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VICE PRESIDENT  
SUPPLY

May 20, 1982

Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

ATTENTION: Mr. R. A. Clark, Chief  
Operating Reactors Branch #3  
Division of Licensing

SUBJECT: Calvert Cliffs Nuclear Power Plant  
Unit No. 1, Docket No. 50-317  
Response to Verbal NRC Questions on FATES3  
and ECCS Related to Application for Unit 1,  
Cycle 6 Reload License Amendment

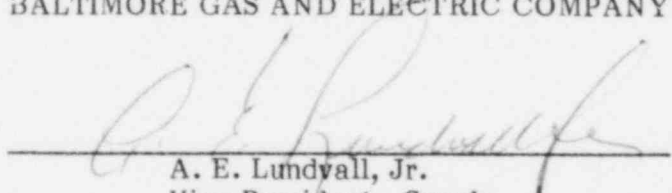
Gentlemen:

The NRC staff posed an additional question on the application of FATES3 to the Unit 1, Cycle 6 application. The staff also requested a status of supplemental ECCS calculations using NUREG-0630 models. Responses to those questions are attached hereto.

Should you have any further questions, please contact us.

Very truly yours,

BALTIMORE GAS AND ELECTRIC COMPANY

  
A. E. Lundvall, Jr.  
Vice President - Supply

AEL/WJL/djw

Attachment

Copies To: J. A. Biddison, Esquire (w/o Attach)  
G. F. Trowbridge, Esquire (w/o Attach)  
D. H. Jaffe - NRC  
P. W. Kruse - CE

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## ATTACHMENT

### QUESTION

Provide a supplemental calculation of ECCS performance using an initial value of volumetric-averaged fuel temperature corresponding to a staff derived value of 2427°F based on the GAPCON-THERMAL-2 code.

### RESPONSE

The ECCS performance code, STRIKIN-II, was used to perform this supplemental calculation. To induce the volumetric-averaged initial fuel temperature, the input gap conductance was conservatively reduced until a slightly higher initial temperature than GAPCON-THERMAL-2 was developed. The ECCS transient was run at a peak linear heat rate of 15.5 kw/ft and the calculated peak clad temperature, peak local clad oxidation and core-wide clad oxidation values were verified to be lower than the 10 CFR 50.46 acceptance limits of 2200°F, 17% and 1%, respectively.

### QUESTION

Please identify the status of supplemental ECCS calculations per NUREG-0630 models.

### RESPONSE

The Calvert Cliffs Unit 1, Cycle 6 ECCS performance analysis (Reference 1) used the clad swelling and rupture models which are part of the NRC approved CE evaluation model (Reference 2). CE previously performed supplemental calculations to demonstrate acceptable ECCS performance for Calvert Cliffs Unit 1, Cycle 4 using the clad swelling and flow blockage models of NUREG-0630 in conjunction with an alternate steam cooling model (Reference 3). In addition, the conclusions of that supplemental calculation were confirmed to be applicable to Cycle 5 (Reference 4).

Although an additional supplemental calculation was not performed for Cycle 6, the conclusions of previous calculations (References 3, 6, and 7) are expected to apply for Cycle 6. That is, if Cycle 6 were analyzed using the NUREG-0630 models and the steam cooling models described in Reference 5, acceptable ECCS performance would be demonstrated. The ECCS performance characteristics for the limiting case in Cycle 6 are very similar to those in Cycle 5. Major parameters such as reflood rates and peak rod power are the same. Other significant parameters such as initial hot rod stored energy and pin pressure are slightly different, however, the resultant predictions for clad rupture time are approximately the same in both Cycles (33 vs. 32 seconds, respectively, for Cycle 5 and Cycle 6). These similarities in performance support the expectation that acceptable ECCS performance results will result.

## REFERENCES

1. A. E. Lundvall to R. A. Clark letter, dated 2/17/82, "Sixth Cycle License Application."
2. CENPD-132, "Calculative Methods for the CE Large Break LOCA Evaluation Model," August 1974 (Proprietary).  
  
CENPD-132, Supplement 1, "Calculational Methods for the CE Large Break LOCA Evaluation Model," February 1975 (Proprietary).  
  
CENPD-132, Supplement 2, "Calculational Methods for the CE Large Break LOCA Evaluation Model," July 1975 (Proprietary).
3. A. E. Lundvall to R. A. Clark letter, dated 1/31/80, "ECCS Flow Blockage Model."
4. A. E. Lundvall to R. A. Clark letter, dated 11/19/80, "Fifth Cycle License Application Responses to NRC Staff Questions."
5. Letter LD-81-095, from A. E. Scherer (CE) to J. R. Miller (NRC), December 15, 1981.
6. Response to NRC Question 231.34 San Onofre Nuclear Generating Stations 2 & 3 Final Safety Analysis Report, Docket No. 50-361.2.
7. Response to NRC Question 490.1, St. Lucie Unit 2 Final Safety Analysis Report.