

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

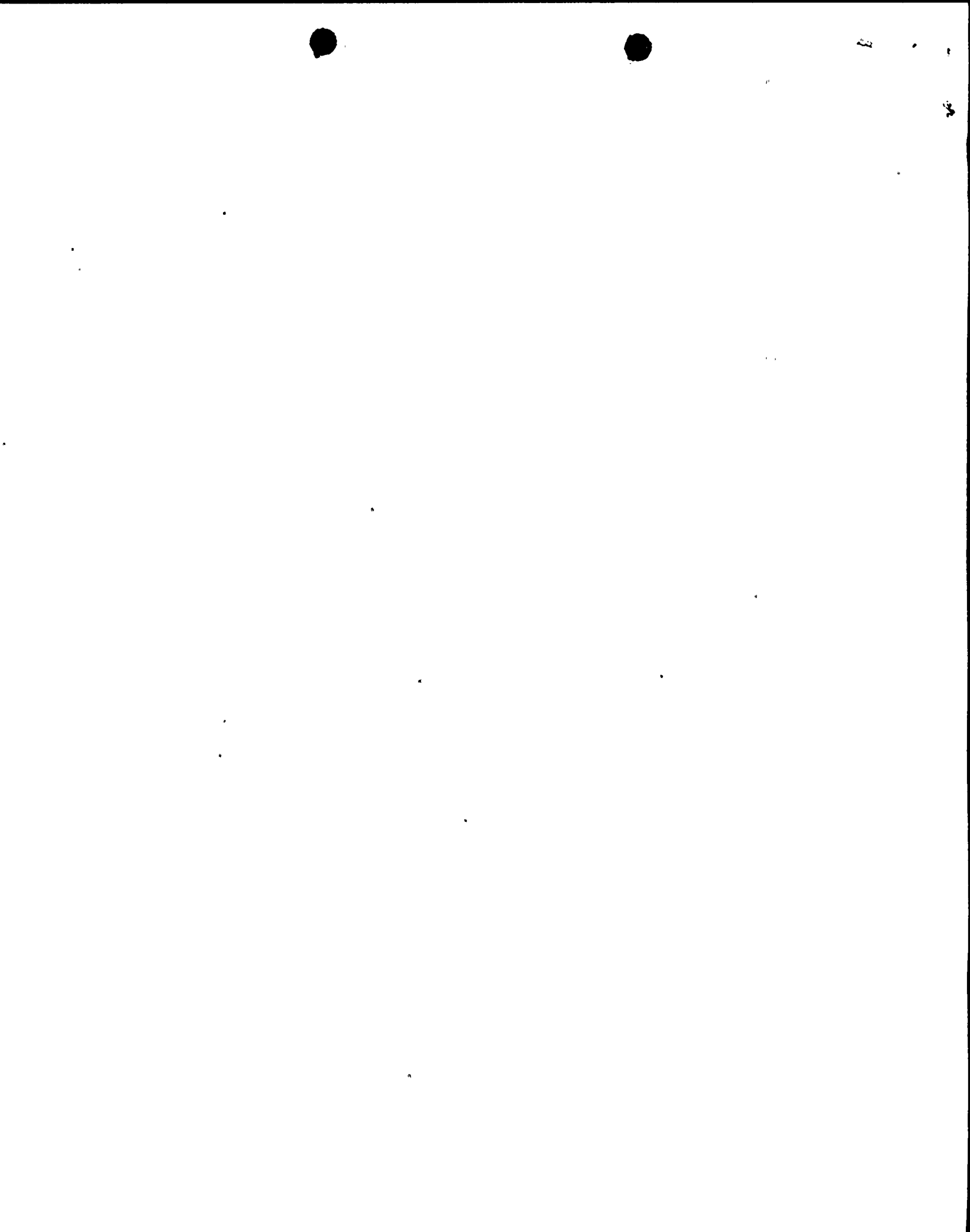
ACCESSION NBR: 8709180411    DOC. DATE: 87/09/14    NOTARIZED: NO    DOCKET #  
 FACIL: 50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Ga    05000323  
 AUTH. NAME                    AUTHOR AFFILIATION  
 WILSON, S. D.                  Pacific Gas & Electric Co.  
 SHIFFER, J. D.                Pacific Gas & Electric Co.  
 RECIP. NAME                    RECIPIENT AFFILIATION

SUBJECT: LER 87-019-00: on 870814, diesel generator (DG) 2-2  
 automatically started & loaded onto vital 4 kV Bus H. Caused  
 by short-circuited wire. Bus potential fuse & severed wire  
 replaced & vital bus aligned to offsite power. W/870914 ltr.

DISTRIBUTION CODE: IE22D    COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD5 LA	1 1	PD5 PD	1 1
	TRAMMELL, C	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADS	1 0
	NRR/DEST/CEB	1 1	NRR/DEST/ELB	1 1
	NRR/DEST/ICSB	1 1	NRR/DEST/MEB	1 1
	NRR/DEST/MTB	1 1	NRR/DEST/PSB	1 1
	NRR/DEST/RSB	1 1	NRR/DEST/SGB	1 1
	NRR/DLPQ/HFB	1 1	NRR/DLPQ/QAB	1 1
	NRR/DOEA/EAB	1 1	NRR/DREP/RAB	1 1
	NRR/DREP/RPB	2 2	NRR/PMAS/ILRB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGN5 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	2 2	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1



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

September 14, 1987

PGandE Letter No.: DCL-87-224

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

Re: Docket No. 50-323, OL-DPR-82  
Diablo Canyon Unit 2  
Licensee Event Report 2-87-019-00  
Autostart of Diesel Generator 2-2 Due to a Wire Being  
Broken During Reinstallation of a 4 kV Breaker

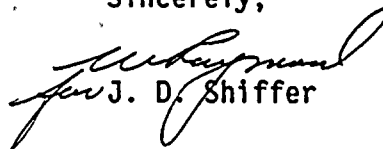
Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(iv), PGandE is submitting the enclosed Licensee Event Report concerning an inadvertent actuation of an engineered safety feature (automatic start of diesel generator 2-2).

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,

  
for J. D. Shiffer

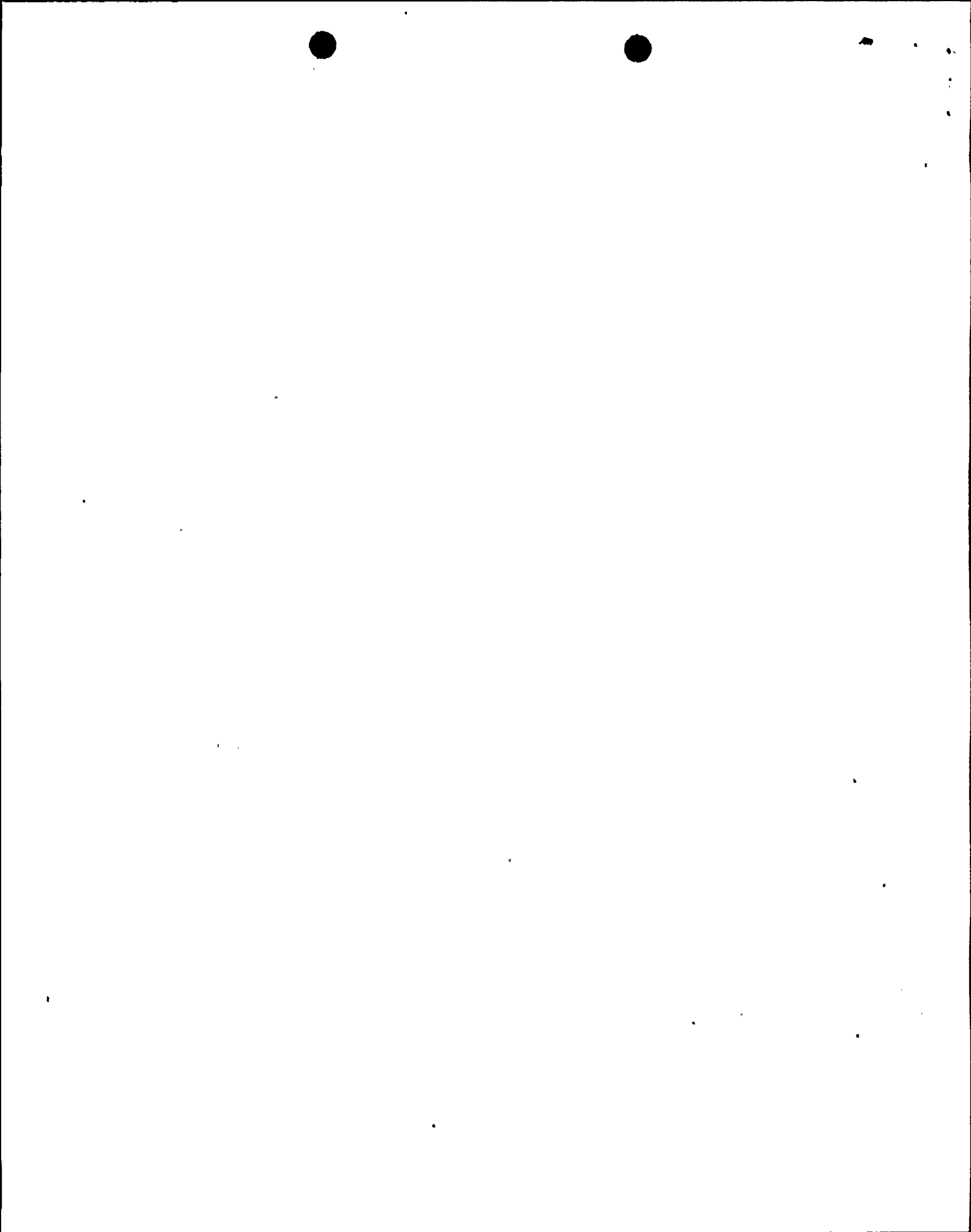
Enclosure

cc: L. J. Chandler  
J. B. Martin  
M. M. Mendonca  
P. P. Narbut  
B. Norton  
CPUC  
Diablo Distribution  
INPO

1668S/0051K/RHM/1628

DC2-87-EM-N096

1E22  
11



# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
DIABLO CANYON UNIT 2	05000323	1 OF 04

TITLE (4) **AUTOSTART OF DIESEL GENERATOR 2-2 DUE TO A WIRE BEING BROKEN DURING REINSTALLATION OF A 4KV BREAKER**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	SUBSON NUMBER	YEAR	MONTH	DAY	YEAR	FACILITY NAMES		
08	14	87	0119	010	09	11	14	87			
									DOCKET NUMBER(S)		
									05000323		

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

OPERATING MODE (9)  1

POWER LEVEL (10) 100

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

OTHER (Specify in Abstract below and in Text, NRC Form 385A)

LICENSEE CONTACT FOR THIS LER (12)

STEPHEN D. WILSON, REGULATORY COMPLIANCE ENGINEER	TELEPHONE NUMBER
	8105595-173511

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

CAUSE	SYSTEM	COMPONENT	MANUF. TUNER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUF. TUNER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If you complete expected submission date)      NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

**ABSTRACT (16)**

On August 14, 1987, at 2127 PDT, with Unit 2 in Mode 1 (Power Operation), diesel generator (DG) 2-2 automatically started and loaded onto the vital 4 kV bus H. The 4 kV breaker for component cooling water pump 2-3 was being reinstalled into its cubicle on vital bus H after maintenance. A wire associated with the vital bus undervoltage circuitry was short-circuited and severed by the mechanical action of installing the breaker. The short circuited wire resulted in an opened bus potential fuse and first- and second-level undervoltage relay actuation. These (second-level) relay actuations resulted in the automatic start and loading of DG 2-2, vital bus H stripping action and loading of DG 2-2 onto bus H, powering its 480 V loads. The effects of the opened bus potential fuse and the severed wire prevented the bus stripping signal from resetting. This prevented automatic or manual loading of the remaining 4 kV loads onto bus H.

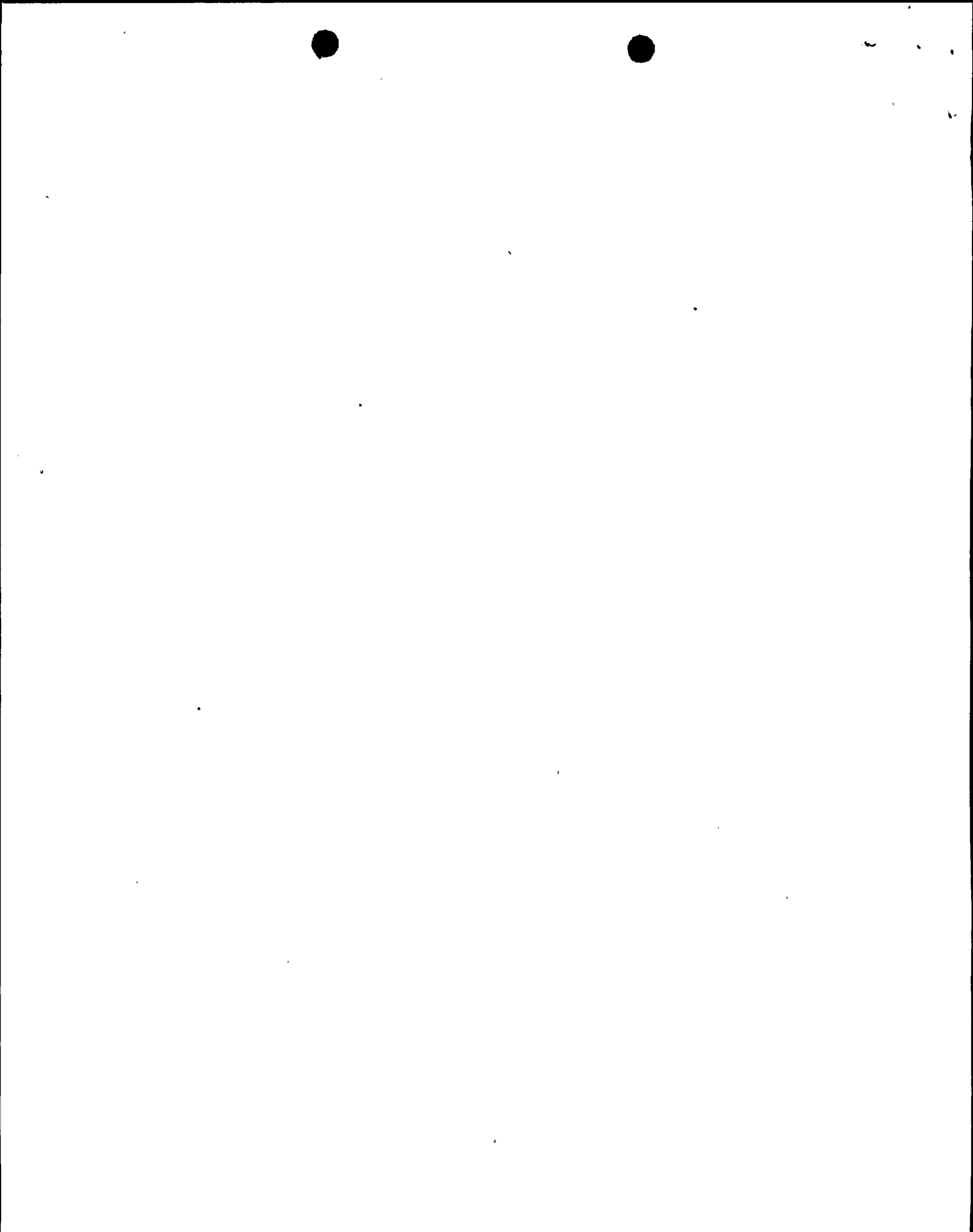
At 2307 PDT, the bus potential fuse was replaced, restoring operability to the remaining equipment on the bus. On August 15, 1987, at 0743 PDT, the severed wire was replaced, the vital bus aligned to offsite power, and DG 2-2 returned to its standby condition.

The notifications required by 10 CFR 50.72 were completed on August 15, 1987, at 0033 PDT.

The Electrical Maintenance Department inspected other breaker cubicles where similar undervoltage circuitry installations had been added. No other similar interference problems were identified.

1668S/0051K     8709180411     870914  
 PDR     ADOCK     05000323  
 S     PDR

*HE 22*



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  DIABLO CANYON UNIT 2	DOCKET NUMBER (2)  0   5   0   0   0   3   2   3	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8   7	-   0   1   9	-   0   1   0	0   2	OF 0   4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

I. Initial Conditions

The unit was in Mode 1 (Power Operation) at 100 percent power.

II. Description of Event

A. Event:

On August 14, 1987, at 2127 PDT, with Unit 2 in Mode 1, diesel generator (DG) 2-2 (EK)(DG) automatically started and loaded onto vital 4 kV bus H (EB)(BU). A licensed operator and an electrical maintenance technician were reinstalling the 4 kV breaker for component cooling water pump 2-3 on vital bus H into its cubicle after maintenance. A wire associated with the vital bus undervoltage circuitry was short-circuited and severed by the mechanical action of installing the breaker. The wire was located outside of a wire protective shield in the front area of the cubicle. The short-circuited wire resulted in an opened bus potential fuse and first- and second-level undervoltage relay actuation. These (second-level) relay actuations resulted in the automatic start and loading of DG 2-2, vital bus H stripping action, and loading of DG 2-2 onto bus H, powering its 480 V loads. The effects of the opened bus potential fuse and the severed wire prevented the bus stripping signal from resetting. This prevented automatic or manual loading of the remaining 4 kV loads onto bus H.

On August 14, 1987, at 2307 PDT, the bus potential fuse was replaced, restoring operability to the remaining equipment on the bus. The notifications required by 10 CFR 50.72 were completed on August 15, 1987, at 0033 PDT.

On August 15, 1987, at 0743 PDT, the severed wire was replaced, the vital bus aligned to offsite power, and DG 2-2 returned to its standby condition.

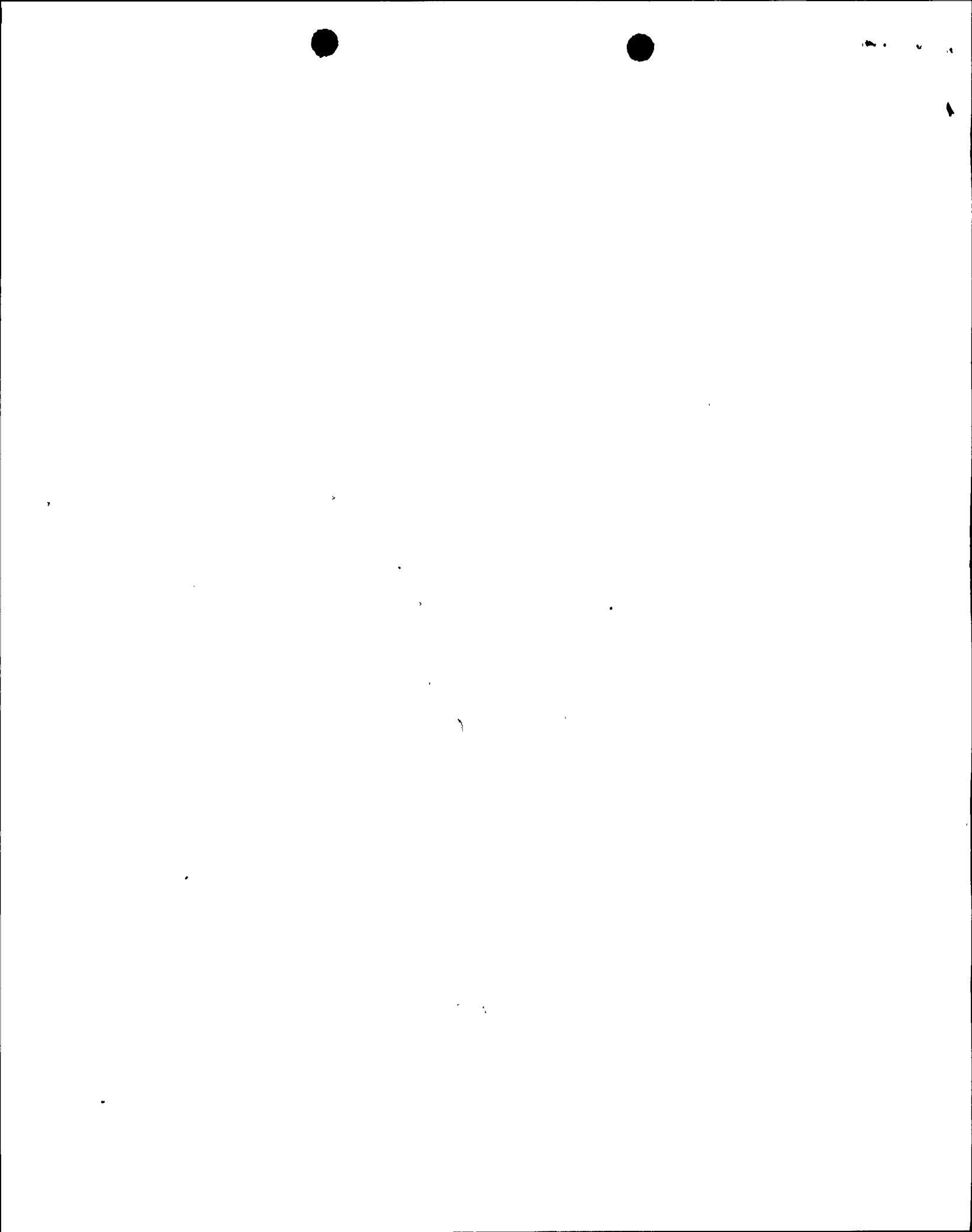
B. Inoperable structures, components or systems that contributed to the event:

None

C. Dates and approximate times for major occurrences:

1. August 14, 1987, at 2127 PDT: Event date - DG 2-2 autostarted when the 4 kV breaker was pushed into its cubicle after maintenance.
2. August 14, 1987, at 2307 PDT: The bus potential fuse was replaced.
3. August 15, 1987, at 0033 PDT: Notifications required by 10 CFR 50.72 were completed.

1668S/0051K





LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  DIABLO CANYON UNIT 2	DOCKET NUMBER (2)  0   5   0   0   0   3   2   3	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8   7	-   0   1   9	-   0   1   0	0   3	OF 0   4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

4. August 15, 1987, at 0743 PDT: The broken wire was repaired and diesel 2-2 was returned to its normal standby condition.

D. Other systems or secondary functions affected:

The opened bus potential fuse and the severed undervoltage protection wire resulted in DG 2-2 autostart, vital bus H stripping action, and the closing of DG 2-2 output breaker onto bus H. All 480 V vital bus H loads were powered by the DG.

However, the opened fuse and severed wire prevented the vital bus stripping relay from resetting. This resulted in a trip signal being present on breakers for the following equipment, rendering them inoperable:

- Containment spray pump 2-2
- Safety injection pump 2-2
- Residual heat removal pump 2-2
- Auxiliary feedwater pump 2-2

Component cooling water pump 2-3 was out of service for breaker preventive maintenance prior to the start of the event.

E. Method of discovery:

The event was immediately apparent in the control room due to alarms and to the operators involved in pushing the 4 kV breaker into its cubicle who heard the start of the diesel generator.

F. Operator actions:

No immediate operator action was required. Operators and maintenance personnel coordinated the subsequent troubleshooting.

G. Safety system responses:

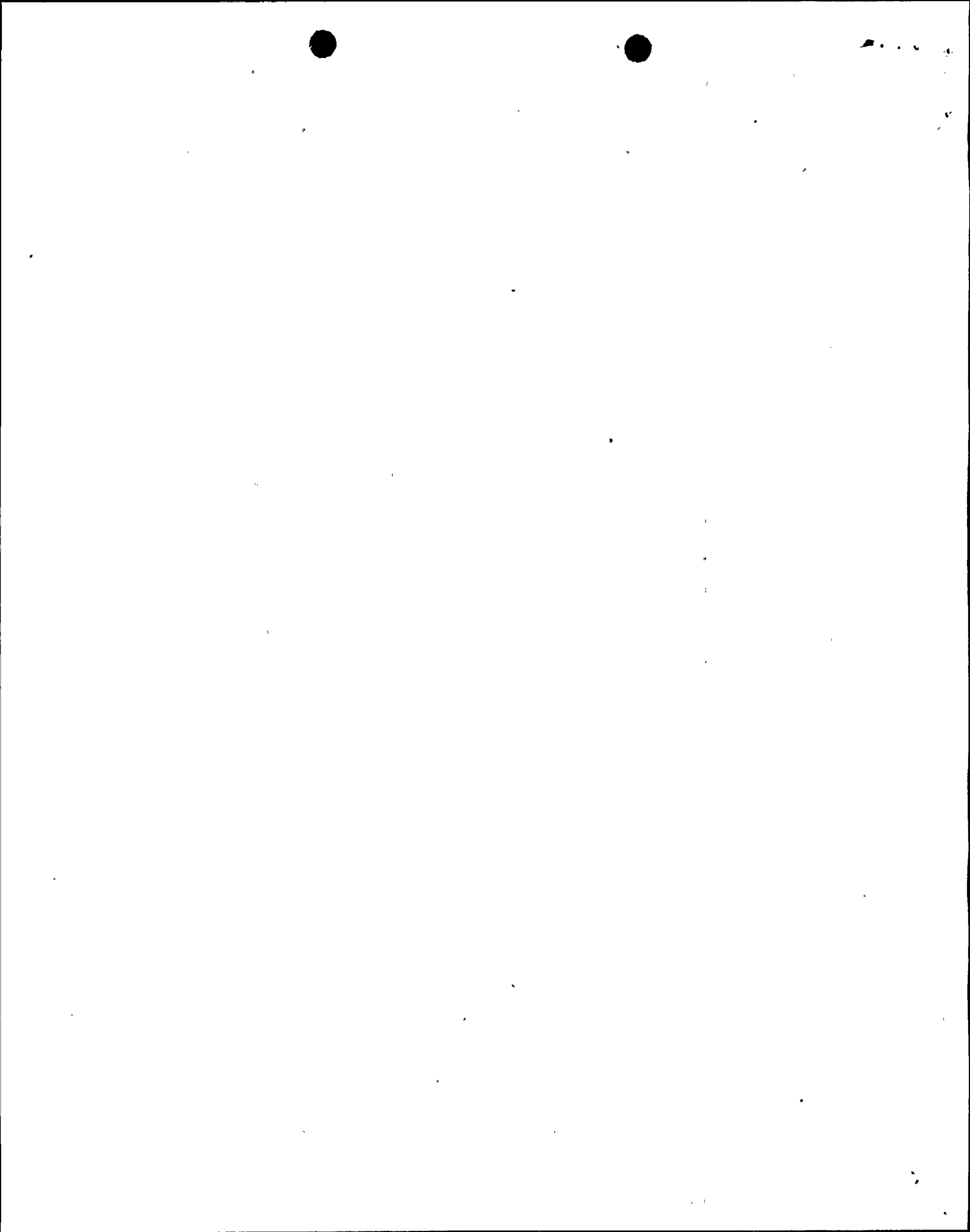
In response to the sensed undervoltage condition of 4 kV bus H, DG 2-2 started and subsequently loaded onto vital 4 kV bus H. Other equipment was not capable of automatic or manual loading onto the vital bus H because the effects of the opened bus potential fuse and the severed wire produced a vital bus stripping signal that could not reset.

III. Cause of Event:

A. Immediate cause:

Installation of the 4 kV breaker into its cubicle resulted in shorting and severing of a wire associated with the vital bus undervoltage protection circuitry.

1668S/0051K



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  DIABLO CANYON UNIT 2	DOCKET NUMBER (2)  0   5   0   0   0   3   2   3	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8   7	-   0   1   9	-   0   0	0   4	OF

TEXT (If more space is required, use additional NRC Form 368A's) (17)

B. Root cause:

The wire was not adequately protected, as it was installed outside of a wire protective shield. Also, procedures did not include instruction for breaker cubicle inspection for interferences prior to breaker installation in the cubicle.

IV. Analysis of Event:

Vital 4 kV bus H remained energized throughout the entire event. However, the containment spray pump, auxiliary feedwater pump, residual heat removal pump, and safety injection pump were prevented from starting for approximately 1 hour and 40 minutes, until the bus potential fuse was replaced. Throughout this time period, the other trains for the aforementioned pumps were available and capable of performing their intended safety functions. Thus, no adverse safety consequences or implications resulted from this event.

V. Corrective Actions:

1. The Electrical Maintenance Department inspected other breaker cubicles where similar undervoltage circuitry installations had been added. No other wiring was found outside of its protective shield.
2. The Operations Department will issue an incident report emphasizing the need for caution when pushing a 4 kV or 12 kV breaker into position.
3. The Electrical Maintenance Department will revise Maintenance Procedure (MP) E-63.1A, "Maintenance of 4 kV Magna-Blast Circuit Breakers," to include general instructions for breaker cubicle inspection for any interference with breaker movement.

VI. Additional Information:

A. Failed components:

None

B. Previous LERs on similar events:

1. LER 2-86-025, "Automatic Start of DG 2-2 Due to Personnel Error."

A diesel generator was started when a plant electrician inadvertently grounded a terminal while performing planned maintenance.

The corrective actions of LER 2-86-025 did not prevent the event described in LER 2-87-019 due to the differences in the root causes of the events.

1668S/0051K



1000

10

1000

1000

1000

1000

1000

1000

1000

1000

1000

1000

1000