

Vepco

USNRC REC
ATLANTA

VIRGINIA ELECTRIC AND POWER COMPANY, RICHMOND, VIRGINIA 23261

9 JUL 9 A10:18

July 6, 1979

Mr. James P. O'Reilly, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Serial No. 402B
PSE&C/RHW,III:bam

Docket No. 50-339

Dear Mr. O'Reilly:

Our letter of May 24, 1979, Serial No. 402, in response to IE Bulletin 79-02 was our report on pipe support base plate designs using concrete expansion anchor bolts. This letter provides the additional information requested by IE Bulletin 79-02 Revision No. 1 dated June 21, 1979.

Item 1 of the revised bulletin requires that justification be submitted when the criteria for determining flexibility is different from that stated in the bulletin: "...the base plates should be considered flexible if the unstiffened distance between the member welded to the plate and the edge of the base plate is greater than twice the thickness of the plate." The revised bulletin also requires that "...a description of the analytical model used to verify that pipe support base plate flexibility is accounted for in the calculation of anchor bolt loads..." be submitted with our response to the bulletin.

The criteria used to determine base plate flexibility in the design of the pipe supports for North Anna Unit 2 was developed as the result of comparing finite element computer results with manual calculation methods which assumed base plate rigidity. A public domain computer program titled "ANSYS" as developed by Swanson Analysis System, Inc. of Houston, PA was used to model typical base plates in establishing this criteria. Base plates were modeled as finite element beams on elastic foundations using various plate sizes, thicknesses, loads, and anchor bolt patterns. The results of this finite element analysis were compared with the results of manual calculations which analyzed the base plates as being rigid. As a result of these comparisons, it was found that where the ratio of the unstiffened distance between the member welded to the plate and the outermost anchor bolts, as compared to the base plate thickness, was less than or equal to five to one, then anchor bolt loads could be conservatively calculated by using a rigid base plate analysis. Base plates which met this criteria were analyzed as rigid.

303061

790268

7909040 560

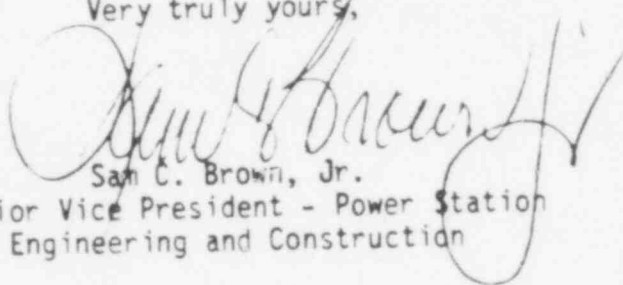
ORIGINAL COPY

Base plates where this ratio was greater than five to one were considered to have some degree of flexibility as a finite element analysis could result in higher anchor bolt loads than would be calculated using a rigid analysis. Base plates falling in this category were re-evaluated and modified as necessary to ensure that maximum anchor bolt loads would not exceed the allowable bolt loads and that base plate stresses would not exceed the allowable design stress.

The response to items 2, 3, and 4 of the revised bulletin as addressed for North Anna Unit 2 is as stated in our previous letter of May 24, 1979.

If you require any further information on this subject, please contact us.

Very truly yours,



Sam C. Brown, Jr.
Senior Vice President - Power Station
Engineering and Construction

cc: Mr. Victor Stello, Director
Office of Inspection & Enforcement

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation

303062