate procedures and placed the unit in a stable condition in Mode 3 (Hot Standby).

G. Safety system responses:

1. The reactor trip breakers (JC)(BKR) opened.
2. The control rod drive mechanisms (AA)(DRIV) allowed the control rods to drop into the reactor.
3. The turbine (TA)(TRB) tripped.
4. Diesel generator (EK)(DG) 1-1 started but, by design, did not load.

III. Cause of Event

A. Immediate cause:

A loose termination on the coil of the undervoltage shunt trip auxiliary relay momentarily broke contact, allowing the reactor trip breaker to open.

B. Root cause:

The cause of the loose termination which resulted in the reactor trip and the additional loose termination found during corrective action investigation is indeterminate pending further investigation. During lug screw tightness checks performed as part of corrective actions a lug which connects the undervoltage shunt trip (auxiliary) relay contacts to their power lead for Unit 2 broke. The lug connection installation was reviewed and determined to be appropriate.

After investigations are complete, a supplemental LER will be issued to identify the root cause (if determined) of the loose terminations.

IV. Analysis of Event

Since all safety systems responded as designed, there were no adverse safety consequences or implications resulting from this event.



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TEXT (17)

V. Corrective Actions

1. Tailboard meetings were held by the Instrumentation and Controls and Electrical Maintenance Departments which emphasized the normal practices of switchgear maintenance and included routine tightening of terminations.
2. Electrical terminations on similar relays in the Unit 1 auxiliary relay rack and solid state protection system (SSPS) have been checked. The electrical terminations for the undervoltage shunt trip relays of the Unit 2 and other Unit 1 reactor trip breakers were also checked. One additional loose termination was discovered on the Unit 1 relay for the B reactor trip breaker.

No loose terminations were found on Unit 2, but a lug which connected the undervoltage shunt trip (auxiliary) relay contacts to their power lead broke during performance of lug screw tightness tests. The broken lug is considered to be an isolated incident.

The loose terminations have been tightened and the broken lug has been replaced.

VI. Additional Information

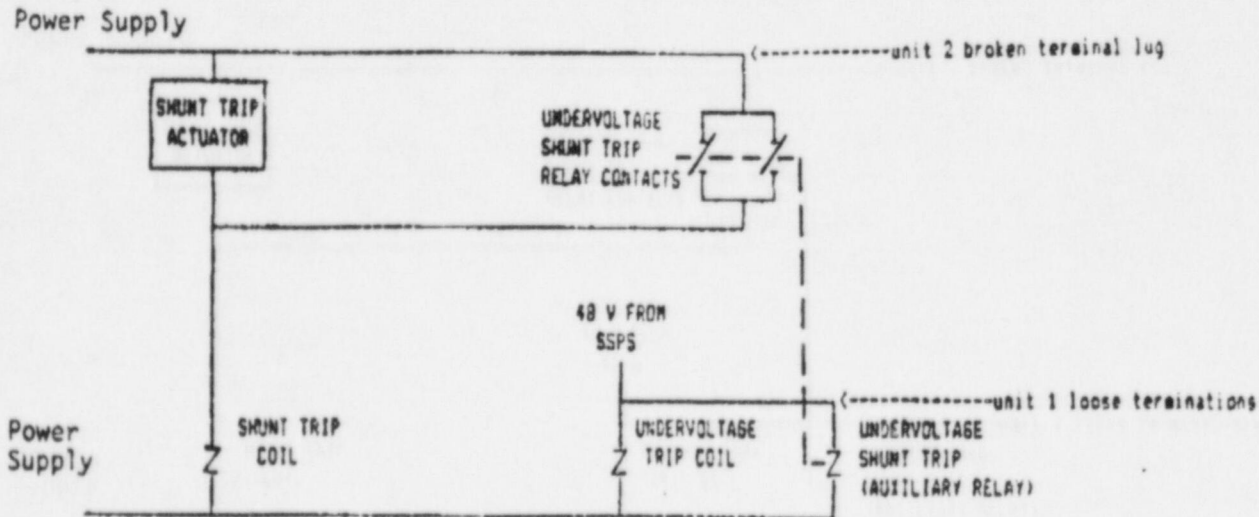
A. Failed components:

None

B. Previous LERs on similar events:

After determination of the root cause, previous LERs on similar events if any, will be identified in revision 1 of this LER.

C. Reactor Trip Breaker UV and shunt trip circuitry simplified schematic.



# PACIFIC GAS AND ELECTRIC COMPANY

PG&E

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JAMES D. SHIFFER  
VICE PRESIDENT  
NUCLEAR POWER GENERATION

September 29, 1986

PGandE Letter No: DCL-86-289

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80  
Diablo Canyon Unit 1  
Licensee Event Report 1-86-010-00  
Reactor Trip During Testing of the Reactor Trip Switchgear

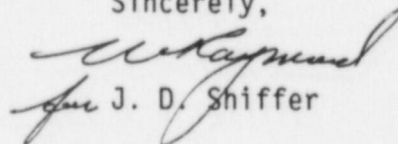
Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(iv), PGandE is submitting the enclosed Licensee Event Report concerning actuation of the reactor protection system during a reactor trip switchgear test.

This event has in no way affected the public's health and safety.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

  
for J. D. Shiffer

Enclosure

cc: L. J. Chandler  
J. B. Martin  
M. M. Mendonca  
B. Norton  
H. E. Schierling  
CPUC  
Diablo Distribution  
INPO

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