



**Pacific Gas and  
Electric Company®**

**James R. Becker**  
Site Vice President

Diablo Canyon Power Plant  
Mail Code 104/6  
P. O. Box 56  
Avila Beach, CA 93424

805.545.3462  
Internal: 691.3462  
Fax: 805.545.6445

January 30, 2012

PG&E Letter DCL-12-011

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

10 CFR 50.73

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 & 2

Licensee Event Report 1-2011-007-01

Diablo Canyon Power Plant - Inadequate Control Room Envelope Testing Due to  
Inadequately-Documented In-leakage Test Data

Dear Commissioners and Staff;

Pacific Gas and Electric Company (PG&E) submits the enclosed Licensee Event Report (LER) supplement regarding control room envelope in-leakage testing. Both units are affected by this issue. PG&E is submitting this LER supplement in accordance with 10 CFR 50.73(a)(2)(ii)(B). This supplement provides new in-leakage test results, event cause, assessment of safety consequences, and corrective actions.

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

mlpy/50428146, Task 33

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

<b>NRC FORM 366</b> (10-2010)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 10/31/2013																																										
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)				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.																																												
<b>1. FACILITY NAME</b> Diablo Canyon Unit 1				<b>2. DOCKET NUMBER</b> <div style="display: flex; justify-content: space-around;"> <span>05000</span> <span>275</span> </div>		<b>3. PAGE</b> <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>OF</span> <span>4</span> </div>																																										
<b>4. TITLE</b> Inadequate Control Room Envelope Testing Due to Inadequately-Documented In-leakage Test Data																																																
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>																																							
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER																																						
09	12	2011	2011	- 7 -	1	01	30	2012	Diablo Canyon Unit 2	05000 323																																						
									FACILITY NAME	DOCKET NUMBER																																						
										05000																																						
<b>9. OPERATING MODE</b>  1			<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)																																													
<b>10. POWER LEVEL</b>  100			<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%;"><input type="checkbox"/> 20.2201(b)</td> <td style="width:25%;"><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td style="width:25%;"><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td style="width:25%;"><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td style="font-size: x-small;">Specify in Abstract below or in NRC Form 366A</td> </tr> </table>										<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)																																													
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)																																													
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)																																													
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)																																													
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)																																													
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)																																													
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)																																													
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER																																													
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A																																													
<b>12. LICENSEE CONTACT FOR THIS LER</b>																																																
FACILITY NAME L. Mark Padovan - Regulatory Services Supervisor									TELEPHONE NUMBER (Include Area Code) (805) 545-4540																																							
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>																																																
CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX																																							
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>						<b>15. EXPECTED SUBMISSION DATE</b>		MONTH	DAY	YEAR																																						
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)						<input checked="" type="checkbox"/> NO																																										
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																																																
<p>On September 12, 2011, at 1745 PDT, operators declared the Unit 1 and 2 common control room envelope (CRE) boundary inoperable and entered Technical Specification (TS) 3.7.10, "Control Room Ventilation System (CRVS)." This was due to discovery of inadequately-documented CRE in-leakage test data. Plant personnel reviewing the 2005 test report for the common CRE identified that three of the four ventilation alignments tested had values of in-leakage greater than zero SCFM, yet PG&amp;E had concluded that these results were adequate to show that the CRE had no unfiltered in-leakage. At 2257 PDT on September 12, 2011, PG&amp;E made an 8-hour nonemergency report (reference NRC Event Notification 47258) under 10 CFR 50.72(b)(3)(ii)(B). On September 13, 2011, plant personnel verified that administrative controls were in place to maintain post-LOCA ECCS leakage at a rate that would ensure operator doses would not exceed the GDC 19 limits for the highest in-leakage rate reported in the test. On October 18, 2011, plant staff further identified that inadequate information was available in the report to conclude that the limiting condition for testing (where only one train of the CRVS was functioning) would result in zero SCFM in-leakage into the CRE. This was contrary to Regulatory Guide 1.197. PG&amp;E updated Event Notification 47258 on September 16, and October 18, 2011.</p> <p>Human error affected the interpretation of test results and led to the nonconservative determination of zero in-leakage in 2005. Plant staff reassessed the previously implemented administrative controls and concluded that control room operator doses would not exceed GDC 19 limits. PG&amp;E performed an assessment of the testing and revised procedures to specify separate acceptance criteria for each of the tested CRVS configurations in accordance with RG 1.197.</p>																																																

**LICENSEE EVENT REPORT (LER)** U.S. NUCLEAR REGULATORY COMMISSION  
**CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Diablo Canyon Unit 1	05000 275	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4
		2011	- 007	- 01	

**NARRATIVE**

**I. Plant Conditions**

At the time of discovery, Units 1 and 2 were in Mode 1 (Power Operation) at 100 percent power.

**II. Description of Problem**

**A. Background**

The Units 1 and 2 common Control Room Ventilation System (CRVS) provides a protected environment from which operators can control the units from the common control room following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The CRVS consists of two trains that recirculate and filter the air in the common control room envelope (CRE), and a CRE boundary that limits the in-leakage of unfiltered air (one CRVS train from each unit).

The CRVS is an emergency system, parts of which may also operate during normal unit operations. Upon receipt of an actuating signal, the normal air supply to the CRE is isolated, and the stream of outside ventilation air from the pressurization system and recirculated control room air is passed through a system filter. The pressurization system draws outside air from either the north end or the south end of the turbine building based upon the wind direction or the absence of releases at the inlet. The prefilters remove any large particles in the air to prevent excessive loading of the high-efficiency particulate air filters and charcoal adsorbers [ADS].

The CRVS is designed to maintain a habitable environment in the Units 1 and 2 common CRE for the duration of the most severe Design Basis Accident without exceeding a 5 rem whole body dose or its equivalent to any part of the body using only one train of the CRVS.

**B. Event Description**

On September 12, 2011, at 1745 PDT, operators declared the Units 1 and 2 CRE inoperable and entered Technical Specification (TS) 3.7.10, "Control Room Ventilation System (CRVS)." This was due to discovery of inadequately-documented CRE in-leakage test data. Plant personnel reviewing the test report (dated February 3, 2005) for the common CRE identified that three of the four ventilation alignments tested had values of in-leakage greater than zero standard cubic feet per minute (SCFM). However, Pacific Gas & Electric (PG&E) had concluded that these results were adequate to show that the CRE had no unfiltered in-leakage, and had provided this information to the NRC in a letter dated April 22, 2005. At 2257 PDT on September 12, 2011, PG&E made an 8-hour nonemergency report (reference NRC Event Notification 47258) under 10 CFR 50.72(b)(3)(ii)(B). On September 13, 2011, plant personnel verified that administrative controls were in place to maintain post loss-of-coolant accident emergency core cooling system leakage at a rate that would ensure operator doses were maintained less than the Final Safety Analysis Report accident analysis results for the highest in-leakage rate reported in the test.

On October 18, 2011, plant staff further identified that inadequate information was available in the report to conclude that the limiting condition for testing (where only one train of the CRVS was functioning) would result in zero SCFM in-leakage into the CRE. This was contrary to Regulatory Guide 1.197, Revision 0, May 2003 (RG 1.197), "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors." PG&E updated Event Notification 47258 on September 16, and October 18, 2011.

LICENSEE EVENT REPORT (LER) U.S. NUCLEAR REGULATORY COMMISSION  
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Diablo Canyon Unit 1	05000 275	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		2011	007	01	

## NARRATIVE

In November 2011, PG&E reperformed the CRE in-leakage test with one unit in CRVS pressurization mode and the other unit in recirculation mode. This is the most limiting operator dose consequence configuration, under existing plant configuration controls, which ensures that both CRVS trains will be available following a design basis accident. Four phases of tests were performed using each of the CRVS subtrains for pressurization. A fifth phase test used the most limiting of the subtrains, along with a supply flowpath to the Technical Support Center (TSC). During the testing, several deficiencies were found and will be repaired through plant processes. PG&E completed the test on November 8, 2011. The results of the testing are shown in the following:

## November 2011 CRE In-leakage Test Results

Test Phase	In-leakage by Pitot (SCFM)	In-leakage by Tracer (SCFM)
1	30	29
2	19	18
3	51	41
3*	16	14
4	23	26
5**	36	45

\* Phase 3 was repeated with two identified sources of in-leakage temporarily corrected.

\*\* Phase 5 repeated the phase with the highest measured in-leakage (phase 3) with the TSC portion of the ventilation system operating.

The maximum in-leakage test result of 51 SCFM is 1 SCFM higher than that given in PG&E Letter DCL-11-127, "Control Room Envelope Testing," dated December 2, 2011, as the test results reported in DCL-11-127 were based on a contractor test report. PG&E later identified the inaccurate value, and the contractor revised its test report to correct the value to 51 SCFM. This error was entered into the corrective action program.

## C. Status of Inoperable Structure, Systems, or Components That Contributed to the Event

None.

## D. Other Systems or Secondary Functions Affected

None.

## E. Method of Discovery

PG&E investigations in response to questioning from the NRC Senior Resident Inspector about the 2005 CRE in-leakage testing led to the discovery of inadequate testing.

## F. Operator Actions

Operators took required actions associated with TS 3.7.10.B, and implemented administrative controls to maintain post loss-of-coolant accident emergency core cooling system leakage at a rate that would ensure operator doses were maintained less than the Final Safety Analysis Report accident analysis results for the highest in-leakage rate reported in the test.

**LICENSEE EVENT REPORT (LER)** U.S. NUCLEAR REGULATORY COMMISSION  
**CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Diablo Canyon Unit 1	05000 275	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2011	- 007	- 01	

**NARRATIVE**

**G. Safety System Responses**

None.

**III. Cause of the Problem**

PG&E performed an Apparent Cause Evaluation to determine the apparent cause for concluding that the 2005 test demonstrated no unfiltered in-leakage. The evaluation determined that human error (a mental mindset) in the interpretation of test results led to a nonconservative determination of zero leakage.

**IV. Assessment of Safety Consequences**

Diablo Canyon Power Plant (DCPP) personnel implemented administrative controls to mitigate the consequences of the 2005 worst-case in-leakage test result of 60 CFM. PG&E reviewed emergency core cooling system (ECCS) leakage outside containment over the past 3 years, and concluded that actual ECCS leakage was controlled to ensure that control room operator dose did not exceed General Design Criterion (GDC)-19 (1971) limits. An operability evaluation was performed to support restoration of OPERABILITY. The CRVS continues to meet its safety function. This event did not result in radiological release to plant personnel or the public. Therefore, this event did not adversely affect the health and safety of the public.

**V. Corrective Actions**

PG&E revised CRVS testing procedures to specify separate acceptance criteria for each of the tested configurations in accordance with RG 1.197. Plant procedure modifications assure that testing is conducted in the alignment that would result in the greatest consequence to control room operators during a design-basis accident. PG&E also had an outside contractor perform an independent assessment of the CRE inleakage test configuration. The contractor reviewed the requirements of RG 1.197 and DCPP's CRVS design, and determined that the testing alignments used in plant procedures conform to RG 1.197 requirements.

PG&E also has submitted a revised licensing basis analyses of record for NRC review and approval via License Amendment Request 11-06 (see PG&E Letter DCL-11-072 dated 10/24/11).

**VI. Additional Information**

**A. Failed Components**

All components functioned as designed.

**B. Previous Similar Events**

There are no examples of previous similar events at DCPP.