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January 24, 2013

PG&E Letter DCL-13-003

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 and 2

Licensee Event Report 1-2011-007-02

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 (CRE) in-leakage testing. Both Units 1 and 2 are affected by this issue. PG&E is submitting this LER supplement in accordance with 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(ii)(B). This supplement includes PG&E's actions following the NRC's review of Diablo Canyon's CRE testing documented in NRC Task Interface Agreement 2012-08. It also includes additional cause and corrective actions.

PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this report.

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

Sincerely,

Barry S. Allen

wrl8/50428146

Enclosure

cc/enc: Elmo E. Collins, NRC Region IV
Thomas R. Hipschman, NRC Senior Resident Inspector
Joseph M. Sebrosky, NRR Senior Project Manager
INPO
Diablo Distribution

LICENSEE EVENT REPORT (LER)

(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.

1. FACILITY NAME Diablo Canyon Power Plant, Unit 1									2. DOCKET NUMBER 05000-275	3. PAGE 1 OF 6																											
4. TITLE Inadequate Control Room Envelope Testing Due to Inadequately-Documented In-leakage Test Data																																					
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 Diablo Canyon, Unit 2	DOCKET NUMBER 05000-323																											
09	12	2011	2011 - 007 - 02			01	24	2013	FACILITY NAME	DOCKET NUMBER																											
9. OPERATING MODE 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)																																		
			<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)	OTHER Specify in Abstract below or in NRC Form 366A	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)
12. LICENSEE CONTACT FOR THIS LER																																					
FACILITY NAME Wilbert R. Landreth, Regulatory Services Engineer									TELEPHONE NUMBER (Include Area Code) (805) 545-6980																												
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT																																					
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX																											
14. SUPPLEMENTAL REPORT EXPECTED									15. EXPECTED SUBMISSION DATE	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)." Pacific Gas and Electric Company (PG&E) had concluded that 2005 test data did not demonstrate that the CRE had no unfiltered in-leakage. 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 would not exceed the General Design Criterion (GDC) 19 limits for the highest in-leakage rate reported in the test. On January 30, 2012, PG&E submitted LER 1-2011-007-01, for Diablo Canyon Power Plant as an unanalyzed condition. PG&E is submitting this supplemental report under 10 CFR 50.73(a)(2)(i)(B) also, as a condition prohibited by TS following review of NRC Task Interface Agreement dated November 20, 2012.</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&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 Regulatory Guide 1.197. PG&E subsequently modified the CRVS and successfully completed CRE testing using a single CRVS train.</p>																																					

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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 Unit 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 (CR) following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The CRVS consists of two trains (one CRVS train from each unit) 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. A CRVS train is operable when the associated:

1. main supply fan [FAN] (one), filter booster fan (one) and pressurization fan (one) are operable;
2. high-efficiency particulate-air (HEPA) filters [FLT] and charcoal adsorbers [ADS] are not excessively restricting flow, and are capable of performing their filtration functions; and
3. ductwork [DUCT], valves [V], and dampers [DMP] are operable, and air circulation can be maintained.

Each train is comprised of two redundant, full-capacity, active components so that each train is composed of two subtrains. Technical Specification (TS) 3.7.10, "Control Room Ventilation System (CRVS)," for the CRVS pertains to the two CRVS trains rather than the four subtrains. Either of the two redundant subtrains are manually selected via a switch in the CR, with either subtrain in each unit capable of satisfying the CRVS train operability requirement.

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 CR 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 [NM]. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

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 (DBA) without exceeding 5-rem whole body dose or its equivalent to any part of the body (calculated over 30 days).

In NRC letter dated December 23, 2008, the NRC issued License Amendments 201 and 202 to Diablo Canyon Power Plant (DCPP) Units 1 and 2, respectively. These amendments revised the required action and surveillance requirements in TS 3.7.10, consistent with Technical Specification Task Force Traveler-448, "Control Room Habitability," Revision 3, establishing surveillance requirement (SR) 3.7.10.5 to test CR in-leakage.

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B. Event Description

On September 12, 2011, at 1745 PDT, operators declared the Units 1 and 2 CRE inoperable and entered TS 3.7.10. 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 PG&E Letter DCL-05-042, "Control Room Envelope In-leakage Test Results Relative to Generic Letter 2003-01, 'Control Room Habitability,'" dated April 22, 2005. At 2257 PDT on September 12, 2011, PG&E made an 8-hour nonemergency report (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 (LOCA) emergency core cooling system (ECCS) leakage at a rate that would ensure operator doses were maintained less than the Final Safety Analysis Report (FSAR) 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 (RG) 1.197, Revision 0, May 2003, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors." PG&E updated Event Notification 47258 on September 16, and October 18, 2011.

In November 2011, PG&E established compensatory measures that assured both trains would remain available to operators even in the event of a single failure of an operating train. These compensatory actions were taken to address a design deficiency (described in LER 1-2011-008-01). PG&E reperformed the CRE in-leakage test with one unit in CRVS pressurization mode and the other unit in recirculation mode. This was the most limiting operator-dose consequence configuration, with the compensatory measures in place, ensuring that both CRVS trains will be available following a DBA. Four test phases 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 were repaired through plant processes. PG&E completed the test on November 8, 2011. The results of the CRE in-leakage testing showed the following:

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.

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The maximum in-leakage test result of 51 SCFM was 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 DCPP's corrective action program.

On October 1, 2012, PG&E declared the CRE inoperable to modify the CRVS to eliminate the design vulnerability. On November 28, 2012, PG&E received the NRC's Task Interface Agreement (TIA) 2012-08, "Final Response to Task Interface Agreement 2012-08, Diablo Canyon Power Plant, Unit 1 and 2 – Request Office of Nuclear Reactor Regulation's Review of Operability Issues Associated with Technical Specification 3.7.10, 'Control Room Ventilation System,'" dated November 20, 2012. The TIA concluded that DCPP's CRE had not been restored to operable status because PG&E "has not changed the licensing basis DBA or repaired the CRE boundary or performed a combination of these...Further, SR 3.7.10.5 requires testing the CRE in-leakage with the CRVS in the design basis accident configuration to verify the operability of the CRE boundary. Operation of CRVS equipment from both trains is not credited in the current licensing basis as part of the design basis configuration. Performing the in-leakage test with CRVS equipment from the opposite train in operation does not satisfy the requirements for performing SR 3.7.10.5." PG&E subsequently concluded that because the in-leakage was performed with both trains operating, the SR had not been performed as required, nor had it ever been performed as required. Therefore, DCPP had been in violation of this TS since the issuance of License Amendments 201 and 202 for DCPP Units 1 and 2, regardless of the in-leakage flow rates obtained.

In December 2012, after modifying the CRVS, PG&E satisfactorily completed in-leakage testing on the CRVS using a single CRVS train, successfully demonstrating acceptable in-leakage in the most limiting configuration with a single CRVS train operating. Operators declared the CRE operable on December 20, 2012.

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.

On November 28, 2012, PG&E received the NRC's TIA 2012-08, which clarified the compensatory measures acceptable to the NRC that would allow declaration of operability following in-leakage test failure. Consequently, PG&E recognized that the CRE had been incorrectly declared operable, contrary to the requirements of TS 3.7.10.

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NARRATIVE**F. Operator Actions**

Following the September 12, 2011, assessment of the 2005 test data, operators completed TS 3.7.10 Required Actions B.1 and B.2 within the respective completion times, and implemented administrative controls to maintain post LOCA ECCS leakage at a rate that would ensure operator doses were maintained less than the FSAR accident analysis results for the highest in-leakage rate reported in the test.

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.

The cause of incorrectly declaring the CRVS operable was that the bases for SR 3.7.10.5 were unclear, and PG&E clarified via consulting industry experts versus requesting that NRC clarify the intent of the SR Bases.

IV. Assessment of Safety Consequences

PG&E reviewed ECCS leakage outside containment over the past 3 years, and concluded that actual ECCS leakage had been controlled to ensure that CR operator dose did not exceed General Design Criterion 19 (1971) limits. The CRVS has remained capable of performing 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 CR operators during a DBA. PG&E also had an outside contractor perform an independent assessment of the CRE in-leakage 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 performed testing of the CRVS in an alignment as clarified by the NRC's TIA 2012-08 following CRVS modification. CR operators exited TS 3.7.10, Condition B, on December 20, 2012.

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PG&E will revise the SR 3.7.10.5 bases, and the in-leakage test, to address the NRC's clarification in its TIA 2012-08. PG&E revised the DCPP Current Licensing Basis Determination procedure to provide guidance to seek NRC clarification on issues that may involve difference in NRC and industry perspective.

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.