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Mr J G Keppler, Regional Administrator  
US Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER PROJECT  
DOCKET NOS 50-329 AND 50-330  
IE BULLETIN 79-02  
FILE: 0505.12 SERIAL: 23757

References: CPCo letters to J G Keppler; Midland Project;  
Docket Nos 50-329, 50-330; IE Bulletin 79-02:

- 1) Serial Howe-195-79; dated July 3, 1979
- 2) Serial Howe-233-79; dated August 15, 1979
- 3) Serial Howe-84-80; dated May 7, 1980
- 4) Serial 9107; dated June 9, 1980
- 5) Serial 10049; dated October 31, 1980
- 6) Serial 11505; dated February 26, 1981
- 7) Serial 14636; dated December 15, 1981
- 8) Serial 17510; dated June 1, 1982
- 9) Serial 20684, dated January 28, 1983

References 1 through 9 are correspondence which address IE Bulletin 79-02.  
References 3 through 9 reported that further evaluations and corrective  
actions were required to completely address 79-02.

Attachment 1 provides another interim report on this subject. Either a final  
response or a status report will be provided by January 31, 1984.

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CC Document Control Desk, NRC  
Washington, DC

RJCook, NRC Resident Inspector  
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OC0783-0040A-MP01

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REPORT FOR I&E BULLETIN 79-02

SUBJECT: I&E BULLETIN 79-02  
"PIPE SUPPORT BASE PLATE DESIGNS USING  
CONCRETE EXPANSION ANCHOR BOLTS"

INTERIM REPORT

DATE: July 26, 1983

1. Anchor Bolt Use Prohibition

- a. An agreement has been reached with the original pipe support design agency to allow a one-time design deviation that permits expansion anchor bolts to remain in the first two supports on either side of a pump, provided the calculated bolt load is 25% or less of the anchor bolt specification allowable. Pipe supports that do not meet these criteria will be reworked.
- b. The primary design agency has prepared a report to document their design methodology. The method has been determined to be acceptable. Bechtel review of the first submittal of this report has been completed, and Bechtel comments have been addressed by the design agency in a revised report. Bechtel review of the revised report will be completed by September 30, 1983.
- c. Discrepant pipe support designs issued by the pipe support design agency and documented on nonconformance reports have been dispositioned. All pipe support designs issued by the primary pipe support design agency are being rereviewed for proper anchor bolt usage. This review is now being conducted to a priority based on the seismic reanalysis schedule rather than the turnover schedule as previously stated. The new schedule for completion of the review is now anticipated to be November, 1983.

2. Determination of Proper Embedment Depth

- a. The inspection of anchor bolts used for pipe supports is addressed in Section 6.
- b. It has been concluded that no further testing and inspection for embedment depth is required for expansion anchors used on non-pipe support applications. This conclusion is based

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on the results of the reinspections of expansion anchors used on pipe supports, and heating, ventilating, and air conditioning Seismic Category I support applications.

Reinspection and testing in accordance with project specifications (issued to satisfy the requirements of I&E Bulletin 79-02) for pipe support anchors installed before May 30, 1980, was completed. Of 1,631 expansion anchors reinspected, 65 did not meet the requirements for embedment depth. These results indicate, with a 95% confidence level, that over 95% of the anchors satisfies the criteria for embedment length. Additional reinspection and testing of expansion anchors used for heating, ventilating, and air conditioning Seismic Category I supports was performed. Of 4,565 expansion anchors reinspected, 72 did not meet the requirements for embedment depth. These results also indicate, with a 95% confidence level, that over 95% of the anchors satisfies the criteria for embedment depth.

- c. The controls initiated in May, 1980 for length marking and quality control inspection (MCAR 31) provide assurance that embedment depth will not pose a problem.

3. Demonstration of Achievement of Required Factor of Safety

- a. Midland-specific tests to determine the amount of preload remaining in the bolt indicate that an average of 37% of the original preload remains in the bolt after 1 year. Other tests (References A and B) have established that the amount of preload on the bolts will not affect the performance of the anchorage. If the initial installation torque on the bolt accomplishes the purpose of setting the wedge, then the ultimate capacity of the bolt is not affected by the amount of preload present in the bolt at the time of cyclic loading. These tests (Reference A and B) indicate no anchor pullout failures occurred as a result of cyclic loading and that preload is not required to withstand cyclic loading. A revised response to I&E Bulletin 79-02 has been completed.
- b. An additional static tension test (Reference C) to supplement the manufacturer's data was completed. The final report, combined with the manufacturer's data, establishes that all sizes of expansion anchors used for pipe supports under the scope of I&E Bulletin 79-02 on the Midland project met the required factor of safety for pullout.

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MCAR Status

a. MCAR 34:

Bechtel Management Corrective Action Report (MCAR) 34 final report, concerning installed drop-in anchors, has been issued. No further new corrective action is required. Required rework has been completed and MCAR 34 was closed on December 14, 1982.

b. MCAR 31:

MCAR 31 revised final report, concerning embedment depth of expansion anchors, was issued May 10, 1982. Corrective actions associated with MCAR 31 are complete and the MCAR was closed on May 24, 1982.

5. Reportability Review

Review of the results of the inspection and tests identified no items with a safety impact. Results of future analyses will be reviewed for reportability under 10 CFR 50.55(e).

6. Additional Expansion Anchor Inspections

Inspection of 100% of the accessible pipe support expansion anchors installed before May 30, 1980, is complete. An evaluation of the adequacy of the inaccessible anchors (less than 6.7% for any parameters), based on the inspection results of the accessible anchors, is now complete. As a result of this review, it has been determined that no rework of the inaccessible anchors will be required. Identification and completion of the rework for the inspected anchors is now approximately 90% complete. The remaining 10% will be reworked as part of the Construction Completion Program (CCP). A detailed schedule for system completion under CCP is currently being developed. Actual implementation is subject to NRC concurrence that work can proceed. It is anticipated that an actual schedule will be available for inclusion in the next report.

REFERENCES

- A. Teledyne Engineering Services Technical Report 3501-2 for Utilities/TES Owners Group Summary Report Generic Response to US NRC I&E Bulletin 79-02.
- B. Commonwealth Edison Company Summary Report, Static, Dynamic and Relaxation Testing of Expansion Anchors in Response to NRC I&E Bulletin 79-02.
- C. Final Report on Concrete Expansion Anchor Static Tension Tests for Bechtel Power Corporation, March, 1982, Wiss, Janney, Elatner and Associates, Inc.