

# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>DIABLO CANYON UNIT 1</b>	DOCKET NUMBER (2) <b>0500002751</b>	PAGE (3) <b>OF 04</b>
--	--	--------------------------

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	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
08	29	86	86	010	01	11	25	86			050000

OPERATING MODE (9) <b>1</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (11)  <div style="display: flex; align-items: center;"> <input checked="" type="checkbox"/> 10 CFR <b>50.73(a)(2)(iv)</b>  <div style="margin-left: 10px; font-size: small;">             OTHER (Specify in Abstract below and in Text, NRC Form 366A)           </div> </div>
POWER LEVEL (10) <b>054</b>	

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
<b>THOMAS A. NELSON, REGULATORY COMPLIANCE ENGINEER</b>		<b>805595-7351</b>

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH DAY YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	

**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 completed 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 (see LER 2-86-024). The loose terminations have been tightened and the broken lug has been replaced.

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	COCKET NUMBER (2)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">LER NUMBER (6)</th> </tr> <tr> <td style="width: 33%;">YEAR</td> <td style="width: 33%;">SEQUENTIAL NUMBER</td> <td style="width: 33%;">REVISION NUMBER</td> </tr> </table>	LER NUMBER (6)			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
LER NUMBER (6)									
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
DIABLO CANYON UNIT 1	015000027586	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">-010</td> <td style="width: 33%;">-010</td> <td style="width: 33%;">2</td> </tr> </table>	-010	-010	2	OF 4			
-010	-010	2							

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), 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 connecting 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 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
DIABLO CANYON UNIT 1	015010027586	YEAR	SEQUENTIAL NUMBER
		REVISION NUMBER	PAGE (3)
		-010	-0103 OF 04

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 reactor trip breaker A to open.

### B. Root cause:

In addition to the loose termination on the relay for reactor trip breaker A which initiated this event, the investigation identified a similar loose termination on the undervoltage shunt trip (auxiliary) relay for reactor trip breaker B. Since the two loose terminations were both physically located on the same side of identical rotary relays in the same cubicle, and were installed as part of the same design change, the root cause is considered to be personnel error on the part of the construction contractor electrician.

## IV. Analysis of Event

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

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  DIABLO CANYON UNIT 1	DOCKET NUMBER (2)  0500027586	LER NUMBER (6) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">YEAR</th> <th style="width: 10%;">SEQUENTIAL NUMBER</th> <th style="width: 10%;">REVISION NUMBER</th> </tr> <tr> <td>86</td> <td>010</td> <td>0104</td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	86	010	0104	PAGE (3)  4 OF 4
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
86	010	0104							

TEXT (17)

## V. Corrective Actions

1. 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. Of approximately 1000 terminations checked, one additional loose termination was discovered on the Unit 1 relay for the B reactor trip breaker and no loose terminations were found on Unit 2. The two loose terminations have been tightened.
2. Although the two loose terminations are considered an isolated incident, 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.

## VI. Additional Information

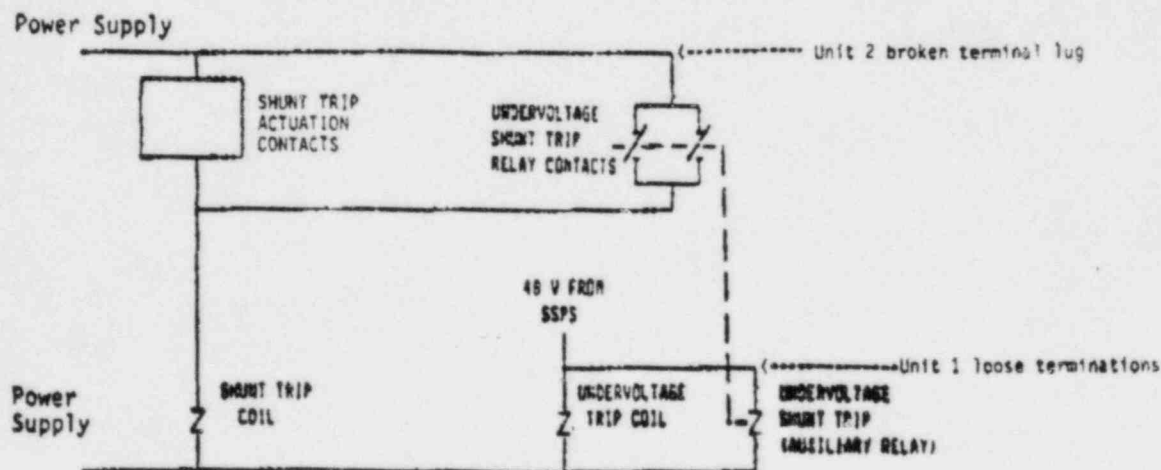
### A. Failed components:

None

### B. Previous LERs on similar events:

LER 1-85-030 "Low Low Steam Generator Level Reactor Trip." This event was caused by a loose termination on main feedwater pump 1-2 local manual trip button. Since no cause for the loose termination could be determined, and it was factory installed wiring, no permanent corrective actions were assigned.

### C. Reactor Trip UV and Shunt trip circuitry simplified schematic.



SIMPLIFIED SCHEMATIC REACTOR TRIP BREAKER UV AND SHUNT TRIP CIRCUITRY



# PACIFIC GAS AND ELECTRIC COMPANY

PG&E

77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6587

JAMES D. SHIFFER  
VICE PRESIDENT  
NUCLEAR POWER GENERATION

November 25, 1986

PGandE Letter No: DCL-86-343

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 1-86-010-01  
Reactor Trip During Testing of the Reactor Trip Switchgear

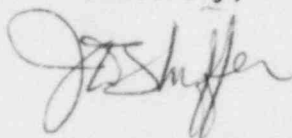
Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(iv), PGandE is submitting the enclosed Licensee Event Report revision concerning actuation of the reactor protection system during a reactor trip switchgear test. This revision is being submitted to report the results of the investigation on similar equipment on Unit 1 and Unit 2.

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,



Enclosure

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

1218S/0048K/RHM/481

DC1-86-TI-N100

IE22  
11