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Ms. June Allen, President
North Anna Environmental Coalition
212 Owens Drive
Huntsville, Alabama 35801

Dear Ms. Allen:

In your letter dated August 13, 1979, you presented a chronology related to resolution of the metal-water reaction error in the Westinghouse ECCS model. Based on that chronology you note that the problem was resolved for North Anna rapidly (in 4 days), but still appears to be unresolved for Westinghouse plants generically after a year and a half. With this information you question whether the quick solution for North Anna could possibly be valid.

A somewhat expanded chronology should help to clear up these problems:

- March 23, 1978 - Westinghouse informed the staff that they had discovered an error in the LOCTA computer program used at North Anna and other Westinghouse plants to calculate peak cladding temperature (PCT) in their ECCS evaluation model.
- March 29, 1978 - Westinghouse made a detailed presentation on the subject in Bethesda to the staff and the utilities with operating Westinghouse plants. The error resulted in a calculation of the metal-water reaction heat release at one-half of what it should be. (The error also existed in SATAN, a computer program which is part of the same ECCS analysis.) The error and its mathematical confirmation were explained. Westinghouse performed calculations with the error corrected, which showed that some plants would not meet the 2200°F limit of 10 CFR 50.46. Correction of the error always results in an increase in PCT because of higher heat release calculations. The magnitude of the increase depends on the cladding rupture dynamics. Generally the increase is in the range of 75°F to 200°F.

In order to avoid reductions in overall peaking factor (F_o) and possible reductions in power level, Westinghouse recommended other compensatory changes in their evaluation model. It was very apparent to the staff that confirmation and correction of the error were quite straight-forward. If the error

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- May 5, 1978 - VEPCO submitted another analysis for North Anna (ref. 2). The new analysis differed from the March 30 submittal only in allowing a slightly higher overall peaking factor. This still met NRC requirements by taking credit for the margin between the calculated PCT and the 2200°F requirement of 10 CFR 50.46.
- May 19, 1978 - The staff in Amendment 5 to the facility operating license approved the new analysis submitted in reference 2 for North Anna.
- June 20, 1978 - The Office of Nuclear Reactor Regulation (NRR) recommended notifying the appropriate hearing boards regarding the Westinghouse ECCS error. The recommendation specifically excluded North Anna since a solution was already reached for that plant. (ref. 3)
- August 29, 1978 - The NRC informed Westinghouse (ref. 4) that it had completed its review of all the ECCS model changes. The SER which accompanied reference 4 defined the acceptability of the various sub-models. The staff did not grant all the compensating changes requested by Westinghouse. However, no substantive change was made in the original error correction described on March 29, 1978. Since that time, each licensee (except North Anna) has performed analyses using the new model. No mandatory schedule for submitting re-analyses was imposed since the operating plants were under the safety orders issued April 7-10, 1978.
- March 30, 1979 - The NRC staff notified the applicable hearing boards as well as the North Anna appeal board of the error.
- April 13, 1979 - The NRC staff notified the North Anna appeal board by letter that the specific resolution to the error for the North Anna analysis was contained in Section 6.3.8 of Supplement 9 to the facility SER (see March 31, 1978). Therefore the board need not consider any additional solutions since it had been previously resolved.
- May 3, 1979 - The NRC told the North Anna Environmental Coalition that the problem had not been resolved finally for all Westinghouse plants.

The reason for the delay on other plants was not because of any difficulty in correcting the error. That solution was obvious at the presentation on March 29, 1978. If other applicants and licensees had opted for the North Anna type solution, a similar rapid resolution could have occurred. The delay for other plants was due to the review required for additional compensating modifications, and because of delays in receiving recalculations from the licensees.

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correction was the only issue, a long review would not be required. However, the staff informed Westinghouse that a thorough review of the compensating changes would require several months. Compensatory changes considered include changes in the LOCTA and SATAN computer codes which would offset the increase in PCT calculation.

NRC regulations allow the staff to consider any justifiable change to an ECCS evaluation model presented by the vendor or licensee. The NRC has reviewed changes for each reactor vendor ECCS model in the past. The staff also stated that until a new model was approved and corrected calculations were submitted, interim peaking factors would be imposed on each plant.

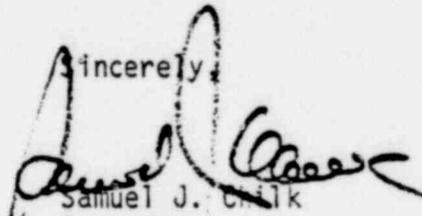
- March 30, 1978 - VEPCO submitted a reanalysis with the error corrected and notified the North Anna Appeal Board. VEPCO did not wish to wait for the possible benefits of the compensating changes for North Anna. Therefore, they submitted a calculation with only the error correction and no claim of compensating benefits. In fact, North Anna was the only plant which chose this option.
- March 31, 1978 - The NRC approved VEPCO's 3/30/78 reanalysis in section 6.3.8 of Supplement No. 9 to the North Anna SER (reference 1). The rapid resolution by the staff was because no compensating changes were requested by VEPCO for the North Anna analysis.
- April 1, 1978 - The NRC issued an amendment to the North Anna license for full power operation.
- April 7-10, 1978 - NRC issued orders specifying interim peaking factors for all operating Westinghouse PWR's except for North Anna. The operating utilities were informed that the interim operating restrictions would be in effect until corrected calculations were received and approved by the NRC. The interim peaking factors were based on a substantial penalty for the uncorrected error, an accounting for any existing margin, and a small credit for one of the compensating changes.

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You also asked if the 1978 "solution" is rendered invalid by new cladding knowledge from TMI. The answer is no. The kinetics of the metal-water reaction have been studied and known for a long time. The requirements for ECCS analysis in 10 CFR 50 Appendix K described a very conservative procedure of calculating the extent of metal-water reaction. The problem with TMI was not with the understanding of metal-water reaction kinetics and conditions, but that substantial portions of the reactor core were uncovered for extended periods of time. Given this uncovered core condition, behavior of the fuel and cladding was as would be predicted from present information.

You also requested the Commission to review the August 6 ASLB decision in the North Anna spent fuel pool expansion proceeding granting VEPCO's motion for summary disposition. Subsequently the NRC staff issued an amendment to permit an increase in the fuel storage capacity at North Anna 1 and 2. Intervenor's have filed a statement of exceptions to the decision and the Licensing Board decision is currently under review by the Appeal Board. After the Appeal Board rules on the Licensing Board decision, the Commission will have the opportunity to review that decision. A copy of your letter and this response will be placed in the NRC public document room and served by the Secretary on the parties to the adjudicatory proceeding.

All of the references mentioned in this reply are available in the PDR except Ref. 3, which is enclosed. I hope that this information is responsive to your concerns.

Sincerely,

Samuel J. Calk
Secretary

Enclosures:
As stated

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References

1. North Anna SER, Supplement No. 9, March 31, 1978.
2. C.M. Stallings (TEPCO), Letter to E.G. Case (NRC), dated May 5, 1978.
3. D.B. Vassallo, AD for LWR's, DPM, Letter to M. J. Grossman Hearing Division Director, ELD, dated June 20, 1978.
4. John F. Stolz, Chief, LWR Branch 1 (NRC), Letter to T.M. Anderson (Westinghouse), dated August 29, 1978.

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