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PG&E Letter DCL-11-078

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.73

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-2011-004-00
Emergency Diesel Generators Actuated Upon 230 kV Isolation Due to Maintenance Activities on Relay Panel

Dear Commissioners and Staff:

Pacific Gas and Electric Company submits the enclosed Licensee Event Report (LER) regarding the Diablo Canyon Power Plant Unit 1 emergency diesel generators actuation after 230 kV startup power was isolated due to an inadvertent relay actuation. This LER is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) and 10 CFR 50.73(a)(2)(v)(D).

There are no new or revised regulatory commitments in this report.

This event did not adversely affect the health and safety of the public.

Sincerely,

James R. Becker

dnpo/50402706
Enclosure
cc/enc: Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Alan B. Wang, NRR Project Manager
INPO
Diablo Distribution

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Diablo Canyon Power Plant Unit 1	05000 275	1 OF 5

4. TITLE

Emergency Diesel Generators Actuated Upon 230-kV Isolation Due to Maintenance Activities on Relay Panel

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
05	17	2011	2011	- 4 -	0	06	30	2011	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☑ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☑ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Thomas R. Baldwin, Manager, Regulatory Services	(805) 545-4720

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☑ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
09	15	2011

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On May 17, 2011, at 0954 PDT, with Unit 1 at approximately 100 percent power, 230 kV startup power was isolated following the actuation of the 230 kV Line Differential Relay 287. As a result, all Unit 1 emergency diesel generators (EDGs) started in standby mode as designed, with no problems observed. No vital loads were affected by the loss of startup power as they remained powered by the Unit 1 main generator. At the time, Unit 2 was in a refueling outage with the core offloaded and startup power cleared; therefore, it was unaffected by the event.

All Unit 1 EDGs were shut down and returned to auto, Startup Transformers 1-1 and 1-2 were returned to service, and on May 17, 2011, at 1125 PDT, Unit 1 startup power was declared operable.

On May 17, 2011, at 1542, Pacific Gas & Electric made an 8-hour nonemergency report (Reference NRC Event Notification 46856) in accordance with 10 CFR 50.72(b)(3)(iv)(A).

The actuation of Differential Relay 287 was due to modifications being performed on the 12 kV startup relay board (Panel RU) that contains components for both units. Mechanical vibration induced by a reciprocating saw caused the relay to actuate, thus opening the 12 kV Feeder to Startup Bus Breaker 52VU12 and isolating Unit 1 230 kV startup power.

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NARRATIVE

I. PLANT CONDITIONS

When the event occurred, Unit 1 was in Mode 1 (Power Operation) at approximately 100 percent power.

II. DESCRIPTION OF PROBLEM

A. BACKGROUND

The Diablo Canyon Power Plant (DCPP) electrical systems are designed to ensure an adequate supply of electrical power to all essential auxiliary equipment during normal operation and under accident conditions. Nonvital 4.16 kV alternating current (AC) auxiliary buses are energized by either offsite power or power from the main generator. Vital AC buses [EA] [BU] have an additional available source, which includes onsite power delivered by diesel generators. The electrical systems are designed so that failure of any one electrical device will not prevent operation of the minimum required engineered safety feature (ESF) equipment.

General Design Criteria (GDC) 17 states, in part,

"An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents."

DCPP offsite power is supplied by two systems that are physically and electrically separated and independent of each other: a 230 kV system and a 500 kV system. This satisfies requirements established by GDC 17. The 230 kV system provides startup and standby power, and is immediately available following a loss-of-coolant accident (LOCA) to assure that core cooling, containment integrity, and other vital safety functions are maintained. To make power available to the vital 4.16 kV buses, the 230 kV system provides power to Startup Transformer (SUT)[EA][XFMR] 1-1 (230 kV to 12 kV), which then feeds SUT 1-2 (12 kV to 4.16 kV). The 500 kV system provides for transmission of the plant's power output, and is also available as a delayed access source of offsite power after the main generator is disconnected.

Technical Specification (TS) 3.8.1 requires two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System. If one required offsite circuit is inoperable, TS Action 3.8.1 is entered and the following actions are required: DCPP must perform Surveillance Requirement (SR) 3.8.1.1 for required operable offsite circuit within 1 hour and once every 8 hours thereafter, and restore required offsite circuit to operable status within 72 hours and 14 days from discovery of failure to meet the Limiting Condition for Operation (LCO).

To produce onsite power, each unit has three emergency diesel generators (EDGs)[EK][DG], which supply power to the 4.16 kV vital AC buses when power is unavailable or voltage degrades below a point at which required ESF loads would be operable. After EDGs have started, they will supply power to their respective vital bus if the buses are deenergized. If the vital buses are not deenergized, the EDGs will continue to run in standby mode, ready to provide power if required.

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NARRATIVE

B. EVENT DESCRIPTION

At the time of the event, Unit 2 Sixteenth Refueling Outage (2R16) was ongoing and modifications were being made to the 230 kV startup system. On May 17, 2011, at 0954 PDT, while work was being performed on a relay panel containing components for both units, the 230 kV Line Differential Relay 287 actuated. This opened the 12 kV Feeder to Startup Bus Breaker 52VU12 and resulted in a loss of power to the Unit 1 12 kV startup bus.

The isolation of the offsite standby power source, and subsequent loss of power to startup feeder breakers for the 4.16 kV operating buses, caused all Unit 1 EDGs to start in standby mode. The EDGs started as designed with no problems observed.

All Unit 1 EDGs were shutdown and returned to auto. SUTs 1-1 and 1-2 were returned to service, and on May 17, 2011, at 1125 PDT, Unit 1 startup power was declared operable.

Startup power on Unit 2 was cleared due to the maintenance activities being performed; therefore, it was unaffected by the event.

On May 17, 2011, at 1542, Pacific Gas & Electric (PG&E) made an 8-hour nonemergency report (Reference NRC Event Notification 46856) in accordance with 10 CFR 50.72(b)(3)(iv)(A).

C. STATUS OF INOPERABLE STRUCTURE, SYSTEMS, OR COMPONENTS THAT CONTRIBUTED TO THE EVENT

There were no inoperable structures, systems, or components that contributed to the event. All systems functioned as designed.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED

No other systems or secondary functions were affected.

E. METHOD OF DISCOVERY

The event was immediately known to licensed plant operators by alarms and indications received in the control room.

F. OPERATOR ACTIONS

Plant operators performed required surveillances, secured the Unit 1 EDGs, and proceeded to restore the availability of startup power to Unit 1.

G. SAFETY SYSTEM RESPONSES

All Unit 1 EDGs started as designed with no problems observed.

NARRATIVE

III. CAUSE OF THE PROBLEM

A. IMMEDIATE CAUSE

The 230 kV Line Differential Relay 287 was inadvertently actuated due to maintenance activities on the 12 kV startup relay board (Panel RU) where Relay 287 is installed. As part of the maintenance work being conducted during 2R16, a reciprocating saw was used to cut an opening in Panel RU, which is common to both Units 1 and 2. Mechanical vibration induced by the power tool caused the relay to actuate, thus opening Breaker 52VU12 and isolating startup power.

B. CAUSE

Cause to be provided in a supplemental report following the completion of a root cause evaluation (RCE).

IV. ASSESSMENT OF SAFETY CONSEQUENCES

At DCPP, the 230 kV system is the only offsite power system which is designed to be immediately available to mitigate the consequences of postulated accidents; therefore, this event could have prevented fulfillment of a safety function of the offsite electric power system. However, the Class 1E onsite EDGs remained available and would have provided power following a loss of offsite power.

The voltage on operating buses was not affected by the isolation of 230 kV startup power, and the EDGs were not required since all vital buses were powered by the Unit 1 main generator. As a result, no vital loads were affected by this event.

The increased conditional core damage probability for this event was assessed and found to be less than 4E-07.

This event had no adverse affect on the health and safety of the public.

V. CORRECTIVE ACTIONS

A. IMMEDIATE CORRECTION ACTIONS

PG&E restored startup power and identified sensitive devices in the electrical panel that would need to be isolated or protected. Clearances were modified to add relays in the "cut out" position and maintenance ceased cutting methods involving a reciprocating saw. Instead, personnel were instructed to use a cutting wheel in order to minimize vibration.

B. CORRECTIVE ACTIONS TO PREVENT RECURRENCE (CAPRs)

CAPRs to be detailed in a supplemental report following the completion of a RCE.

NARRATIVE

VI. ADDITIONAL INFORMATION

A. FAILED COMPONENTS

All components functioned as designed.

B. PREVIOUS SIMILAR EVENTS

There are no examples of previous events where offsite power was isolated due to relay vibration at DCPP in the past three years.