



**Pacific Gas and
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June 3, 2013

PG&E Letter DCL-13-062

10 CFR 50.73

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

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Licensee Event Report 1-2012-005-01, Unanalyzed Condition due to
Nonconservative Change in Atmospheric Dispersion Factor

- References: 1. PG&E Letter DCL-12-082, "Licensee Event Report 1-2012-005-00, Unanalyzed Condition due to Nonconservative Change in Atmospheric Dispersion Factor," dated August 31, 2012.
2. PG&E Letter DCL-13-034, "Expected Submittal Date for Licensee Event Report 1-2012-005 Supplement," dated April 1, 2012.

Dear Commissioners and Staff:

In Reference 1, Pacific Gas and Electric Company (PG&E) submitted a Licensee Event Report (LER) to the U.S. Nuclear Regulatory Commission (NRC) related to an unanalyzed condition involving a nonconservative change in atmospheric dispersion factor. In this LER, PG&E indicated that it would provide a supplemental report to explain the safety consequences of this event by April 1, 2013, following the completion of a safety consequences assessment.

In Reference 2, PG&E notified the NRC about the revised expected date for the associated supplemental LER 1-2012-005-01 based on a pending safety consequences assessment.

PG&E submits the enclosed supplemental LER which includes the completed safety consequences assessment.

PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this letter. All corrective actions will be implemented in accordance with the Corrective Action Program.



Sincerely,

A handwritten signature in dark ink, appearing to read 'Barry S. Allen'.

Barry S. Allen
Site Vice President

J8L3/ 50497328

Enclosure

cc/enc: Thomas R. Hipschman, NRC Senior Resident Inspector
Arthur T. Howell, III, NRC Region IV
James T. Polickoski, NRR Project Manager
INPO
Diablo Distribution

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, (3150-1104), 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**Diablo Canyon Power Plant, Unit 1****2. DOCKET NUMBER****05000-275****3. PAGE****1 OF 5****4. TITLE****Unanalyzed Condition due to Nonconservative Change in Atmospheric Dispersion Factor**

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
07	05	2012	2012 -	005 -	01	06	03	2013	Diablo Canyon, Unit 2	05000-323

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR§: (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 checked="" 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 checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER**FACILITY NAME****Joe Loya, Senior Regulatory Services Engineer****TELEPHONE NUMBER (Include Area Code)****(805) 545-4486****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 RESPONSE EXPECTED☐ YES (if yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

On July 5, 2012, Pacific Gas and Electric Company (PG&E) identified a nonconservative change in the Diablo Canyon Power Plant (DCPP) Updated Final Safety Analysis Report (UFSAR) Chapter 15, "Accident Analyses," control room (CR) atmospheric dispersion factor (X/Q) methodology, made in Revision 2 of the DCPP UFSAR in 1986. As a result of further investigation into the adequacy of the original analyses, on August 28, 2012, PG&E identified additional release pathways that had not been correctly modeled in the original analyses and could affect the CR operator dose following a large break loss of cooling accident. Consequently, PG&E declared the CR Envelope inoperable and established mitigative actions. PG&E concluded that the CR Ventilation System (CRVS) would not have been capable of performing its safety function. PG&E has since established modifications and compensatory measures to ensure the containment, CR Envelope/CRVS, and fuel handling building ventilation system safety functions remain capable of satisfying General Design Criterion 19 limits.

The cause of this event was determined to be an inadequate design control process in 1986, whereby the analysis change was made without evaluating the change in accordance with 10 CFR 50.59 to determine whether or not prior NRC review and approval was required. The corrective actions include 1) revising the X/Qs used in the analyses and incorporate them into the DCPP licensing basis, and 2) completing the licensing basis verification project that is reviewing, validating, and revising the current DCPP licensing basis.

This condition did not have an adverse effect on the health, and safety of the public.

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NARRATIVE**I. Plant Conditions**

On July 11, 2012, Units 1 and 2 were in Mode 1 (Power Operation) at 100 percent power. The Unit 1 control room envelope (CRE) was inoperable due to preplanned maintenance on a Unit 1 control room ventilation system (CRVS) subtrain.

II. Problem Description**A. Background**

Units 1 and 2 CRVSs provide 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 CRE, and a CRE boundary that limits the in-leakage of unfiltered air. Each train is comprised of two redundant, full-capacity, active components such that each train is composed of two subtrains.

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 [FLT]. 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 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 (DBA) without exceeding 5 Rem whole-body dose or its equivalent to any part of the body (calculated over 30 days) to assure compliance with General Design Criteria (GDC) 19. Updated Final Safety Analysis Report (UFSAR) Chapter 15 dose analyses use atmospheric dispersion factors (X/Qs) to determine the dose CR operators receive after an accident.

B. Event Description

On July 5, 2012, Pacific Gas and Electric Company (PG&E) identified a nonconservative change in the Diablo Canyon Power Plant (DCPP) UFSAR Chapter 15, "Accident Analyses," CR X/Q values made in Revision 2 in 1986. Before Revision 2 of the DCPP UFSAR, the CR X/Q calculation used the Murphy-Campe (MC) methodology.

Revision 2 of the DCPP UFSAR replaced the MC methodology with a modified-Halitsky (MH) methodology for determining X/Qs. PG&E did not evaluate the UFSAR Revision 2 change in accordance with 10 CFR 50.59 to determine whether or not NRC review and approval of the change was required prior to implementation. The UFSAR change request did identify that the change increased the radiological dose the CR operators would receive in the event of an accident, but that dose would not exceed GDC 19 limits.

On July 11, 2012, at 0345 PDT, CR operators declared the CRE inoperable because the CR dose calculations used a X/Q value that was neither evaluated per 10 CFR 50.59 nor reviewed and approved by the NRC for use at DCPP, and thus constituted an unanalyzed condition. The NRC Resident Inspector identified PG&E's delay in reviewing operability

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between July 5 and July 11, 2012. The delay was due to personnel errors in communicating the concern to control room licensed operators for evaluation. Preliminary dose calculations, using the originally-licensed methods, concluded the CR operator dose limit of 30 Rem thyroid would be exceeded following a large-break loss-of-coolant accident (LBLOCA). Plant operators had already entered Technical Specification (TS) 3.7.10, "Control Room Ventilation System (CRVS)," Condition B, which states: "One or more CRVS trains inoperable due to inoperable CRE boundary in MODE 1, 2, 3, or 4," due to preplanned maintenance on a Unit 1 CRVS subtrain. Since plant operators had already completed Action B.1, "Initiate action to implement mitigating actions immediately," and Action B.2, "Verify mitigating actions ensure CRE occupant exposures to radiological hazards will not exceed limits, and CRE occupants are protected from smoke and chemical hazards within 24 hours," because of the preplanned maintenance, operators reevaluated the mitigating actions (i.e., availability of self-contained breathing apparatus and staging of potassium iodide) that were already in place and found them to be adequate. However, Action B.3, "Restore CRE boundary to OPERABLE status," had not yet been completed.

On July 26, 2012, at 1152 PDT, PG&E established new compensatory actions to restrict allowable emergency core cooling system (ECCS) leakage and containment [NH] leakage, and declared the CRE operable after completing a prompt operability assessment (POA) that concluded the CR operator dose limit of 30 Rem thyroid following a LBLOCA would not be exceeded under accident conditions with the compensatory actions in place. The POA additionally identified the fuel handling accident analyses also used the MH methodology X/Qs. Compensatory actions were established to prohibit fuel movement until the issue was resolved.

Emergency planning models and offsite dose analyses do not rely on the X/Qs derived from MH methodology and are not impacted by this incorrect analysis change. Therefore, this condition is limited to the CR post-accident dose for both Units 1 and 2.

After further investigation into the adequacy of the original analyses, on August 28, 2012, PG&E identified additional release pathway X/Q's that had not been correctly modeled in the original analyses and could affect the CR operator dose following a LBLOCA or a fuel handling accident. At that time, PG&E evaluated this condition and concluded that the previously established compensatory measures adequately addressed these errors.

However, based on further analysis of the conditions described above PG&E subsequently concluded that the CRVS would not have been capable of performing its safety function of mitigating the CR operator dose consequences of a LBLOCA or a fuel handling accident.

In December 2012, PG&E completed CRVS modifications, performed tracer gas in-leakage testing for the CRVS, and established additional compensatory measures involving the auxiliary building ventilation system to ensure CRE/CRVS remain capable of satisfying GDC 19 limits following a LBLOCA. In January 2013, PG&E established compensatory measures involving the CRVS and fuel handling building ventilation system prior to fuel movement to ensure the CRE/CRVS remain capable of satisfying GDC 19 limits.

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

None.

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D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

PG&E discovered this incorrect change to the X/Qs during a licensing basis review of UFSAR Chapter 15, Section 15.5, "Environmental Consequences of Plant Accidents."

F. Operator Actions

On July 11 and August 28, 2012, plant operators entered TS 3.7.10, "Control Room Ventilation System (CRVS)," Condition B, and implemented mitigative actions as directed by TS Actions B.1 and B.2.

G. Safety System Responses

None.

III. Cause of the Problem

The incorrect change of the X/Qs was determined to have been caused by inadequate design control processes in 1986, whereby the analysis change was made without evaluating the change in accordance with 10 CFR 50.59 to determine whether prior NRC review and approval was required.

IV. Assessment of Safety Consequences

The effect of a nonconservative change in X/Q methodology on operator actions modeled in the probabilistic risk assessment (PRA) would have an insignificant impact on the calculated core damage frequency and large early release frequency. Although the revised methodology indicates CR operator dose could have been greater than 30 REM in 30 days, given the existing operator procedural guidance and mitigating actions the incremental dose increase to CR operators within the 24 hour PRA mission time would not impair the operator's ability to perform risk significant, post-accident functions. This event resulted in no personnel injuries, no offsite radiological releases, and no damage to safety-related equipment. There were no challenges to plant safety.

V. Corrective Actions

1) PG&E will revise the accident analyses which used the MH X/Qs and incorporate the revised analyses into the DCPD licensing basis.

2) PG&E will complete its licensing basis verification project that is reviewing, validating, and revising the current DCPD licensing basis. This project was initiated in 2010. This project identified the problem described in this licensee event report (LER).

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NARRATIVE

VI. Additional Information

A. Failed Components

None.

B. Previous Similar Events

On September 12, 2011, at 1745 PDT, operators declared the Units 1 and 2 CRE boundary inoperable and entered TS 3.7.10, "Control Room Ventilation System (CRVS)." This was due to discovery of inadequately-documented CRE in-leakage test data. At 2257 PDT on September 12, 2011, PG&E made an 8-hour nonemergency report under 10 CFR 50.72(b)(3)(ii)(B). Human error affected the interpretation of test results and led to the nonconservative determination of zero in-leakage in 2005. Plant staff verified that administrative controls were in place to maintain post-loss-of-coolant accident ECCS leakage at a rate that would ensure that CR 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. (Reference LER 1-2011-007-01)

On November 3, 2011, at 1550 PDT, PG&E determined that the DCPD CRVS had a design vulnerability; whereby, unfiltered air supplied to the control room could exceed the flow rates used in the licensing-basis analysis of DBA consequences. PG&E discovered this vulnerability during performance of CR in-leakage testing required by TS Surveillance Requirement 3.7.10.5. On November 3, 2011, at 2051 PDT, PG&E made an 8-hour nonemergency report under 10 CFR 50.72(b)(3)(ii)(B). (Reference LER 1-2011-008-00)

C. Industry Reports

None.