



**Pacific Gas and  
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October 29, 2002

PG&E Letter DCL-02-127

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

Docket No. 50-275, OL-DPR-80  
Diablo Canyon Unit 1

Licensee Event Report 1-2002-003-01

Unanalyzed Condition Due to Heavy Load Movement Over a Restricted Area

Dear Commissioners and Staff:

PG&E is submitting the enclosed revision to licensee event report (LER) 1-2002-003 regarding an unanalyzed condition due to a heavy load moved over a restricted area. LER 1-2002-003 revision 0 was submitted by DCL-02-074 dated July 1, 2002. This submittal revises the corrective actions to prevent recurrence. The changes are noted with revision marks.

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

Sincerely,

David H. Oatley

ddm/2246/N0002144

cc/enc: Ellis W. Merschoff  
David L. Proulx  
Girija S. Shukla  
Diablo Distribution  
INPO

IE22

# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Diablo Canyon Unit 1</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 2 7 5</b>	PAGE (3) <b>1 OF 7</b>
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TITLE (4)

**Unanalyzed Condition Due to Heavy Load Movement Over a Restricted Area**

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MO	DAY	YEAR	FACILITY NAME		DOCKET NUMBER		
04	30	2002	2002	- 0 0 3	- 0 1	10	29	2002			5 0 0 0 0		

OPERATING MODE (9) <b>5</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)  <div style="display: flex; justify-content: space-between;"> <span><u>  X  </u> 10 CFR</span> <span><u>50.73(a)(2)(ii)(B) and (a)(2)(v)(D)</u></span> </div> <div style="display: flex; justify-content: space-between;"> <span><u>          </u> OTHER</span> <span>(SPECIFY IN ABSTRACT BELOW AND IN TEXT, NRC FORM 366A)</span> </div>
POWER LEVEL (10) <b>0</b>	

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
<b>Roger Russell - Senior Regulatory Services Engineer</b>		AREA CODE <b>805</b>	NUMBER <b>545-4327</b>

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

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

ABSTRACT (Limit to 1400 spaces i.e., approximately 15 single-spaced typewritten lines) (16)

On April 30, 2002, between 0930 and 0940 PDT, with the unit in Mode 5 (Cold Shutdown), a main turbine low pressure (LP) turbine outer cover was moved over a Unit 1 turbine building heavy loads restricted area above the diesel generators and 4kV vital bus ventilation, contrary to Inter-Departmental Administrative Procedure MA1.ID14, "Plant Crane Operating Restrictions." The 70-ton LP turbine cover was moved from the LP C turbine location (northern most LP section at center line of the turbine/generator), raised approximately 15 feet, transported north over the Operation Support Team offices on the north end of the elevation 140 foot turbine building, then west, and lowered onto a previously evaluated laydown area designated on the laydown drawing.

The primary cause of the event was the failure of utility and outage contract turbine maintenance personnel to comply with procedures for movement of loads within a heavy loads restricted area.

Corrective actions to prevent recurrence include a review of this event for all crane operator and rigging qualifications, having a person knowledgeable in the heavy loads rigging program present at the pre-job tail boards, and modification of plant procedures requiring engineering to ensure, during their evaluations, that the movement of heavy loads will not violate restrictions for load handling.

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## TEXT

### I. Plant Conditions

Unit 1 was in Mode 5 (Cold Shutdown) during the movement of the heavy load. Fuel was not being moved.

### II. Description of Problem

#### A. Background

The heavy loads program for Diablo Canyon Power Plant was reviewed by the NRC and documented in Supplemental Safety Evaluation Report (SSER) 27.

SSER 27, Section IV, "Discussion of Revised License Conditions and Resolution of Issues," item 6, "Overhead Heavy-Load Handling Systems," states, in part:

As a result of Generic Task A-36, "Control of Heavy Loads Near Spent Fuel," a set of guidelines was developed to assure safe handling of heavy loads over structures, systems and components important to safety. Responses to a generic letter dated December 22, 1980, (Phase I, Section 5.1.1 of NUREG:0612) were to identify the load handling equipment within the scope of NUREG-0612 and to describe the associated general load handling operations such as safe load paths, procedures, operator training, special and general purpose of lifting devices, maintenance, testing and repair of equipment and the handling equipment specifications.

SSER 27, Appendix A, "Control of Heavy Loads at Nuclear Power Plants, Pacific Gas and Electric, Diablo Canyon Unit 1, (Phase I), Docket No. 50-275, Technical Evaluation Report," dated July 1984, Table 3.1, "Diablo Canyon Compliance Matrix," page 27, item 10, specifically identifies the low pressure (LP) turbine hood as a 70-ton heavy load requiring compliance with Guideline 1, "Safe Load Path," Guideline 2, "Procedures," and Guideline 5, "Slings."

Design Criteria Memorandum No. T-11, "Control of Heavy Loads," Section 2.2.2, "Exclusion Areas," subsection a., "Modes 1 through 6," describes the concept of an exclusion area. A restricted area allows limited overhead load handling based on the weight of the load and its maximum height above the floor. Prospective loads to be handled at weights or heights exceeding the Restricted Area parameters are excluded pending further analytical review and final approval by the Plant Staff Review Committee (PSRC) using a temporary load handling procedure. The area north of the Unit 1 main generator is a Heavy Loads

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## TEXT

Restricted Area per plant procedure MA1.ID14. There are plant systems beneath this area, which provide safe, cold shutdown and decay heat removal functions following a postulated heavy load drop. This is the basis for the Turbine Building Crane classification as a Heavy Loads Category 1 overhead load handling system.

### B. Event Description

On January 25, 2002, utility engineering personnel evaluated an action request (A0536183) from the Unit 1 outage management team for laydown floor loading proposed for the LP C turbine [NM][TRB] cover. Engineering concluded that the static floor loading was acceptable for a dead weight of 70 tons, supported by wooden cribbing (in accordance with the proposed "Turbine Elevation 140' Laydown Drawings.")

On April 30, 2002, between 0930 and 0940 PDT, with the unit in Mode 5, the main turbine LP C turbine cover was moved over a Unit 1 elevation 140 foot turbine building heavy loads restricted area above the Diesel Generators (DGs)[EK][DG] and 4kV vital bus ventilation [EB][DUCT] contrary to Inter-Departmental Administrative Procedure MA1.ID14, "Plant Crane Operating Restrictions." The 70-ton LP turbine cover was moved from the LP C turbine location (northern most LP section at center line of the turbine/generator), raised approximately 15 feet, transported north over the Operation Support Team building on the north end of the 140 foot deck, then west, and lowered approximately 15 feet onto the previously evaluated laydown area designated on the laydown drawing.

On May 1, 2002, utility quality assurance personnel investigating the report of a heavy load movement over an occupied building identified that the heavy load control program was violated. Additional investigation identified that moving the 70-ton load over the heavy loads restricted area was also a violation.

On May 7, 2002, the PSRC approved Temporary Procedure TD-0203, "," which provides load control guidance for the removal of the LP turbine cover from the restricted area to an appropriate storage area. Prerequisites for the heavy load movement included:

- (1) reactor was defueled,
- (2) limiting lift height until the cover was clear of the heavy loads restricted area,
- (3) turbine crane power was provided by one of the two Unit 2 sources,

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TEXT

and

(4) designated utility employee to be in charge of the heavy load move.

On May 10, 2002, the LP C turbine cover was removed from the elevation 140 foot turbine building heavy loads restricted area.

C. Inoperable Structures, Systems, or Components that Contributed to the Event  
None.

D. Other Systems or Secondary Functions Affected

A postulated drop of the LP C turbine cover would have damaged equipment required to function to achieve and maintain cold shutdown of Unit 1. A heavy load drop event would have affected Unit 1 equipment including; the ventilation supply fans for 4kV buses F and G, the Unit 1 DGs, and the Auxiliary Saltwater (ASW) pump 1-2 cable run. During the heavy load movement, 4kV vital bus F was out of service, which supplies ASW pump 1-1; therefore, loss of ASW pump 1-2 would have resulted in a loss of both Unit 1 ASW pumps.

E. Method of Discovery

Utility quality assurance personnel investigating the movement of a heavy load over occupied buildings located near the heavy loads restricted area identified the event.

F. Operator Actions

None.

G. Safety System Responses

None.

### III. Cause of the Problem

A. Root Cause

The primary cause of the event was the failure of utility and contract turbine maintenance personnel to comply with procedures for movement of loads within a heavy loads restricted area.

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### Contributory Causes include:

- (1) Utility and contract maintenance personnel did not read all relevant information on the laydown drawing, which stated that heavy loads were not part of the laydown evaluation,
- (2) Inadequate oversight of vendor activities, when considering the experience of contract personnel and the classification of the work, which included the heavy loads restricted area, and
- (3) Inadequate evaluation of changes for the outage.

### IV. Assessment of Safety Consequences

As documented in Engineering Calculation CHLP-T-200201, a drop of the LP C turbine cover would have damaged equipment required to function to achieve and maintain safe, cold shutdown of Unit 1 following a postulated heavy load drop event. Affected Unit 1 equipment included the ventilation supply fans for 4kV buses F and G, the Unit 1 DGs, and the ASW pump 1-2 cable run. No Unit 2 equipment or offsite power to either unit was affected.

During the load movement, 4kV vital bus F was out of service, which supplies ASW pump 1-1; therefore, loss of ASW pump 1-2 would have resulted in a loss of both Unit 1 ASW pumps. However, during the load movement, the three Unit 2 DGs and two Unit 2 ASW pumps were operable; and fuel was not being moved. As such, had vital 4kV or ASW been lost to Unit 1, transfer of vital power and ASW flow from Unit 2 would have been available.

A probabilistic risk assessment was performed to ascertain the risk impact for the evolution (Probabilistic Risk Analysis (PRA) Calculation PRA02-04 Revision 0). Since the 4kV bus room ventilation fans are not modeled in the PRA, the risk assessment was done to determine the impact from a loss of the Unit 1 DGs and Unit 1 ASW flow.

The risk assessment concluded that the move of the LP C turbine cover was a low risk significance activity. This conclusion was based on a comparison of the assessment results with the risk significance criteria given in Regulatory Guide 1.174.



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Actions for Technical Specifications (TS) 3.8.2, "AC Sources – Shutdown," and TS 3.8.10, "Distribution Systems – Shutdown," were satisfied with the DGs inoperable or the vital bus electrical power distribution subsystems inoperable because the unit was in Mode 5 (Cold Shutdown) with the reactor head installed; and, therefore, no fuel was being moved:

- (1) Suspend core alterations, and
- (2) Suspend movement of irradiated fuel assemblies, and
- (3) Initiate action to suspend operations involving positive reactivity additions, and
- (4) Initiate actions to restore components/systems to operable status.

### Conclusion

Based on the above information, PG&E used the NRC's significance determination process and believes the condition had low risk significance. Therefore, the health and safety of the public were not adversely affected by this event.

## V. Corrective Actions

### A. Immediate Corrective Actions

- (1) Verified acceptability of laydown location for LP C turbine cover.
- (2) Conducted a tailboard with all qualified utility and outage contract riggers and crane operators to review the heavy load handling requirements.
- (3) All overhead turbine crane lifts were restricted to require the presence of and approval by utility management until tailboards of all qualified riggers and crane operators were completed.
- (4) Utility personnel developed a safe load movement procedure for the removal of the LP turbine cover from the heavy load restricted area that included appropriate load path analysis, management review, and PSRC concurrence prior to movement.

### B. Corrective Actions to Prevent Recurrence

- (1) PG&E will include a review of this event in training for all crane operator and rigging qualifications,

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- (2) There will be a person knowledgeable in the heavy loads rigging program present at the pre-job tailboard for any heavy load movement that either traverses or will be placed in a heavy loads restricted area and/or a heavy loads exclusion area.
- (3) Plant procedures were revised to require engineering to ensure, during their evaluations, that the movement of heavy loads will not violate restrictions for load handling.

## VI. Additional Information

### A. Failed Components

None.

### B. Previous Similar Events

None.