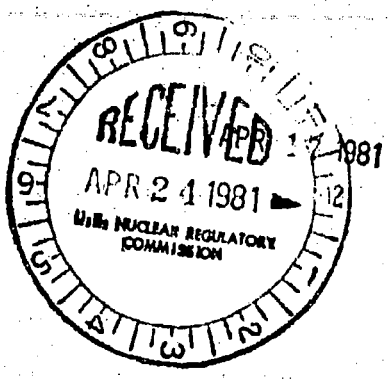

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-547

MEMORANDUM FOR: G. Fiorelli, Chief, Project Branch No. 2, Division of Resident and Project Inspection, Region III

FROM: James H. Sniezek, Director, Division of Resident and Regional Reactor Inspection, IE

SUBJECT: EVALUATION OF MARBLE HILL CADWELDS

In the memorandum to me from D. Hayes dated November 17, 1980 our office was requested to review, evaluate, and provide recommendations on the acceptability of the cadwelds at Marble Hill. The memorandum from D. Hayes to H. Wong, of my staff, dated December 4, 1980 provided additional information on the cadwelds.

Our evaluation has been completed and was provided in our memorandum to you dated April 8, 1981. In summary, we conclude that the buried cadwelds at Marble Hill can be accepted without a significant effect on structural adequacy and that the accessible cadwelds with non-gage mark deficiencies be removed and replaced or repaired in accordance with PSI's proposed program in the January 23, 1981 letter from PSI to J. Keppler.

We have provided in Enclosure 1 specific answers to the questions raised by Region III in the November 17, 1980 and December 4, 1980 memorandums. Should you have additional questions, please contact this office.

James H. Sniezek, Director
Division of Resident and
Regional Reactor Inspection, IE

Enclosure: As stated

cc: E. Jordan, IE
E. Blackwood, IE
J. Keppler, RIII
C. Williams, RIII
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DATE	4/14/81	4/15/81	4/15/81	4/16/81			

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RESPONSE TO REGION III QUESTIONS CONCERNING CADWELDS AT MARBLE HILL UNITS 1 AND 2

I. Memorandum D. Hayes, Region III to J. Sniezek, IE dated November 17, 1980.

A. Is the statistical approach valid to show that defective cadwelds will meet tensile strength requirements given the number and types of defects identified? Was the sample selected from the proper cadweld population? Was the sample size adequate?

The sample of 59 cadwelds from the population of accessible cadwelds was proper to show the character of the accessible population and, by extrapolation, of the entire cadweld population. The sample size of 59 was chosen based upon a statistical method used in a similar manner as for concrete at Marble Hill. The sampling method is now not pertinent as the condition of all accessible cadwelds is known through the reinspection program and the adequacy of structures has been demonstrated through the results of the sampling program, the additional testing of worst case cadwelds, the acceptable results of production and sister splice testing, previous reinspection of Unit 1 cadwelds, consideration of the typical staggering of splices, results of previous testing at the University of Illinois, and the evaluation of stress, cracking, and deflection due to potentially defective cadwelds.

B. Is it acceptable relative to structural design considerations including extrapolating the results to the reported 7500 buried or inaccessible splices and those accessible, not meeting specified requirements but not replaced?

From discussions with PSI and the Region III staff, the inaccessible cadwelds should be no worse than the accessible cadwelds and would most likely be of a higher quality. Therefore, it is reasonable and acceptable to extrapolate the results from accessible cadwelds to those that are buried.

C. Do tensile tests alone adequately demonstrate that the behavior of visually rejectable cadwelds are compatible with the design basis for reinforced concrete? Should strain be considered in view of the visual defects identified?

As indicated in A above, tensile tests do not alone demonstrate structural adequacy. The additional analyses, testing, and evaluations by PSI combined with the tensile testing lead to the conclusion of structural adequacy.

II. Memorandum D. Hayes, Region III to H. Wong, IE

A. What should the NRC policy be concerning the 20-25% of the accessible cadweld splices that do not meet specified requirements endorsed by Regulatory Guide 1.10?

The testing of the accessible cadwelds was not to demonstrate acceptability of rejectable cadwelds, but to demonstrate the adequacy of structures with potentially defective embedded cadwelds. It should remain the policy of the NRC to require that nonconforming cadwelds be rejected.

B. Given the logical conclusion that the same proportion of the buried or inaccessible cadweld splices will not meet specified requirements as the accessible splices, what testing, evaluation, etc., needs to be performed on the accessible splices to provide assurance that the approximately 7400 inaccessible splices will perform to design requirements?

The analyses, testing, and evaluations performed by PSI and summarized in I.A. above demonstrates structural adequacy.