

Docket No. 50-323

Mr. J. D. Shiffer, Vice President
Nuclear Power Generation
c/o Nuclear Power Generation, Licensing
Pacific Gas and Electric Company
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Dear Mr. Shiffer:

SUBJECT: LIFTING OF EXEMPTION FROM REQUIREMENT OF 10 CFR 50, SECTION 50.46

On March 3, 1986 the Commission granted an exemption for the Diablo Canyon Nuclear Power Plant, Unit 2 regarding a requirement in Section 50.46 of 10 CFR Part 50 for a plant specific calculated ECCS cooling performance with an approved model. The Commission granted the exemption on the conditions that:

1. The heat flux hot channel factor, F_q , shall not exceed 2.30,
2. all other operating conditions shall conform with the requirements of License No. DPR-82 and the associated Technical Specifications, and
3. Pacific Gas and Electric Company shall complete a revised plant specific ECCS analysis for Diablo Canyon Unit 2, in accordance with the schedule stated in its letter of February 21, 1986 and shall submit the results of such analysis no later than August 20, 1986.

Your letter of August 19, 1986 (DCL-86-246) submitted the results of an ECCS analysis for Diablo Canyon Unit 2 using a revised BART Evaluation Model. The staff has reviewed your submittal and finds that the analysis of the ECCS performance meets the requirements of 10 CFR 50.46 and Appendix K and that the results are satisfactory. We conclude that the conditions for the exemption have been met and, therefore, this exemption is no longer required and accordingly is lifted. The staff safety evaluation of your submittal and in support of our conclusion is attached as Enclosure 1.

Steven A. Varga, Director
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Enclosure:
As stated

cc: See next page

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ENCLOSURE

SAFETY EVALUATION REPORT

DIABLO CANYON UNIT 2

EMERGENCY CORE COOLING SYSTEM ANALYSIS

USING CORRECTED BART EVALUATION MODEL

DOCKET NO. 50-323

BACKGROUND

Diablo Canyon Unit 2 has been operating since March 3, 1986 with a one-time exemption to 10 CFR 50.46 (Ref. 1) which requires licensees to provide plant specific Loss of Coolant Accident (LOCA) analysis. LOCA calculations are done using an evaluation model approved by the NRC staff. The evaluation considers postulated loss-of-coolant accidents of various sizes, locations, and other properties sufficient to assure satisfactory performance. Two of the key criteria of 10 CFR 50.46 are that the peak cladding temperature not exceed 2200°F and that the total cladding oxidation not exceed 17 percent of total cladding thickness.

On August 19, 1986 the licensee submitted a plant specific LOCA evaluation (Ref. 2). This reanalysis became necessary when the actual average coolant temperature was found to be more bounding than the input assumptions in the analysis performed as part of the licensing basis of the plant, using a 1978 ECCS Evaluation Model. This resulted in a calculated peak cladding temperature greater than 2200°F. The reanalysis, performed in accordance with the Exemption, employed a revised ECCS BART Evaluation Model which is more accurate than the 1978 ECCS Model. The version of the BART Model used in the reanalysis corrected discrepancies noted in Board Notification BN-86-17, dated June 30, 1986 (Ref. 3). This revised BART Model was submitted to the NRC by Westinghouse on June 2, 1986 (Ref. 4). The staff review was completed and Topical Report WCAP 9561, Addendum 3, Revision 1, which provides the necessary corrections to the evaluation model, was accepted on August 25, 1986 (Ref. 5).

EVALUATION

The licensee's August 19, 1986 submittal provided a discussion of some of the input parameters used in the ECCS reanalysis. A value of 2.40 was assumed for the total core peaking factor, F_q , rather than 2.32 as used in the Diablo Canyon current Technical Specifications. The assumption of a higher peaking factor for the evaluation yields a higher peak cladding temperature and is, therefore, conservative. The reason for the licensee's use of $F_q = 2.40$ is to avoid a LOCA reanalysis if an increase in F_q should be requested in the future. For similar reasons, the reanalysis was performed assuming a steam generator tube plugging limit of 10 percent.

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In a telephone call on January 5, 1987 by the NRC staff and the licensee, details of the evaluation results were discussed (Ref. 6). The licensee confirmed that input parameters not specifically defined in the August 19, 1986 submittal are the same as those used in the latest Diablo Canyon Unit 2 FSAR Update.

The LOCA reanalysis was performed for the licensee by Westinghouse, using the revised BART Model, and completed on July 25, 1986. The licensee stated in the August 19, 1986 submittal that Westinghouse performed this reanalysis using the corrected version of the BART Model even though the analysis precedes the Board Notification which was dated July 30, 1986, and the corrections were not formally approved by the NRC until August 25, 1986. No changes were made from the version used for reanalysis and the version that was finally approved.

CONCLUSION

The staff has evaluated the licensee's submittal dated August 19, 1986 which provided a reanalysis of the Diablo Canyon Unit 2 LOCA analysis as required by the Exemption of March 3, 1986 (Ref. 1). The input assumptions used in the reanalysis are conservative and consistent with previously approved parameters. The BART Model used in the performance of the reanalysis has been corrected to resolve discrepancies found in previous versions of BART. The results indicate that the most severe LOCA is a double ended cold leg break with a discharge coefficient equal to 0.4. This yields a peak cladding temperature of 2077.7°F and total cladding oxidation of 7.22 percent. These results are satisfactory and satisfy the requirements of 10 CFR 50.46 and are, therefore, acceptable. The staff concludes that the conditions of the Exemption to Facility Operating License DPR-82 for Diablo Canyon Unit 2 have been met and, therefore, the Exemption can be lifted.

Principal Contributor:

R. Karsch

References

1. Letter from S. A. Varga (NRC) to J. D. Shiffer (PG&E), "Exemption from Requirement of 10 CFR 50, Section 50.46," March 3, 1986.
2. Letter from J. D. Shiffer (PG&E) to S. A. Varga (NRC), "ECCS Analysis Using NRC - Approved BART Evaluation Model," (DCL-86-246), August 19, 1986.
3. U. S. Nuclear Regulatory Commission, Board Notification BN-86-17, "Vessel Flux Reduction, Turkey Point Plant Units 3 and 4," June 30, 1980.
4. Letter from E. P. Rahe (Westinghouse) to H. Thompson (NRC) transmitting "WCAP-9561-P-A, Addendum 3: Thimble Modeling in Westinghouse ECCS Evaluation Model," dated June 2, 1986.
5. Letter from C. E. Rossi (NRC) to E. P. Rahe (Westinghouse), "Acceptance for Referencing of Licensing Topical Report WCAP 9561, Addendum 3, Revision 1," August 25, 1986.
6. Telephone Call, R. Karsch (NRC) and C. Coffey (PG&E), January 5, 1987.