ABB
ASEA BROWN BOVERI

September 29, 1992
LD-92-105

Docket No. 52-002

Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Transmittal of Nuplex 80+ Defense-in-Depth Analysis

Dear Sirs:

This letter transmits ABB-CE Report ALWR-IC-DCTR-31, Evaluation of Defense-in-Depth and Diversity in the ABB-CE Nuplex 80+ Advanced Control Complex. The evaluation is in response to an NRC staff request, originally made in a March 2, 1992 meeting with ABB-CE, for an analysis to demonstrate that the Nuplex 80+ approach to address the potential for common mode software failures is acceptable. The basis of the request was the staff's concern regarding the uncertainties in demonstrating that potential common mode software errors do not exist. Since that time, the requirement for such analyses has been included as one of several draft NRC staff positions regarding defense against common mode failures.

The report demonstrates an extensive degree of diversity and defense-in-depth in the Nuplex 80+ and System 80+ designs to minimize the potential impact of a postulated protection system common mode software error on achieving critical plant safety functions in response to plant event initiators. The report concludes that "Moderate Frequency" category events are no more severe when a protection system software common-mode failure (CMF) is postulated than has been previously determined in the CESSAR-DC Chapter 15 analyses. The assessment is based upon nominal operating margins, normal automatic controls, the Alternate Protection System, and operator action.

The report also identifies some events in the lower frequency "Limiting Fault" category, where alternate means, not currently incorporated in the System 80+ design, would be beneficial in assuring critical functions are achieved independent of systems subject to the postulated CMF. Further quantitative analyses may be required to verify the adequacy of these alternate features. The report observes that the extremely low probability of a Loss of Coolant Accident (LOCA) combined with a CMF should be a factor in determining if this sequence should become a basis for alternate features to mitigate a LOCA concurrent with a CMF.

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At this time, ABB-CE proposes to await the formal issuance of the NRC policy statement and the staff review of the enclosed report before further consideration of design changes. At the earliest opportunity during the report's review, we suggest a meeting between NRC reviewers and ABB-CE to address review questions.

Yours very truly,

COMBUSTION ENGINEERING, INC.

C. B. Brinkman
Acting Director
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Enclosure

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