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PG&E Letter DCL-00-051

U.S. Nuclear Regulatory Commission  
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Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2  
10 CFR 50.46 30-Day Report of Emergency Core Cooling System Evaluation  
Model Changes

Dear Commissioners and Staff:

Pursuant to 10 CFR 50.46, this letter provides a 30-day report of changes in the Westinghouse emergency core cooling system (ECCS) evaluation models that affect peak cladding temperature (PCT) calculations for Diablo Canyon Power Plant (DCPP), Units 1 and 2. Because the absolute value of the sum of these new PCT margin allocations exceeds 50 °F due to a new Westinghouse PCT monitoring process for Best Estimate Loss of Coolant Accident (BELOCA) (Reflood 1 and Reflood 2), they can be considered "significant" in accordance with 10 CFR 50.46. The previous best estimate large-break loss of coolant accident (LBLOCA) PCT of 2034 °F reported in PG&E Letter DCL-99-096 was based on only the limiting reflood point. The report below is based on the new Westinghouse PCT monitoring process for BELOCA.

The evaluation model changes, along with the current PCT margin utilization, are provided in the enclosure. The new PCT values are as follows:

	<u>Small-Break LOCA</u>	<u>Best Estimate LBLOCA</u>	
		Reflood 1	Reflood 2
DCPP Unit 1:	1304 °F	2009 °F	1964 °F
DCPP Unit 2:	1293 °F	2009 °F	1964 °F

These new PCT values remain below the PCT limit of 2200 °F specified in 10 CFR 50.46. As indicated in PG&E Letter DCL-99-096, PG&E proposes to perform reanalyses for LBLOCA within the next five years from the date of the letter.

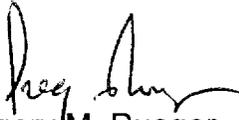
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Sincerely,



  
Gregory M. Rueger

cc: Steven D. Bloom  
Ellis W. Merschoff  
David L. Proulx  
Diablo Distribution

Enclosure

**30-DAY REPORT OF EMERGENCY CORE COOLING SYSTEM EVALUATION  
MODEL CHANGES THAT AFFECT PEAK CLADDING TEMPERATURE**

Pursuant to 10 CFR 50.46, this enclosure provides a 30-day report of changes in the Westinghouse emergency core cooling system (ECCS) evaluation models that affect peak cladding temperature (PCT) calculations for Diablo Canyon Power Plant (DCPP), Units 1 and 2. This report is based on changes described in the Westinghouse 10 CFR 50.46 notification letter PGE-00-506, dated February 23, 2000 (received on March 8, 2000).

In this letter, Westinghouse indicated that Westinghouse has enacted a process starting in model year 1999 to monitor both Reflood 1 (R1) and Reflood 2 (R2) Best Estimate large break loss of coolant accident (LBLOCA) PCTs for 50.46 reporting purposes. Prior to 1999, only the limiting reflood point was explicitly monitored. Using the extra detail for the R1/R2 breakdown, Westinghouse determined that the 1997 Intercell Force Gap Numbering Error of 67 °F, which was reported in PG&E Letter DCL-98-101, can be refined. The Diablo Canyon R1 PCT of 1976 °F is the limiting analysis of record (AOR) case, with an R2 PCT of 1964 °F. When the PCT penalty for the Gap Numbering error was calculated, the higher of the R1 and R2 PCT penalties was conservatively applied to the limiting AOR case. The R1 penalty of 33 °F was not applied and the R2 penalty of 67 °F was applied to the AOR (R1) PCT. With the new best estimate loss of coolant accident (BELOCA) PCT rackup process, Attachments A and B will show rackups for both the R1 and R2 PCTs.

Attachment A to this Enclosure provides DCPP Unit 1 small-break and large-break PCT Margin Utilization Sheets. Attachment B to this Enclosure provides DCPP Unit 2 small-break and large-break PCT Margin Utilization Sheets. The ECCS evaluation model changes that have resulted in new PCT margin allocations are provided in Attachment C. Because the sum of the absolute values of these new PCT margin allocations exceeds 50 °F due to a new Westinghouse PCT monitoring process for BELOCA (R1 and R2), they are considered "significant" in accordance with 10 CFR 50.46. Accordingly, this report is submitted within 30 days of receipt of these changes.

The new PCT values that are calculated in Attachments A and B are listed below. The previously reported LBLOCA PCT values are listed for comparison (Reference: PG&E Letter DCL-99-096).

	<u>Small-Break LOCA</u>	<u>Best Estimate LBLOCA</u>		<u>Previous</u>
		Reflood 1	Reflood 2	<u>Composite</u>
DCPP Unit 1:	1304 °F	2009 °F	1964 °F	2043 °F
DCPP Unit 2:	1293 °F	2009 °F	1964 °F	2043 °F

**DIABLO CANYON POWER PLANT UNIT 1 PEAK CLADDING  
TEMPERATURE MARGIN UTILIZATION**

<b><u>SMALL-BREAK LOSS OF COOLANT ACCIDENT (LOCA)</u></b>	<b><u>PG&amp;E Letter<sup>1</sup></u></b>
A. ANALYSIS OF RECORD	PCT = 1304 °F DCL-99-096
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>	
1. None	$\Delta$ PCT = 0 °F
C. 10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS	
1. None	$\Delta$ PCT = 0 °F
D. OTHER MARGIN ALLOCATIONS	
1. None	$\Delta$ PCT = 0 °F

**LICENSING BASIS PEAK CLADDING TEMPERATURE (PCT) + MARGIN  
ALLOCATION PCT = 1304°F**

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

<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.

**DIABLO CANYON POWER PLANT UNIT 1 PEAK CLADDING  
 TEMPERATURE MARGIN UTILIZATION**

<b><u>BEST ESTIMATE LARGE-BREAK LOCA</u></b>	<b>Reflood 1</b>	<b>Reflood 2</b>	<b><u>PG&amp;E Letter<sup>1</sup></u></b>
A. ANALYSIS OF RECORD	1976°F	1964°F	DCL-99-096
	$\Delta$ PCT =	$\Delta$ PCT =	
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>			
1. Intercell Force Gap Numbering Error	33°F	67°F	
2. Vessel Channel DX Error (1998)	0°F	-67°F	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	0°F	0°F	
<b>LICENSING BASIS PCT + MARGIN ALLOCATION PCT</b>	<b>2009°F</b>	<b>1964°F</b>	

**DIABLO CANYON POWER PLANT UNIT 2 PEAK CLADDING  
TEMPERATURE MARGIN UTILIZATION**

<b><u>SMALL-BREAK LOSS OF COOLANT ACCIDENT (LOCA)</u></b>	<b><u>PG&amp;E Letter<sup>1</sup></u></b>
A. ANALYSIS OF RECORD	PCT = 1293°F DCL-99-096
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>	
1. None	$\Delta$ PCT = 0 °F
C. 10 CFR 50.59 AND 10 CFR 50.92 SAFETY EVALUATIONS	
1. None	$\Delta$ PCT = 0 °F
D. OTHER MARGIN ALLOCATIONS	
1. None	$\Delta$ PCT = 0 °F

**LICENSING BASIS PEAK CLADDING TEMPERATURE (PCT) + MARGIN  
ALLOCATION PCT = 1293°F**

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

<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.

**DIABLO CANYON POWER PLANT UNIT 2 PEAK CLADDING  
 TEMPERATURE MARGIN UTILIZATION**

<b><u>BEST ESTIMATE LARGE-BREAK LOCA</u></b>			<b><u>PG&amp;E Letter<sup>1</sup></u></b>
	Reflood 1	Reflood 2	
A. ANALYSIS OF RECORD	1976°F	1964°F	DCL-99-096
	$\Delta$ PCT =	$\Delta$ PCT =	
B. PERMANENT 10 CFR 50.46 ECCS MODEL ASSESSMENTS <sup>2</sup>			
1. Intercell Force Gap Numbering Error	33°F	67°F	
2. Vessel Channel DX Error (1998)	0°F	-67°F	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	0°F	0°F	
<b>LICENSING BASIS PCT + MARGIN ALLOCATION PCT</b>	2009°F	1964°F	

## **CURRENT EMERGENCY CORE COOLING SYSTEM MODEL CHANGES AND ERRORS**

### 1. Vessel Channel DX Error

Incorrect cell height is used in calculating gap flow wall friction and interfacial drag coefficients at gap level J. The error is that only cell 1DX value is used rather than cell heights specific to each level, 1 through J.

In 1998 Westinghouse annual report to PG&E, PGE-99-526, there were no PCT penalty items imparted into the Diablo Canyon large break loss of coolant accident peak cladding temperature sheet. However, upon closer inspection, Westinghouse determined that there was a generic item "Vessel Channel DX Error" that had been conservatively assessed as no impact for Diablo Canyon. Under the current monitoring of both Reflood 1 (R1) and Reflood 2 (R2) separately, the R1 impact of the Vessel Channel DX Error was a minor benefit, treated as 0 °F impact and the R2 impact was a large benefit, that is judged to offset the 67 °F penalty originally assessed for the Gap Numbering Error.