



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 10 TO FACILITY OPERATING LICENSE NO. DPR-80
AND AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. DPR-82
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-275 AND 50-323

INTRODUCTION

By letter dated June 10, 1986 Pacific Gas and Electric Company (the licensee) made application to amend Facility Operating Licenses DPR-80 and DPR-82 for Diablo Canyon Units 1 and 2 to reflect the Cycle 2 refueling and related Technical Specification changes. The Cycle 2 reload core will utilize 68 new Westinghouse fuel assemblies and 448 fresh burnable absorber rods. The new fuel assemblies are of the same mechanical, nuclear, and thermal hydraulic design as Standard Fuel Assemblies except for some minor mechanical design changes. The licensee references the approved Westinghouse reload methodology outlined in "Westinghouse Reload Safety Evaluation Methodology" (WCAP-9272 P-A, July 1985) for the Cycle 2 core analyses. We consider the Cycle 2 reload core acceptable.

The proposed Technical Specification changes include (1) redefining the moderator temperature coefficient limits, (2) revising the F^R -delta-H partial power multiplier, and (3) deleting the design feature description of the total weight of uranium in a fuel rod. Changes (1) and (3) apply to Units 1 and 2. Change (2) applies to Unit 1 only.

DISCUSSION AND EVALUATION

Moderate Temperature Coefficient (MTC)

The present Technical Specifications require the MTC to be zero or negative at all times while the reactor is critical. The licensee proposes to change Technical Specification Section 3/4.1.1.3 to allow a maximum positive MTC of $5 \times 10^{-5} \Delta k/k/^\circ F$ below 70% power, with the maximum positive MTC value decreasing linearly to $0 \Delta k/k/^\circ F$ between 70% and 100% power during beginning of life (BOL) operation. The licensee also proposes to revise Bases 3/4.1.1.3 to clarify the BOL Surveillance Requirements. The revision adds a requirement to verify that the MTC parameters are within these limits during startup testing at BOL. We consider this addition to Bases 3/4.1.1.3 acceptable.

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The licensee assessed the impact of a positive MTC on the accident analyses presented in Chapter 15 of the Diablo Canyon Units 1 and 2 updated FSAR. Those incidents which were found to be sensitive to positive MTC were re-analyzed. These are: (A) Uncontrolled Boron Dilution, (B) Uncontrolled RCCA Bank Withdrawal from a Subcritical Condition, (C) Uncontrolled RCCA Bank Withdrawal at Power, (D) Complete Loss of Forced Reactor Coolant Flow, (E) Single Reactor Coolant Pump Locked Rotor, (F) Loss of External Electrical Load and/or Turbine Trip, (G) Loss of Normal Feedwater/Loss of Offsite Power, (H) Rupture of a Main Feedwater Pipe, (I) Rupture of a Control Rod Drive Mechanism Housing (RCCA Ejection), and (J) Accidental RCS Depressurization. In general, these incidents cause the reactor coolant temperature to rise.

The licensee states that the re-analysis is based on the identical analysis methods, computer codes, and assumptions employed in the updated FSAR. The same safety criteria are used during re-analysis, e.g., DNBR limit, peak cladding temperature limit, and the 280 cal/gm fuel enthalpy limit. The results show that all the safety criteria are met for the proposed Technical Specification change of positive MTC, and no significant reduction in the safety margin is observed. We therefore conclude that the Technical Specification changes in Sections 3/4.1.1.3 and Bases 3/4.1.1.3 concerning a positive MTC are acceptable. This change did not affect GDC-11.

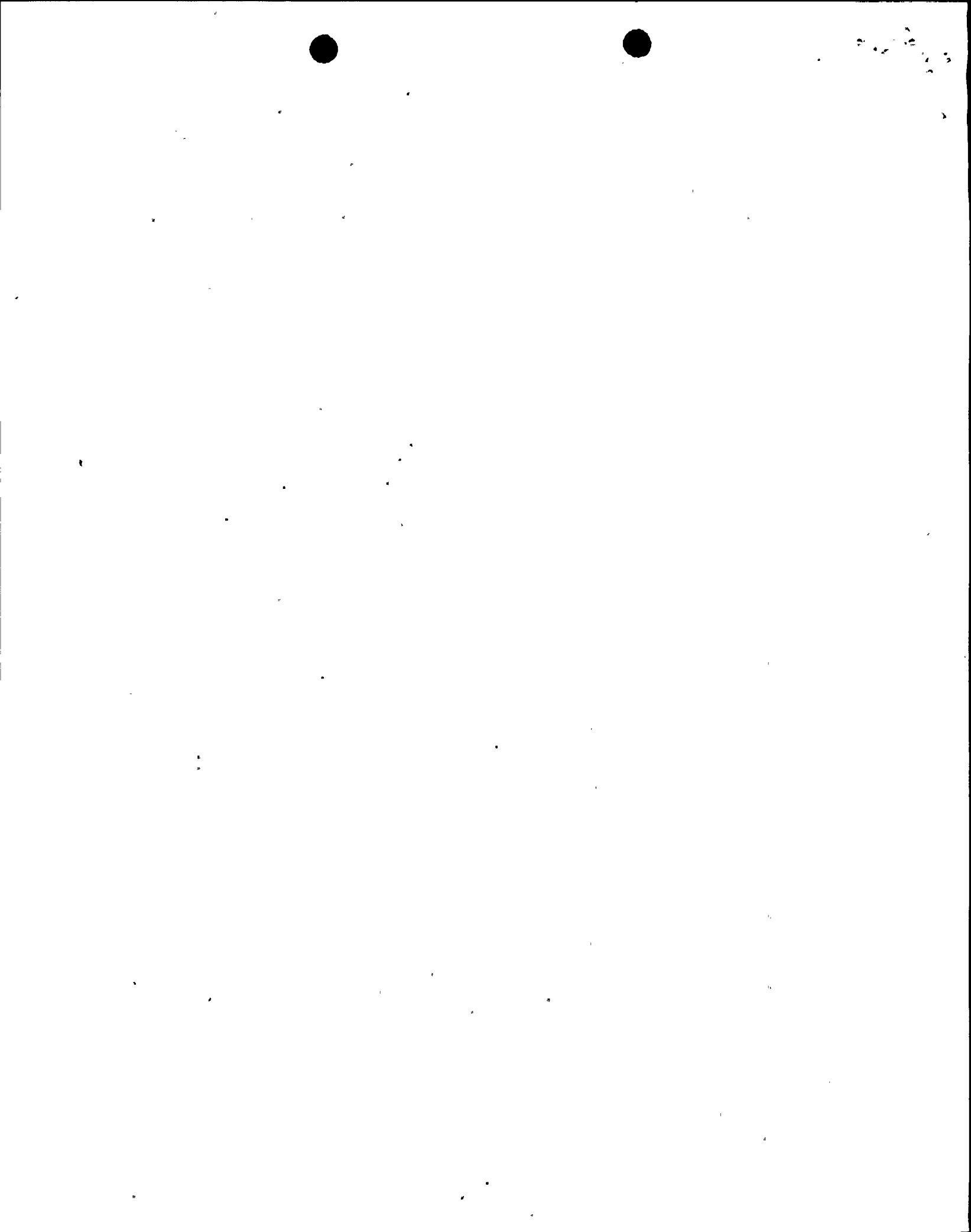
F^N-delta-H Partial Power Multiplier

The licensee proposes to change the F^N-delta-H partial power multiplier from 0.2 to 0.3 at low power. The change involves Technical Specification Section 3/4.2.3, Figure 3.2-3a, Bases 2.1.1, and Figure 2.1-1. The proposed revision would allow optimization of core loading patterns by minimizing the restriction on F^N-delta-H at lower power levels. The increase in the partial power multiplier from 0.2 to 0.3 has a direct impact on DNBR calculations. We have previously approved a 0.3 partial power multiplier for a number of operating plants including Turkey Point, Ginna, Trojan, Cook Unit 1, Zion, Indian Point Unit 3, Point Beach, and Surry.

The licensee assessed the impact of larger F^N-delta-H on thermal-hydraulic design, nuclear design, and accident conditions. The results showed that (1) the DNBR safety limit is not violated, (2) there is no impact on other nuclear design bases, and (3) overtemperature and overpower setpoints are not impacted by the proposed F^N-delta-H change for non-LOCA accidents and the F^N-delta-H increase has no effect on the LOCA analyses. We thus consider that the Technical Specification changes involving Section 3/4.2.3, Figure 3.2-3a, Bases 2.1.1, and Figure 2.1-1 of F^N-delta-H are acceptable.

Deleting The Design Feature of The Total Weight of Uranium in A Fuel Rod.

The licensee proposes to delete a design quantity describing the maximum total weight of uranium from Technical Specification Section 5.3. The licensee indicates that the total uranium weight is intended to be descriptive and has not been used as an input to any safety analysis. We agree with the licensee's statement. Therefore, we conclude that the deletion of total uranium weight from Technical Specification Section 5.3 is acceptable.



Revised ECCS Analysis

By letter dated August 19, 1986 from J. D. Shiffer (PG&E) to S. A. Varga (NRC), the licensee submitted a revised LOCA analysis for Unit 1 Cycle 2. The revised LOCA analysis uses the most up-to-date NRC-approved Westinghouse LOCA Evaluation Model (1981 Evaluation Model with BART). The BART model is an improved version of the 1981 Model and is documented in WCAP-9561-P and WCAP-10062. The BART model for this analysis has been modified to consider the effect of core thimbles, the hot assembly power correction, and the BART heat transfer model conservatisms. These modifications are documented in WCAP-9561-P Addendum 3, which is approved by NRC in a letter from C. E. Rossi (NRC) to E. P. Rahe (Westinghouse) dated August 25, 1986. The result shows that the calculated peak cladding temperature is well within the 2200°F limit. We therefore conclude that the revised LOCA analysis is acceptable for Diablo Canyon Unit 1 Cycle 2. This August 19, 1986 letter did not change the Technical Specifications and thus was not noticed.

We have reviewed the licensee's submittal regarding the Diablo Canyon Unit 1 Cycle 2 reload core, associated Technical Specification changes, and a revised LOCA analysis. We conclude that the reload core design, Technical Specification changes, and the revised LOCA analysis are acceptable for Diablo Canyon Unit 1 Cycle 2. We also conclude that the changes related to the moderator temperature coefficient limits and the total weight of uranium in a fuel rod are acceptable for Unit 2.

ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of the facilities components located within the restricted areas as defined in 10 CFR 20. The staff has determined that these amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: October 21, 1986

PRINCIPAL CONTRIBUTOR:

S. L. Wu

