



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. DPR-80  
AND AMENDMENT NO. 87 TO FACILITY OPERATING LICENSE NO. DPR-82  
PACIFIC GAS AND ELECTRIC COMPANY  
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-275 AND 50-323

1.0 INTRODUCTION

By letter of December 22, 1992, Pacific Gas and Electric Company (or the licensee) submitted a request for changes to the Technical Specifications (TS) for Diablo Canyon Power Plant (DCPP) Units 1 and 2. The proposed amendments would revise the Overtemperature Delta-T (OTDT) reactor trip setpoint (TS 2.2) as a result of a non-conservatism in the Westinghouse methodology used to calculate the  $f(\Delta I)$  penalty function for the OTDT reactor trip setpoint.

The proposed changes to TS 2.2.1 would change Note 1 to Table 2.2-1 to replace the  $f(\Delta I)$  penalty slope of 1.76% with 2.38% and the  $\Delta I$  deadband of -19% to +9% with -19% to +7%.

The setpoint changes in this license amendment request have been included in the setpoint study performed to support implementation of the Process Protection System Upgrade (Eagle 21). The Eagle 21 upgrade is to be implemented during the sixth refueling outages and placed in service during Cycle 7 for each unit.

A telecon was held with the licensee for additional clarification on January 5, 1994.

2.0 BACKGROUND

The design departure from nucleate boiling (DNBR) limit is set for protection against the DNB that could cause fuel damage. The OTDT reactor trip setpoint protects against fuel damage caused by DNB during normal operation, operational transients, or transient conditions arising from faults of moderate frequency.

The OTDT reactor trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transient delays from the core to temperature detectors (about 4 seconds).

The OTDT setpoint is a continuously calculated variable setpoint. Three plant parameters, RCS pressure,  $T_{avg}$ , and axial neutron flux distribution, are continuously monitored, and, as changes are detected, the reactor protection system automatically modifies the OTDT reactor trip setpoint.

The axial neutron flux distribution modifier (called the  $f(\Delta I)$  penalty function) is designed to provide protection against DNB for adverse power shapes that may occur during transient condition. The  $f(\Delta I)$  penalty function is calculated using the Core Thermal Limits and Axial Offset (AO) Limits.

The TS changes are proposed because Westinghouse notified PG&E that there was non-conservatism in the methodology used to calculate the penalty function,  $f(\Delta I)$ . The positive "wing" of the  $f(\Delta I)$  function may not provide a sufficiently large penalty for axial power shapes that have a large positive  $\Delta I$ .

### 3.0 EVALUATION

In TS Table 2.2-1 (Reactor Trip System Instrumentation Trip Setpoints), Note 1 (Overtemperature  $\Delta T$ ), for the current TS  $\Delta I$  deadband (-19% to +9%), the  $f(\Delta I)$  penalty function is zero, such that no reduction in the OTDT setpoint is necessary. Steady state operation within this deadband is desirable, as it is a good indication of a stable core. When not in the deadband, the  $f(\Delta I)$  increases and is subtracted from the calculated OTDT setpoint. Currently, for each percent that  $\Delta I$  exceeds +9%, the OTDT setpoint is automatically reduced by 1.76%, and for each percent that  $\Delta I$  becomes more negative than -19%, the OTDT setpoint is automatically reduced by 2.75% (TS Table 2.2-1).

For Unit 1, Cycle 5, Westinghouse determined that there was sufficient DNB margin (difference between the required DNBR design limit and the DNBR limit actually used in the DNB-limiting accident analysis) to accommodate the non-conservative  $f(\Delta I)$  slope.

However, for Unit 2, Cycle 5 standard (LOPAR) fuel, it was determined that insufficient DNB margin existed, therefore, Westinghouse calculated a new, more restrictive  $F_{\Delta H}^H$  limit of 1.5 to apply.

For Cycle 6, Units 1 and 2, which uses Vantage 5 fuel, Westinghouse determined that sufficient DNB margin exists using the current  $f(\Delta I)$  penalty.

For Cycle 7 (with Eagle 21), Units 1 and 2, with Vantage fuel, PG&E proposes to revise the  $f(\Delta I)$  penalty function per changes proposed in this license amendment request (LAR) to remove the non-conservatism. The methodology used in the general calculation of setpoints and  $\Delta I$  function is included in the approved Westinghouse report WCAP-8745-P-A used by the licensee. These changes to TS 2.2.1 would change Note 1 to Table 2.2-1 to replace the  $f(\Delta I)$  penalty slope of 1.76% with 2.38% and the  $\Delta I$  deadband of -19% to +9% with -19% to +7% (a more restrictive positive "wing").

The following is a summary of the action taken by PG&E for both Units to address the Westinghouse non-Conservatism.

	<u>Unit 1</u>	<u>Unit 2</u>
Cycle 5:	sufficient DNB margin available	limit $F_{AH}^N$ to 1.50 for LOPAR fuel
Cycle 6:	sufficient DNB margin available	sufficient DNB margin available
Cycle 7: (with Eagle 21)	revise $f(\Delta I)$ penalty function per changes proposed in this LAR	revise $f(\Delta I)$ penalty function per changes proposed in this LAR

A similar license amendment to change the  $f(\Delta I)$  penalty function to correct the Westinghouse non-conservatism was issued for Catawba Unit 2. These changes are based on the use of corrected methodology by Westinghouse. In addition, the Diablo Canyon LAR for Cycle 7 assumes implementation of the Process Protection System Upgrade (Eagle 21) which is to be installed during the Unit 1 and Unit 2 sixth refueling outages.

The staff finds these changes to be acceptable as the approved corrected methodology was used in the analysis and the previous non-conservatism was removed.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the California State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (58 FR 7003). Accordingly, the 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 the amendments.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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