



Northern Indiana Public Service Company

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EUGENE M. SHORB
FIRST VICE PRESIDENT

July 6, 1979

Mr. James G. Keppler
U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Re: NRC IE Bulletin 79-02
Revision 1 Dated 6-21-79

Dear Mr. Keppler:

In response to the IE Bulletin 79-02, Revision 1, Northern Indiana Public Service Company submits the following information:

Response to Item #1

The pipe support baseplate utilizing concrete expansion anchor bolts for Bailly Generating Station - Nuclear 1 will be designed to accommodate baseplate flexibility. These designs will utilize wedge type expansion anchors ranging in diameter from 1/4 inch to 1 inch, with an embedment depth of 8 anchor diameters.

A non-linear finite element analysis of the expansion anchor plate assemblies will be performed utilizing a typical finite element model of a quarter section of a plate assembly. The concrete under the baseplate is represented by one-way (compression only) springs and the stiffness of these springs is computed on the basis of the elastic half-space approach. The anchors are represented by truss elements and the stiffness of the concrete expansion anchors are based upon an idealized load displacement curve. Pre-load in the concrete expansion anchors is simulated by an equivalent negative temperature load.

Due to the non-linear nature of the idealized load displacement curve, the plate assemblies are analyzed by the ultimate design approach in which the design loads are multiplied by a load factor equal to four. The

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resulting expansion anchor reactions are compared with the ultimate capacity of the expansion anchors. The load factor equal to four was selected to be consistent with the minimum required factor of safety used in the rigid plate analysis.

Response to Item #2

Wedge type anchor bolts will be specified and will be designed using a minimum factor of safety of four between bolt design load and the bolt ultimate capacity.

Response to Item #3

The dynamic/cyclic loads for which the pipe support baseplates will be designed will be obtained from a response spectra or time history method of analysis. These loads will be increased by a factor of 1.5 to account for dynamic impact effects.

Presently, Northern Indiana Public Service Company intends on participating with several utilities in a testing program to investigate the static, dynamic and relaxation characteristics of various types of concrete anchors. Participation in this test program is dependent on a satisfactory resolution of the pile driving matters presently before the Commission. This testing program will be a comprehensive dynamic testing program under the direction of an independent testing laboratory to verify the dynamic behavior of wedge type expansion anchors. The results of the dynamic testing program will be available and reported to the NRC upon completion.

Response to Item #4

This question is not directly applicable to Northern Indiana Public Service Company inasmuch as no concrete nor concrete anchors have been installed, however, Northern Indiana Public Service Company expects to comply with the requisites of Item #4 by the exclusive use of wedge-type anchors with embedment depths equal to 8 anchor diameters in all safety-related areas of Bailly Generating Station - Nuclear 1. All concrete expansion anchors will be installed in accordance with approved QA/QC procedures.

These procedures will require, as a minimum, the verification of the

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following items:

- a. Installation torque
- b. Test torque (measure of expansion anchor preload relaxation)
- c. Embedment depth
- d. Anchor size

The testing program referenced in question 3 may require that additional Quality Control items be added to the above list.

Response to Item #5

Not applicable to Bailly Generating Station - Nuclear 1 as this item addresses those facilities with Operating Licenses.

Response to Item #6

Northern Indiana Public Service Company will maintain at the Bailly site all related Quality Assurance and Quality Control documentation required for the proper placement of the concrete expansion anchors on site and this documentation will be available for NRC inspection.

If any questions are forthcoming, contact Mr. R. J. Bohn, (219) 787-8531, Ext. 205.

Very truly yours,



EMS:cgs

cc: U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Construction Inspection
Washington, D. C. 20515

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