50-275

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 28, 1996

Mr. Gregory M. Rueger
Pacific Gas and Electric Company
NPG - Mail Code A10D
P.O. Box 770000
San Francisco, California 94177

SUBJECT: DIABLO CANYON 1: ASSESSMENT OF DIABLO CANYON SURVEILLANCE MATERIAL FOR ISSUANCE OF REVISION 1 OF THE REACTOR VESSEL INTEGRITY DATABASE

Dear Mr. Rueger:

By letter dated July 1, 1994, the NRC provided the Pacific Gas and Electric Company (PG&E) with a closeout letter to PG&E's response to Generic Letter (GL) 92-01, Revision 1, "Reactor Vessel Structural Integrity." In its closeout letter, the NRC informed PG&E that the Tables in Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials" (May 1988), should be used to determine the chemistry factors for the limiting beltline material in the Diablo Canyon Unit 1 (DC-1) reactor pressure vessel (RPV). By letter dated July 25, 1994, PG&E submitted a request to use the DC-1 surveillance capsule (SC) data to determine the chemistry factors for the limiting material in the DC-1 RPV.

For PWR licensees, 10 CFR 50.61 provides the requirements for protection against pressurized thermal shock (PTS). According to 10 CFR 50.61 the adjusted reference temperatures for beltline materials in the RPV may be calculated using the following formula:

$$RT_{NDT} = RT_{NDT(U)} + M + \Delta RT_{NDT} \quad (1),$$

where $RT_{NDT(U)}$ refers to the initial (unirradiated) reference temperature (°F) for the beltline material, ΔRT_{NDT} refers to a term (°F) that is to be added to the $RT_{NDT(U)}$ values to account for the shift in the reference temperature (°F) caused by irradiation of the beltline material, and M refers to an additional safety margin value (°F) to account for uncertainties in the method of predicting the RT_{NDT} values. The ΔRT_{NDT} for a given ferritic material is equal to the product of the fluence factor (FF, a function of the cumulative neutron flux that has occurred in the material), and the chemistry factor (CF, a function of the Cu and Ni alloying chemistry of the material as determined from CF Tables or calculated from credible surveillance data). Table 1 and Table 2 of 10 CFR 50.61 provide the methodology for calculating CFs from the amount of Cu and Ni in the absence of credible surveillance capsule (SC) data. Section 50.61 also provides the methodology that should be used when two or more sets of SCs have been tested for the materials in the beltline of the RPV, and the data from the SC sets have been determined to be credible in accordance with the credibility criteria of 10 CFR 50.61. Section 50.61 states that the SC data should be used to establish the CFs and margin values for the beltline materials, especially if the calculated CF from the SC data yields the more conservative final RT_{NDT} value for the material.

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cc w/encl:
NRC Resident Inspector
Diablo Canyon Nuclear Power Plant
c/o U.S. Nuclear Regulatory Commission
P. O. Box 369
Avila Beach, California 93424

Dr. Richard Ferguson, Energy Chair
Sierra Club California
1100 11th Street, Suite 311
Sacramento, California 95814

Ms. Nancy Culver
San Luis Obispo
Mothers for Peace
P. O. Box 164
Pismo Beach, California 93448

Ms. Jacquelyn C. Wheeler
P. O. Box 164
Pismo Beach, California 93448

Managing Editor
The County Telegram Tribune
1321 Johnson Avenue
P. O. Box 112
San Luis Obispo, California 93406

Chairman
San Luis Obispo County Board of
Supervisors
Room 370
County Government Center
San Luis Obispo, California 93408

Mr. Truman Burns
Mr. Robert Kinosian
California Public Utilities Commission
505 Van Ness, Room 4102
San Francisco, California 94102

Mr. Steve Hsu
Radiologic Health Branch
State Department of Health Services
Post Office Box 942732
Sacramento, California 94232

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Harris Tower & Pavillion
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Christopher J. Warner, Esq.
Pacific Gas & Electric Company
Post Office Box 7442
San Francisco, California 94120

Mr. Warren H. Fujimoto
Vice President and Plant Manager
Diablo Canyon Nuclear Power Plant
P. O. Box 56
Avila Beach, California 93424

Diablo Canyon Independent Safety
Committee
ATTN: Robert R. Wellington, Esq.
Legal Counsel
857 Cass Street, Suite D
Monterey, California 93940

ENCLOSURE

SUMMARY OF CHANGES TO THE PTS SUMMARY FILE FOR DIABLO CANYON UNIT 1 RESULTING FROM CHANGING THE SURVEILLANCE CAPSULE S DATA FOR THE WELD HEAT 27204 MATERIAL TO THE NONCREDIBLE "N" DESIGNATION

PTS SUMMARY FILE ENTRY	PREVIOUS VALUE	LATEST ASSESSED VALUE
RT_{NDT} at EOL	216°F	250°F
$RT_{NDT(U)}$	-56°F	-56°F
Method of Determining $RT_{NDT(U)}$	Generic Values	Generic Values
ΔRT_{NDT} at EOL	228.0°F	240.2°F
ID Neutron Fluence at EOL (E19 n/cm^2)	1.32	1.32
Fluence Factor (FF) at EOL	1.077	1.077
Chemistry Factor (CF)	211.70°F	223.00°F
Method of Determining CF	Calculated (from SC data)	Table
Margin	44.0	65.5
Method of Determining Margin	Table (and SC data)	Table

DIABLO CANYON 1 AND SURVEILLANCE CAPSULE S DATA:

1. CAPSULE S LEAD FACTOR = 3.57
2. SURVEILLANCE CAPSULE FLUENCE = 0.298 X 10^{19} N/CM^2
3. LIMITING RPV MATERIAL IDENTIFICATION: LOWER SHELL AXIAL WELD NO. 3-442C
4. LIMITING RPV MATERIAL HEAT IDENTIFICATION: 27204

The NRC staff has reviewed the SC data from the DC-1 RPV. The staff has confirmed that Longitudinal Weld No. 3-442C is the limiting beltline material in the DC-1 RPV. The material for this weld was fabricated from material heat No. W5214. Surveillance Capsules S and Y were the only SCs pulled from DC-1 that contained weld material fabricated from material heat 27204. The staff has determined that the data for Capsule S is not credible. The staff's determination is consistent with PG&E's letter of September 5, 1993, to the staff. As a result, the staff recommends using Tables 1, "Chemistry Factors For Weld Metals, °F," for determining the CF for Longitudinal Weld No. 3-442C in the DC-1 RPV.

The attachment provides a summary of the changes to the PTS summary report for DC-1 if Table 1 of 10 CFR 50.61 is used to determine the CF for Longitudinal Weld No. 3-442C and if the criteria of 10 CFR 50.61 are used to determine the margin value for Longitudinal Weld No. 3-442C. It should be noted, however, that the DC-1 RPV will still meet the requirements of 10 CFR 50.61 even with the changes to the CF and margin term values. It should also be noted that the changes to the data could also affect the pressure-temperature (P-T) limit curves and low-temperature overpressure (LTOP) limit for DC-1. PG&E is also requested to review the changes to the data in order to determine the effects of the changes on the P-T limit curves and LTOP system setpoint for DC-1.

Sincerely,
Original signed by:
Steven D. Bloom, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-275

Enclosure: Summary of Changes

cc w/encl: See next page

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