

COMBUSTION ENGINEERING

July 3, 1985
ID-85-032

Mr. Cecil O. Thomas, Chief
Standardization and Special Projects Branch
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Revision to C-E Evaluation Model for Large Break LOCA Analysis

- Enclosures:
- 1) "CEFLASH-4A, A FORTRAN77 Digital Computer Program for Reactor Blowdown Analysis", CENPD-133, Supplement 5, June 1985.
 - 2) "COMPERC-II, A Program for Emergency Refill-Reflood of the Core", CENPD-134, Supplement 2, June 1985.
 - 3) "Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and W Designed NSSS", CENPD-132, Supplement 3-P (Proprietary), June 1985.
 - 4) Affidavit Attesting to the Proprietary Nature of CENPD-132, Supplement 3-P.
- References:
- 1) Letter, A. E. Scherer (C-E) to K. Kniel (NRC), ID-77-080, July 20, 1977.
 - 2) Letter, A. E. Scherer (C-E) to J. Miller (NRC), ID-81-095, December 15, 1981.
 - 3) Letter, A. E. Scherer (C-E) to G. W. Knighton (NRC), ID-85-031, July 2, 1985.

Dear Mr. Thomas:

The purpose of this letter is to submit to the NRC a revision to the Combustion Engineering (C-E) Evaluation Model for demonstrating compliance to 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems of Light Water Nuclear Power Reactors", for large break loss of coolant accidents (LOCAs). To this end, twenty three (23)

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Handwritten notes:
CENPD-134
Suppl 2
CENPD-133
Suppl 5
1010
1/23 Each
CENPD-132
Prop Suppl 3
1007
1/23
Two Rids
Needed

copies for each of three (3) topical reports which address various aspects of the Evaluation Model change are transmitted herewith. In general, the modifications are aimed at providing improved calculational efficiency and modeling flexibility. Also provided is a discussion of the application of the C-E Evaluation Model to Westinghouse (W) as well as C-E NSSS designs.

Enclosure 1 provides Supplement 5 to CENPD-133, "CEFLASH-4A, A FORTRAN77 Digital Computer Program for Reactor Blowdown Analysis". This Supplement describes two (2) modifications to the code which are; 1) an improvement to the mathematical integration technique and automatic timestep procedure which has the purpose of improving operational speed and solution stability, and 2) an improvement to the break flow model to allow a more physically founded determination of fluid conditions at the break location. Supplement 5 builds on minor model changes to the CEFASH-4A code documented in Reference 1.

Enclosure 2 provides Supplement 2 to CENPD-134, "COMPERC-II, A Program for the Emergency Refill-Reflood of the Core." This Supplement describes one code modification which is an option to allow for a more realistic specification of the time at which pumped safety injection flow can be credited during the refill/reflood period.

Enclosure 3 provides Supplement 3-P to CENPD-132, "Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and W Designed NSSS." The revision to this topical report describes the manner in which the code modifications described in Enclosures 1 and 2 will be implemented in the C-E Evaluation Model, the results of sensitivity studies conducted for the model changes, and a description of how the Evaluation Model will be applied to the analysis of W NSSS designs. Sensitivity studies are also provided for the application to a W NSSS. The methodology described in Supplement 3-P to CENPD-132 also takes credit for improvements to the C-E ECCS Evaluation Model Flow Blockage Analysis technique which was originally requested by the NRC and which is documented in Reference 2. It is our understanding that review of this material is essentially complete and issuance of an SER can be expected shortly.

Enclosure 3 contains information considered by C-E to be proprietary in nature. As such, we request that it be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790 and that this material be safeguarded. The reasons for the classification of this material as proprietary are delineated in the affidavit provided in Enclosure 4.

None of the improvements described in the material being provided represent a significant departure from models previously approved for use by the NRC. Rather, the modifications represent an extension of already existing models in a manner which provides more modeling flexibility and operational efficiency and, therefore, should not require extensive evaluation during the NRC review and approval process.

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C-E requests your review and approval of the improvements to the C-E Evaluation Model described in Enclosures 1 through 3 as well as the materials provided in References 1 and 2 which have formed part of the base for the subject modifications. This material will be used in evaluating ECCS performance compliance with 10 CFR 50.46 for large break LOCA analyses of C-E NSSS designs as well as W NSSS designs.

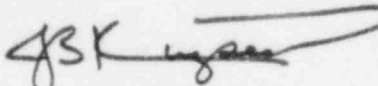
As reported in Reference 3, C-E is investigating a potential non-conservatism in the axial power distribution and peaking factors used in the analysis of C-E supplied NSSSs. Should an update of the Evaluation Model be necessary, it would be in addition to material provided herewith and, therefore, should not affect NRC review of the enclosed material. If updating is required, C-E will discuss with the NRC Staff the most effective means of incorporating any additional material in the review process.

C-E currently has reload fuel contracts with a number of utilities having a C-E supplied NSSS for which application of the improved methodology described above could be beneficial. In addition, C-E is working with several utilities having a W supplied NSSS for which use of this methodology could also be beneficial. As such, a timely NRC review and approval of the material described herein would allow generic referencing and would, thereby, preclude the need for numerous separate submittals and reviews. In order to facilitate the Staff review, C-E would like to arrange a meeting at your convenience wherein the subject changes could be briefly outlined and discussed.

If you have any questions regarding this matter, please do not hesitate to call me or Mr. C. M. Molnar of my staff at (203) 285-5205.

Very truly yours,

COMBUSTION ENGINEERING, INC.

 for AES

A. E. Scherer
Director
Nuclear Licensing

AES:DS
ID-85-032

xc w/o encl.:

E. J. Butcher, Jr. (NRC)
G. W. Knighton (NRC)
B. W. Sheron (NRC)
G. G. Zech (NRC)

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

Combustion Engineering, Inc.)
State of Connecticut)
County of Hartford) SS.:

I, A. E. Scherer, depose and say that I am the Director, Nuclear Licensing, of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations for withholding this information.

The information for which proprietary treatment is sought is contained in the following document:

CENPD-132, Supplement 3-P, Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and W Designed NSSS, June, 1985.

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure are improvements to the methodology for the analysis of large break LOCA ECCS performance and the application of the methodology to non C-E NSSSs, which is owned and has been held in confidence by Combustion Engineering.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F.M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject document herein are proprietary.

4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.

5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

a. A similar product is manufactured and sold by major pressurized water reactor competitors of Combustion Engineering.

b. Development of this information by C-E required thousands of manhours and hundreds of thousands of dollars. To the best of my knowledge and belief a competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience related to the development of improvements to the analysis methodology for large break ECCS performance and its application to non C-E NSSSs.

d. The information required significant effort and expense to obtain the licensing approvals necessary for application of the information. Avoidance of this expense would decrease a competitor's cost in applying the information and marketing the product to which the information is applicable.


e. The information consists of improvements to the C-E methodology for the analysis of large break LOCA ECCS performance and its application to non C-E NSSSs, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

f. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information

without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

g. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

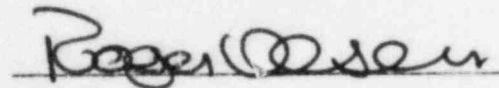
Further the deponent sayeth not.



A. E. Scherer
Director
Nuclear Licensing

Sworn to before me

this 3 day of July 1985



~~Notary Public~~

ROGER L. OLSEN
JUSTICE OF THE PEACE
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TERM EXPIRES: 1/2/89