

ILLINOIS POWER COMPANY



U-0267  
LO8-81(07-31)-6  
500 SOUTH 27TH STREET, DECATUR, ILLINOIS 62525

July 31, 1981

Mr. James G. Keppler  
Director, Region III  
Office of Inspection & Enforcement  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137



Dear Mr. Keppler:

Clinton Power Station Units 1 and 2  
Docket Nos. 50-461 and 50-462  
Construction Permit Nos. CPPR-137 & CPPR-138

- Ref. 1 - IPC Letter no. U-0098, dated July 5, 1979, to Mr. Keppler of NRC, Region III
- Ref. 2 - IPC Letter no. U-0099, dated July 20, 1979, to Mr. Keppler of NRC, Region III
- Ref. 3 - IPC Letter no. U-0116, dated January 4, 1980, to Mr. Keppler of NRC, Region III

This is the last portion of our response to your letter of November 8, 1979, whereby you forwarded Revision No. 2 to IE Bulletin No. 79-02. Our response to action items 1 through 4 of revision No. 1 was transmitted to you on July 5, 1979, by our letter U-0098, LO8-79(07-05)-9, and it still applies. In that response we committed to perform a static and dynamic testing program for concrete expansion anchors, to verify the assumptions used in the design of expansion anchored base plates for Clinton Power Station (CPS) Unit 1. This letter summarizes the conclusions of the testing program and supplies an update on items 2, 3, 5 and 6 of the Bulletin.

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The testing program included:

1. Single Anchor Load Displacement Tests - to obtain load displacement curves and ultimate capacities for wedge, sleeve, self-drilling and drop-in anchors.
2. Static Load Displacement Tests on Flexible Plate Assemblies - to obtain the prying action behavior of the flexible plate and determine the decrease in prying action with increasing anchor displacement.
3. Dynamic Tests on Plate Assemblies - to obtain the cyclic load displacement behavior of anchors subjected to seismic and pipe transient loadings.
4. Single Anchor Relaxation of Torque or Loss of Preload Test - to obtain the rate of loss of anchor torque with time after installation.

The main conclusions of the test programs are:

1. The displacement of the anchor at the ultimate load is large enough to relieve the prying action in the base plate, which verifies the analytical results shown in Sargent & Lundy's report, "Evaluation of Analysis Procedures for the Design of Expansion Anchored Plates in Concrete", submitted with Ref. 1.
2. Dynamic/cyclic testing has verified the capability of expansion anchors to withstand five OBE events (represented by application of 200 cycles of 25% of manufacturer's ultimate load) followed by one SSE event (represented by application of 40 cycles of 50% of manufacturer's ultimate load).
3. Dynamic/cyclic testing results verified that relaxation of anchor preload is not a significant factor in the design of expansion anchors.

Two copies of the testing program summary report are attached, and complete reports are available in our offices in Decatur and at CPS.

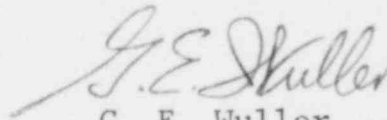
With respect to items 2 & 3 of the Bulletin, results of the testing program have shown that anchored plate assemblies using concrete expansion anchors can withstand an SSE load (preceded by five OBE events involving half the SSE load). At Clinton Power Station we still designed into all our assemblies using wedge type anchors a factor of safety of four, as specified in the Bulletin.



With respect to item 5, we have not used, and do not intend to use expansion anchor bolts to support Seismic Category I (or safety related) piping systems from concrete block (masonry) walls. Our design standards and construction procedures do not provide for such use. Any exceptions will be analyzed to insure acceptability and results documented through our Nonconformance Report program.

With respect to item 6, pipe supports with expansion anchors have not been used with structural steel shapes rather than base plates. Again, our standards and procedures do not provide for these configurations.

Sincerely,



G. E. Wuller  
Supervisor - Licensing  
Nuclear Station Engineering

CCW/lt

Enc.

cc: Director, Division of Reactor Construction Inspection  
Office of Inspection & Enforcement, USNRC (w/1 cpy of summary report)  
H. H. Livermore, NRC resident inspector (w/o attach.)