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PG&E Letter DCL-09-057

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 2008

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 2 small-break loss-of-coolant accident (SBLOCA) PCT results or the large break best estimate loss of coolant accident (BELOCA) PCT results since the last annual update. The last update was provided in PG&E Letter DCL-08-061, "10 CFR 50.46 Annual Report of Emergency Core Cooling System Evaluation Model Changes for 2007," dated July 23, 2008.

Replacement steam generators (RSGs) were recently installed during the Unit 1 Fifteenth Refueling Outage which concluded in April of this year. In support of this design change, a new SBLOCA analysis was performed using the previously approved NOTRUMP methodology. This new analysis of record for Unit 1 has been implemented in accordance with 10 CFR 50.59. Additionally, an evaluation of the impact of the RSGs has been performed for the Unit 1 BELOCA analysis of record, and appropriate PCT margin has been assigned to bound this design change.

A 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. Steve Baker at 805-545-6742.

Sincerely,

James R. Becker
Site Vice President

ddm/2254/50041328
Enclosure
cc/enc: Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Alan B. Wang, NRR Project Manager
Diablo Distribution

ANNUAL REPORT OF EMERGENCY CORE COOLING SYSTEM (ECCS) EVALUATION MODEL CHANGES FOR PEAK CLADDING TEMPERATURE

Pursuant to 10 CFR 50.46, this enclosure provides an annual report of changes in the Westinghouse 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 letter; Westinghouse Letter LTR-LIS-09-72, "Diablo Canyon Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2008," dated January 29, 2009.

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 Unit 2 SBLOCA PCT results or the large break BELOCA since the last annual update. The last update was provided in PG&E Letter DCL-08-061, "10 CFR 50.46 Annual Report of Emergency Core Cooling System Evaluation Model Changes for 2007" dated July 23, 2008.

Replacement Steam Generators (RSGs) were recently installed during the Unit 1 Fifteenth Refueling Outage which concluded in April of this year. In support of this design change, a new SBLOCA analysis was performed using the previously approved NOTRUMP methodology. This new analysis of record for Unit 1 has been implemented in accordance with 10 CFR 50.59. Additionally, an evaluation of the impact of the RSGs has been performed for the Unit 1 BELOCA analysis of record and appropriate PCT margin has been assigned to bound this design change.

The summary of the updated PCT margin allocations and their bases are provided in the attachments, and the final net PCT values are listed below for each unit. It should be noted that two PCT values are reported for the Unit 1 BELOCA consistent with the current Westinghouse PCT tracking methodology. 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 methodology. The Unit 2 ASTRUM methodology reports only one PCT value.

	Small-Break LOCA	Large-Break Best Estimate LOCA	
		Reflood 1	Reflood 2
Unit 1:	1391°F	1990°F	1936°F
Unit 2:	1288°F (no change)	1872°F (no change)	

The new PCT values remain within the 2200°F limit specified in 10 CFR 50.46. The ECCS evaluation model changes that have occurred since the last annual report are summarized in Attachment C.

DIABLO CANYON POWER PLANT (DCPP) UNIT 1
PEAK CLADDING TEMPERATURE MARGIN UTILIZATION

SMALL-BREAK LOSS OF COOLANT ACCIDENT (LOCA)			Pacific Gas and Electric Company (PG&E) Letter[1]
A. ANALYSIS OF RECORD Peak Cladding Temperature (PCT)	PCT =	1391°F	This letter is in Attachment C
B. Prior 10 CFR 50.46 Emergency Core Cooling System (ECCS) Model Assessments[2]			
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. Analysis of Record PCT - Line A + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes		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 remain less than 2200°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.

DIABLO CANYON POWER PLANT (DCPP) UNIT 1
PEAK CLADDING TEMPERATURE MARGIN UTILIZATION

BEST ESTIMATE LARGE-BREAK LOSS OF COOLANT ACCIDENT (LOCA)			Pacific Gas and Electric Company (PG&E) Letter[1]
	Reflood 1	Reflood 2	
A. Analysis Of Record	1900°F	1860°F	DCL-05-146
Peak Cladding Temperature (PCT)	ΔPCT	ΔPCT	
B. Prior 10 CFR 50.46 Emergency Core Cooling System (ECCS) Model Assessments[2]			
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
C. 10 CFR 50.46 ECCS Model Assessments This Year			
1. Replacement Steam Generators	75°F	71°F	This letter is in Attachment C
D. Sum OF 10 CFR 50.46 Changes			
1. Net Sum of 10 CFR 50.46 PCT Changes	90°F	76°F	
2. Absolute Sum of 10 CFR 50.46 PCT Changes	90°F	76°F	
E. Analysis of Record PCT - Line A + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes	1990°F	1936°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 remain less than 2200°F.

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DIABLO CANYON POWER PLANT (DCPP) UNIT 2
PEAK CLADDING TEMPERATURE MARGIN UTILIZATION

SMALL-BREAK LOSS OF COOLANT ACCIDENT (LOCA)			Pacific Gas and Electric Company (PG&E) Letter[1]
A. Analysis Of Record Peak Cladding Temperature (PCT)	PCT =	1288°F	DCL-08-061
B. Prior 10 CFR 50.46 Emergency Core Cooling System (ECCS) Model Assessments[2]			
1. None	ΔPCT =	0°F	
C. 10 CFR 50.46 ECCS MODEL ASSESSMENTS THIS YEAR			
2. None	ΔPCT =	0°F	
D. SUM OF 10 CFR 50.46 CHANGES			
3. Net Sum of 10 CFR 50.46 PCT Changes	ΔPCT =	0°F	
4. Absolute Sum of 10 CFR 50.46 PCT Changes	ΔPCT =	0°F	
E. Analysis of Record PCT - Line A + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes		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 remain less than 2200°F.

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[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.

DIABLO CANYON POWER PLANT (DCPP) UNIT 2
PEAK CLADDING TEMPERATURE (PCT) MARGIN UTILIZATION

BEST ESTIMATE LARGE-BREAK LOCA			Pacific Gas and Electric Company (PG&E) Letter[1]
A. Analysis Of Record	PCT=	1872°F	DCL-07-071
B. PRIOR 10 CFR 50.46 Emergency Core Cooling System (ECCS) Model Assessments[2]			
1. HOTSPOT Fuel Relocation Error.	ΔPCT=	0°F	DCL-07-071
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. Analysis of Record PCT - Line A + Line D.1 Net Sum of 10 CFR 50.46 PCT Changes		1872°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 remain less than 2200°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 (ECCS) MODEL CHANGES AND ERRORS

Best Estimate Loss-of-Coolant Accident (BELOCA)

Unit 1 BELOCA Evaluation for Replacement Steam Generators (RSGs)

In support of the installation of RSGs during the recent Unit 1 Fifteenth Refueling Outage, an evaluation was performed to assess the impact of the RSG design change on the BELOCA analysis of record. Since the analysis of record was performed with original Model 51 SGs, this evaluation considered the design change associated with the installation of the Model Delta 54 RSGs. The WCOBRA/TRAC reference steady state and transient decks used in the Unit 1 analysis of record were modified to reflect the differences between the Model 51 and Model Delta 54 steam generators including the following:

Primary-to-secondary heat transfer area
Reactor coolant system volume
Steam generator primary-side flow area
Steam generator secondary-side water mass
Primary-side pressure drop

All the steam generators are assumed to be at a uniform SG tube plugging level of 15 percent, since a maximum is limiting. The current Diablo Canyon Power Plant Unit 1 licensing basis 95th percentile PCT has increased due to this design change. Modeling the RSGs resulted in a 75°F increase in the PCT during the Reflood 1 period, and a 71°F increase in the PCT during the Reflood 2 period.

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

Unit 1 SBLOCA Analysis with Replacement Steam Generators (RSGs)

Also, in support of the installation of RSGs, a new SBLOCA analysis of record was performed for Unit 1 using the previously approved NOTRUMP methodology. This new SBLOCA analysis explicitly modeled the RSGs and incorporated the ECCS model changes previously reported in DCL-08-061, "10 CFR 50.46 Annual Report of the Emergency Core Cooling System Evaluation Model Changes for 2007," such that there are currently no outstanding PCT assessments for this new SBLOCA analysis of record for Unit 1 which has been implemented in accordance with 10 CFR 50.59.