



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE

SAFETY EVALUATION
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
DOCKET NOS. 50-338/339
MASONRY WALL DESIGN

The findings reported in this Safety Evaluation Report (SER) are based on the attached Technical Evaluation Report (TER), Attachment 1, prepared by Franklin Research Center (FRC) as a contractor to NRC. This TER contains the details of construction techniques used, technical information reviewed, acceptance criteria, and technical findings with respect to masonry wall construction at North Anna units. The staff has reviewed this TER and concurs with its technical findings. The following is our summary of the major technical findings:

1. The licensee has used working stress criteria to qualify 55 safety related masonry walls in the North Anna units. An additional 15 walls around the fuel pool, which did not comply with the licensee's working stress criteria, have now been replaced with "blow-off" siding. The adequacy of this repair has been discussed in the earlier staff Safety Evaluation Report on the spent fuel pool expansion issue at the North Anna units and was found acceptable.
2. As discussed in Section 3.1 of the TER, the licensee's working stress criteria, as used in the re-evaluation of the masonry walls at the North Anna units, either comply with or meet the intent of the staff acceptance criteria. However, the staff questions the licensee's assumptions regarding boundary conditions used in the analysis of some of the cantilevered walls. This issue is further discussed in Item 3 below.

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3. The licensee has made the assumption that the mortar bed joint at the base of the cantilevered wall can be used as fixed end condition. Such a reliance on the mortar bed joint to transfer moment and prevent rotation is questionable. Positive means in the form of clamping devices must be provided for load transfer in this situation. Therefore, to achieve staff acceptance, the cantilevered walls now relying on the mortar bed joint for the fixed end condition must be in conformance with the following staff position:

The cantilevered walls should be upgraded to provide positive means to prevent rotation at the fixed end conditions. These modifications should be consistent with the staff acceptance criteria outlined in Appendix A of the TER. Alternatively, the walls should be modified and analyzed such that the reliance on the mortar bed joint as fixed boundary condition is not required. Again, the modifications should render walls in compliance with the staff acceptance criteria.

Based on the above findings, the staff concludes that, with the exception of the walls requiring implementation of the staff position as discussed in Item 3 of this SER, the Items 2(b) and 3 of the IE Bulletin 80-11 have been fully implemented at North Anna and that there is a reasonable assurance

that the safety-related masonry walls at North Anna units will withstand the specified design load conditions without impairment of (a) wall integrity or (b) the performance of the required safety functions.

Dated: August 12, 1988

Principal Contributor:

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