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PG&E Letter DCL-13-077

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

10 CFR 50.46

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2  
10 CFR 50.46 Annual Report of Emergency Core Cooling System Evaluation  
Model Changes for Peak Cladding Temperature for 2012

Dear Commissioners and Staff:

Pursuant to 10 CFR 50.46, the enclosure to this letter is the annual report of changes in the Westinghouse emergency core cooling system evaluation models that affect peak cladding temperature (PCT) calculations for Pacific Gas and Electric Company's (PG&E's) Diablo Canyon Power Plant, Units 1 and 2. The attachments to the enclosure provide a summary of the PCT margin allocations and their bases.

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

If you have questions regarding this submittal please contact Mr. Steve Baker at 805-545-6742.

Sincerely,

Barry S. Allen

dho6/6038/64077331

Enclosure

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

**ANNUAL REPORT OF EMERGENCY CORE COOLING SYSTEM  
EVALUATION MODEL CHANGES FOR PEAK CLADDING TEMPERATURE**

Pursuant to 10 CFR 50.46, this enclosure provides an annual report of changes in the Westinghouse emergency core cooling system (ECCS) evaluation models that affect peak cladding temperature (PCT) calculations for Pacific Gas and Electric Company's (PG&E's) Diablo Canyon Power Plant (DCPP), Units 1 and 2. This report is based on changes described in Westinghouse Letter LTR-LIS-13-61, "Diablo Canyon Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2012," dated February 28, 2013.

Attachment A contains Unit 1 small-break loss-of-coolant accident (SBLOCA) and best-estimate, large-break loss-of-coolant accident (BELOCA) PCT Margin Utilization sheets. Attachment B contains the corresponding Unit 2 data. There have been no changes in the SBLOCA PCT results for either Unit 1 or Unit 2 since the last annual update. We provided the last annual update in PG&E Letter DCL-12-070, "10 CFR 50.46 Annual Report of Emergency Core Cooling System Evaluation Model Changes for 2011," dated July 19, 2012. There have been no changes in the BELOCA PCT results for either Unit 1 or Unit 2 since the 30-Day Notification Report provided in PG&E Letter DCL-12-102, "10 CFR 50.46 30-Day Notification Report of Significant Emergency Core Cooling System Evaluation Model Changes that Affect Peak Cladding Temperature," dated October 18, 2012.

The final net PCT values are listed below for each unit. Two PCT values are reported for the Unit 1 BELOCA results. The two BELOCA PCT values are labeled Reflood 1 and Reflood 2, as they represent the two distinctive PCT peaks that occur during the reflood phase for the Unit 1 BELOCA Code Qualification Document methodology. The Unit 2 BELOCA reports only one PCT value consistent with the BELOCA ASTRUM methodology.

<u>SBLOCA</u>	<u>BELOCA</u>	
	<u>Reflood 1</u>	<u>Reflood 2</u>
Unit 1: 1391°F (no change)	2005°F (no change)	2095°F (no change)
Unit 2: 1288°F (no change)	2097°F (no change)	

The PCT values remain within the 2200°F limit specified in 10 CFR 50.46. However, because Unit 1 and Unit 2 BELOCA have a total PCT margin allocation that is currently greater than 50°F, and in order to coordinate with the 24-month fuel cycle project schedule, PG&E will complete the Unit 1 BELOCA reanalysis and provide the updated PCT results to the NRC by December 2016, as stated in

PG&E Letter DCL-12-102. Also, PG&E will complete the Unit 2 BELOCA reanalysis and provide the updated PCT results to the NRC by December 2016.

**DCPP UNIT 1 PEAK CLADDING TEMPERATURE MARGIN UTILIZATION**

<u>SMALL-BREAK LOCA</u>	<u>PG&amp;E Letter<sup>1</sup></u>
A. ANALYSIS OF RECORD	PCT = 1391°F    DCL-09-057
B. PRIOR 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>	
1. None	ΔPCT = 0°F
C. 10 CFR 50.46 ECCS MODEL ASSESSMENTS THIS YEAR	
1. None	ΔPCT = 0°F
D. SUM OF 10 CFR 50.46 CHANGES	
1. Net Sum of 10 CFR 50.46 PCT Changes	ΔPCT = 0°F
2. Absolute Sum of 10 CFR 50.46 PCT Changes	ΔPCT = 0°F
E. <b>Analysis of Record PCT (Line A) + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes</b>	1391°F

The sum of the PCT from the most recent analysis of record using an acceptable evaluation model and the estimates of the net PCT effect for changes and errors identified since this analysis remains less than 2200°F.

<sup>1</sup> For those issues that have been previously reported under 10 CFR 50.46, a PG&E letter number is listed.

<sup>2</sup> Only permanent assessments of PCT margin are included. Temporary PCT allocations that address current LOCA model issues are not considered with respect to 10 CFR 50.46 reporting requirements.

**DCPP UNIT 1 PEAK CLADDING TEMPERATURE MARGIN UTILIZATION**

<u>BELOCA</u>	Reflood 1	Reflood 2	<u>PG&amp;E Letter</u> <sup>1</sup>
A. ANALYSIS OF RECORD	1900°F	1860°F	DCL-05-146
	<u>ΔPCT</u>	<u>ΔPCT</u>	
B. PRIOR 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>			
1. Revised blowdown heatup uncertainty distribution.	5°F	5°F	DCL-05-086
2. HOTSPOT Fuel Relocation Error.	10°F	0°F	DCL-07-071
3. Replacement Steam Generators	75°F	71°F	DCL-09-057
4. 230 kV Degraded Voltage Event	0°F	39°F	DCL-11-082
C. 10 CFR 50.46 ECCS MODEL ASSESSMENTS THIS YEAR			
1. Performance and Design (PAD) 4.0 Implementation	-118°F	-118°F	DCL-12-102
2. Fuel thermal conductivity degradation (TCD) and Peaking Factor Burndown	133°F	238°F	DCL-12-102
D. SUM OF 10 CFR 50.46 CHANGES			
1. Net Sum of PCT Changes	105°F	235°F	
2. Absolute Sum of PCT Changes	341°F	471°F	
E. <b>Analysis of Record PCT (Line A) + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes</b>	<hr/> 2005°F	<hr/> 2095°F	

The sum of the PCT from the most recent analysis of record using an acceptable evaluation model and the estimates of the net PCT effect for changes and errors identified since this analysis remains less than 2200°F.

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<sup>2</sup> Only permanent assessments of PCT margin are included. Temporary PCT allocations that address current LOCA model issues are not considered with respect to 10 CFR 50.46 reporting requirements.

**DCPP UNIT 2 PEAK CLADDING TEMPERATURE MARGIN UTILIZATION**

<u>SBLOCA</u>	<u>PG&amp;E Letter</u> <sup>1</sup>
A. ANALYSIS OF RECORD	PCT = 1288°F DCL-08-061
B. PRIOR 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>	
1. None	ΔPCT = 0°F
C. 10 CFR 50.46 ECCS MODEL ASSESSMENTS THIS YEAR	
1. None	ΔPCT = 0°F
D. SUM OF 10 CFR 50.46 CHANGES	
1. Net Sum of 10 CFR 50.46 PCT Changes	ΔPCT = 0°F
2. Absolute Sum of 10 CFR 50.46 PCT Changes	ΔPCT = 0°F
<b>E. Analysis of Record PCT (Line A) + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes</b>	<hr style="width: 10%; margin: 0 auto;"/> 1288°F

The sum of the PCT from the most recent analysis of record using an acceptable evaluation model and the estimates of the net PCT effect for changes and errors identified since this analysis remains less than 2200°F.

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<sup>2</sup> Only permanent assessments of PCT margin are included. Temporary PCT allocations that address current LOCA model issues are not considered with respect to 10 CFR 50.46 reporting requirements.

**DCPP UNIT 2 PEAK CLADDING TEMPERATURE MARGIN UTILIZATION**

<u>BELOCA</u>			<u>PG&amp;E Letter</u> <sup>1</sup>
A.	ANALYSIS OF RECORD	PCT=	1872°F DCL-07-071
B.	PRIOR 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>		
	1. HOTSPOT Fuel Relocation Error.	ΔPCT=	0°F DCL-07-071
	2. 230 kV Degraded Voltage Event	ΔPCT=	16°F DCL-11-082
C.	10 CFR 50.46 ECCS MODEL ASSESSMENTS THIS YEAR		
	1. Fuel TCD and Peaking Factor Burndown	ΔPCT:	209°F DCL-12-102
D.	SUM OF 10 CFR 50.46 CHANGES		
	1. Net Sum of 10 CFR 50.46 PCT Changes	ΔPCT=	225°F
	2. Absolute Sum of 10 CFR 50.46 PCT Changes	ΔPCT=	225°F
E.	<b>Analysis of Record PCT (Line A) + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes</b>		<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> 2097°F

The sum of the PCT from the most recent analysis of record using an acceptable evaluation model and the estimates of the net PCT effect for changes and errors identified since this analysis remains less than 2200°F.

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<sup>2</sup> Only permanent assessments of PCT margin are included. Temporary PCT allocations that address current LOCA model issues are not considered with respect to 10 CFR 50.46 reporting requirements.