



COMBUSTION ENGINEERING OWNERS GROUP

**CENPD-279
SUPPLEMENT 8**

**ANNUAL REPORT ON ABB CE ECCS
PERFORMANCE EVALUATION MODELS**

FINAL REPORT

CEOG TASK 975

prepared for the
C-E OWNERS GROUP

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ABB Combustion Engineering Nuclear Operations

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ABSTRACT

This report describes changes and errors in the ABB Combustion Engineering evaluation models for ECCS performance analysis in 1996 per the requirements of 10CFR50.46. For this reporting period, there were no changes or errors in the evaluation models or application of the models.

The sum of the absolute magnitude of the PCT changes for large break LOCA from all reports to date continues to be less than 1°F. No change occurred in the PCT for small break LOCA or post-LOCA long term cooling. Per the criteria of 10CFR50.46, no action beyond this annual report is required.

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1.0 INTRODUCTION

This report addresses the NRC requirement to report changes or errors in ECCS performance evaluation models. The ECCS Acceptance Criteria, Reference 1, spells out reporting requirements and actions required when errors are corrected or changes are made in an evaluation model or in the application of a model for an operating licensee or construction permittee of a nuclear power plant.

The action requirements in 10CFR50.46(a)(3) are:

1. Each applicant for or holder of an operating license or construction permit shall estimate the effect of any change to or error in an acceptable evaluation model or in the application of such a model to determine if the change or error is significant. For this purpose, a significant change or error is one which results in a calculated peak fuel cladding temperature (PCT) different by more than 50°F from the temperature calculated for the limiting transient using the last acceptable model, or is a cumulation of changes and errors such that the sum of the absolute magnitudes of the respective temperature changes is greater than 50°F.
2. For each change to or error discovered in an acceptable evaluation model or in the application of such a model that affects the temperature calculation, the applicant or licensee shall report the nature of the change or error and its estimated effect on the limiting ECCS analysis to the Commission at least annually as specified in 10CFR50.4.

3. If the change or error is significant, the applicant or licensee shall provide this report within 30 days and include with the report a proposed schedule for providing a reanalysis or taking other action as may be needed to show compliance with 10CFR50.46 requirements. This schedule may be developed using an integrated scheduling system previously approved for the facility by the NRC. For those facilities not using an NRC approved integrated scheduling system, a schedule will be established by the NRC staff within 60 days of receipt of the proposed schedule.
4. Any change or error correction that results in a calculated ECCS performance that does not conform to the criteria set forth in paragraph (b) of 10CFR50.46 is a reportable event as described in 10CFR50.55(e), 50.72 and 50.73. The affected applicant or licensee shall propose immediate steps to demonstrate compliance or bring plant design or operation into compliance with 10CFR50.46 requirements.

This report documents all the errors corrected in and/or changes to the presently licensed ABB CE ECCS performance evaluation models, made in the year covered by this report, which have not been reviewed by the NRC staff. This document is provided to satisfy the reporting requirements of the second item above. ABB CE reports for earlier years are given in References 2-9.

2.0 ABB CE CODES USED FOR ECCS EVALUATION

ABB CE uses several digital computer codes for ECCS performance analysis that are described in topical reports, are licensed by the NRC, and are covered by the provisions of 10CFR50.46.

Those for large break LOCA calculations are CEFLASH-4A, COMPERC-II, HCROSS, PARCH, STRIKIN-II, and COMZIRC. CEFLASH-4AS is used in conjunction with COMPERC-II, STRIKIN-II, and PARCH for small break LOCA calculations. The codes for post-LOCA long term cooling analysis are BORNEO, CEPAC, NATFLOW, and CELDA.

3.0 EVALUATION MODEL CHANGES AND ERROR CORRECTIONS

This section discusses all error corrections and model changes to the ABB CE ECCS performance evaluation models which may affect the calculated PCT.

There were no changes to the ECCS evaluation models or changes to their application for calendar year 1996.

4.0 CONCLUSIONS

There were no changes or errors in the evaluation models or their application for large break LOCA, small break LOCA, or post-LOCA analysis during 1996; consequently, there was no change in the PCT. The sum of the absolute magnitude of the changes in PCT calculated using the CE ECCS evaluation models, including those from previous annual reports, References 2-9, remains less than 1°F.

Based on the results reported here, there was no significant change in the sense of 10CFR50.46 in calendar year 1996 and no action beyond the submission of this report is needed.

5.0 REFERENCES

1. "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," Code of Federal Regulations, Title 10, Part 50, Section 50.46.
2. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, April, 1989.
3. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, Supplement 1, February, 1990.
4. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, Supplement 2, April, 1991.
5. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, Supplement 3, April, 1992.
6. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, Supplement 4, April, 1993.
7. "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," CENPD-279, Supplement 5, February, 1994.
8. "Annual Report on ABB C-E ECCS Performance Evaluation Models," CENPD-279, Supplement 6, February, 1995.
9. "Annual Report on ABB C-E ECCS Performance Evaluation Models," CENPD-279, Supplement 7, February, 1996.