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July 23, 2007

PG&E Letter DCL-07-071

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
Diablo Canyon Units 1 and 2
10 CFR 50.46 Annual Report of Emergency Core Cooling System Evaluation Model
Changes for 2006

Dear Commissioners and Staff:

Pursuant to 10 CFR 50.46, this letter 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 (PG&E) Diablo Canyon Power Plant (DCPP), Units 1 and 2.

There have been no changes in the Unit 1 and Unit 2 small-break loss-of-coolant accident (SBLOCA) PCT results since the last annual update. The last update was provided in PG&E Letter DCL-06-088, "10 CFR 50.46 Annual Report for 2005 of Emergency Core Cooling System Evaluation Model Changes," dated July 24, 2006.

Per the commitment identified in PG&E Letter DCL-00-134, "Revised Schedule for Large-Break Loss-of-Coolant Accident Reanalysis" (BELOCA), dated October 19, 2000, PG&E has performed a BELOCA reanalysis for Unit 1. The reanalysis was performed using the Westinghouse superposition step methodology approved by the NRC in License Amendment (LA) 191.

PG&E performed a plant-specific BELOCA analysis for Unit 2 using the accepted methodology and the Westinghouse Automated Statistical Treatment Uncertainty Method (ASTRUM). This analysis explicitly incorporates the Unit 2 reactor vessel design changes, and employs the methods approved in LA 192.

The summary of the updated PCT margin allocations and their bases are provided in the enclosure. The Unit 1 SBLOCA and BELOCA PCT Margin Utilization sheets are provided in Attachment A. The Unit 2 SBLOCA and BELOCA PCT Margin Utilization Sheets are provided in Attachment B. The ECCS evaluation model changes that have occurred since the last annual report are summarized in Attachment C.

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The new PCT values remain within the 2200°F limit specified in 10 CFR 50.46. There are no new or revised regulatory commitments in this report.

If you have questions regarding this submittal please contact Mr. Mark Mayer at 805-545-4674.

Sincerely,

A handwritten signature in black ink, appearing to read 'Donna Jacobs'.

Donna Jacobs
Vice President - Nuclear Services

ddm/A0674893/R0291595/A0587448

Enclosure

cc/enc: Terry W. Jackson, NRC Senior Resident Inspector
Bruce S. Mallett, NRC Region IV
Sandra Shewry, California Department of Health Services
Alan B. Wang, 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 (PG&E) Diablo Canyon Power Plant (DCPP), Units 1 and 2. This report is based on changes described in the following Westinghouse 10 CFR 50.46 notification letters:

Westinghouse Letter LTR-LIS-07-253, "10 CFR 50.46 Annual Notification and Reporting for 2006," dated April 19, 2007.

Westinghouse Letter LTR-LIS-07-374, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Diablo Canyon Units 1 and 2," dated May 31, 2007.

Attachment A to this enclosure provides DCPP 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 to this enclosure provides DCPP Unit 2 SBLOCA and BELOCA PCT Margin Utilization Sheets. There have been no changes in the Units 1 and 2 SBLOCA PCT results since the last annual update as presented in PG&E Letter DCL-06-088, "10 CFR 50.46 Annual Report for 2005 of Emergency Core Cooling System Evaluation Model Changes," dated July 24, 2006.

Per the commitment identified in PG&E Letter DCL-00-134, "Revised Schedule for Large-Break Loss-of-Coolant Accident Reanalysis," dated October 19, 2000, PG&E has performed a BELOCA reanalysis for Unit 1. The reanalysis was performed using the Westinghouse superposition step methodology approved by the NRC on March 11, 2004. PG&E Letter DCL-05-146, "License Amendment Request 05-07, Revision to Technical Specification (TS) 5.6.5, 'Core Operating Limits Report (COLR)'," dated December 16, 2005, submitted a License Amendment Request which would revise the Unit 1 TS 5.6.5 to incorporate the Westinghouse superposition step methodology into the licensing basis and establish a new BELOCA analysis of record. This License Amendment (LA) 191 has been implemented and the BELOCA analysis of record has been updated for Unit 1. Additionally, as discussed in the enclosed report, PG&E has also performed a plant-specific analysis for Unit 2 using the accepted methodology established in WCAP-12945-P-A, "Code Qualification Document for Best Estimate LOCA Analysis," dated 1998, and WCAP-16009-P-A, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment Uncertainty Method (ASTRUM)," dated 2005. This analysis explicitly incorporates the Unit 2 reactor vessel design changes and was submitted for NRC review in PG&E Letter DCL-06-006, "License Amendment Request 06-02 Revision to Technical Specification 5.6.5, 'Core Operating Limits Report

(COLR),” dated January 13, 2006. LA 192 has been implemented, and the BELOCA analysis of record has been updated for Unit 1.

The summary of the updated PCT margin allocations and their bases are provided in the enclosure, and the final net PCT values are listed below for each unit. It should be noted that two PCT values are reported for the BELOCA consistent with the current Westinghouse PCT tracking methodology. The two large-break 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 methodology, while the Unit 2 ASTRUM methodology reports only one PCT value.

<u>Small-Break LOCA</u>	<u>Best Estimate Large-Break LOCA</u>	
	<u>Reflood 1</u>	<u>Reflood 2</u>
Unit 1: 1352°F (no change)	1915°F	1865°F
Unit 2: 1375°F (no change)	1805°F	

The new PCT values remain within the 2200°F limit specified in 10 CFR 50.46. The Unit 1 SBLOCA and BELOCA PCT Margin Utilization sheets are provided in Attachment A. The Unit 2 SBLOCA and BELOCA PCT Margin Utilization Sheets are provided in Attachment B. The ECCS evaluation model changes that have occurred since the last annual report are summarized in Attachment C.

DCPP UNIT 1 PEAK CLADDING TEMPERATURE MARGIN UTILIZATION

SMALL-BREAK LOCA

PG&E Letter¹

A.	ANALYSIS OF RECORD	PCT =	1304°F	DCL-99-096
B.	PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS ²			
1.	NOTRUMP Mixture Level Tracking/Region Depletion Errors	ΔPCT =	13°F	DCL-00-107
2.	NOTRUMP Bubble Rise/Drift Flux Model Inconsistency Corrections	ΔPCT =	35°F	DCL-04-094
C.	10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS			
1.	None	ΔPCT =	0°F	
D.	OTHER MARGIN ALLOCATIONS			
1.	None	ΔPCT =	0°F	

LICENSING BASIS PCT + MARGIN ALLOCATION PCT = 1352°F

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

² 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>BEST ESTIMATE LARGE-BREAK LOCA</u>				<u>PG&E Letter¹</u>
		Reflood 1	Reflood 2	
A.	ANALYSIS OF RECORD	1900°F	1860°F	DCL-05-146
B.	PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS ²	<u>ΔPCT</u>	<u>ΔPCT</u>	
1.	Revised blowdown heatup uncertainty distribution.	5°F	5°F	DCL-05-086
2.	HOTSPOT Fuel Relocation Error.	10°F	0°F	This letter in Attachment C
C.	10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS			
1.	None	0°F	0°F	
D.	OTHER MARGIN ALLOCATIONS			
1.	None	<u>0°F</u>	<u>0°F</u>	
LICENSING BASIS PCT + MARGIN ALLOCATION PCT =		1915°F	1865°F	

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

² 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>SMALL-BREAK LOCA</u>		<u>PG&E Letter¹</u>
A. ANALYSIS OF RECORD	PCT = 1293°F	DCL-99-096
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS ²		
1. NOTRUMP Mixture Level Tracking/Region Depletion Errors	Δ PCT = 13°F	DCL-00-107
2. Upflow Conversion / Upper Head Temperature Reduction	Δ PCT = 69°F	DCL-06-088
C. 10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS		
1. None	Δ PCT = 0°F	
D. OTHER MARGIN ALLOCATIONS		
1. None	Δ PCT = 0°F	

LICENSING BASIS PCT + MARGIN ALLOCATION PCT = 1375°F

¹ For those issues that have been previously reported under 10 CFR 50.46, a PG&E Letter number is listed.

² 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>BEST ESTIMATE LARGE-BREAK LOCA</u>		<u>PG&E Letter¹</u>
	Reflood	
A. ANALYSIS OF RECORD	1872°F	DCL-06-006
	<u>ΔPCT</u>	
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS ²		
1. HOTSPOT Fuel Relocation Error	0°F	This letter in Attachment C
C. 10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS		
1. None	0°F	
D. OTHER MARGIN ALLOCATIONS		
1. None	<u>0°F</u>	
LICENSING BASIS PCT + MARGIN ALLOCATION PCT =	1872°F	

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

² 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.

CURRENT EMERGENCY CORE COOLING SYSTEM MODEL CHANGES AND ERRORS

Best Estimate Loss-of-Coolant Accident (BELOCA)

HOTSPOT FUEL RELOCATION (Non-Discretionary Change)

In the axial node where burst is predicted to occur, a fuel relocation model in HOTSPOT is used to account for the likelihood that additional fuel pellet fragments above that elevation may settle into the burst region. It was discovered that the effect of fuel relocation on local linear heat rate was being calculated, but then cancelled out later in the coding. The Unit 1 BELOCA evaluation method analysis was assessed on a plant-specific basis, via the HOTSPOT reanalysis of a representative WCOBRA/TRAC case using the corrected code version at the burst elevation/burst model enabled sub-case. The HOTSPOT 95 percentile probability PCT results were used to establish the plant-specific PCT penalty. The plant-specific PCT penalty was 10°F for Reflood 1 and 0°F for Reflood 2 for the Diablo Canyon Unit 1 analysis.

The Unit 2 ASTRUM evaluation method was assessed on a plant-specific basis, via the reanalysis of all of the burst cases from the original HOTSPOT calculations using the corrected HOTSPOT code version. The estimated effect of this error correction is 0°F for the Diablo Canyon Unit 2 ASTRUM analysis.

Small-Break Loss-of-Coolant Accident (SBLOCA)

None.