



COMBUSTION ENGINEERING OWNERS GROUP

CENPD-279
SUPPLEMENT 3

ANNUAL REPORT
ON
C-E ECCS CODES AND METHODS
FOR 10CFR50.46

CEOG TASK 725

PREPARED FOR THE
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ABB COMBUSTION ENGINEERING
NUCLEAR POWER
COMBUSTION ENGINEERING, INC.

CENPD - 279
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ON
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FOR 10CFR50.46

COMBUSTION ENGINEERING NUCLEAR FUEL
FUEL ENGINEERING

Abstract

This report describes changes and errors in the ABB Combustion Engineering codes and analysis methodology for ECCS analysis in 1991 per the requirements of 10CFR50.46. For this reporting period, none of the computer codes had reportable changes or errors; therefore, the peak cladding temperature did not change. The sum of the absolute magnitudes of the temperature changes for large break LOCA continues to be less than 1 °F. No changes or errors that affect the peak cladding temperature for small break LOCA have occurred. 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 licensed codes for ECCS analysis. The revision to the ECCS Acceptance Criteria⁽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 § 50.46(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 § 50.4.
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 § 50.46 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 § 50.46 is a reportable event as described in §§ 50.55(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 § 50.46 requirements.

This report documents all the changes, made in the year covered by this report, to the presently licensed ABB C-E LOCA analysis models and methodology which have not been reviewed by the NRC staff. This document is provided to satisfy the reporting requirements of the second item above.

2.0 Codes for ECCS Evaluation

ABB C-E uses several digital computer codes for ECCS 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, 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 BORON, CEPAC, NATFLOW, and CELDA.

3.0 Error Corrections and Model Changes in Computer Codes

This section discusses all error corrections or model changes to the licensed codes which may affect the calculated PCT. No changes to codes or analysis procedures have been made in 1991.

4.0 Conclusions

The sum of the absolute magnitudes of the changes in PCT for large break LOCA including those from previous annual reports, References 2-4, is less than 1 °F. There have been no changes in the small break LOCA results to date. Therefore, there was no significant change in the sense of 10CFR50.46 in 1991 and no action beyond the submission of this report is needed.

5.0 References

1. "Emergency Core Cooling System; Revisions to Acceptance Criteria," 10CFR50, Federal Register, Vol. 53, No. 180, September 16, 1988.
2. CENPD-279, "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," April, 1989.
3. CENPD-279, Supplement 1, "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," February, 1990.
4. CENPD-279, Supplement 2, "Annual Report on C-E ECCS Codes and Methods for 10CFR50.46," April, 1991.