U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report Nos. 50-010/80-05; 50-237/80-05; 50-249/80-05;
- 50-254/80-05; 50-265/80-08

Docket Nos. 50-010; 50-237; 50-249; 50-254; 50-265

License Nos. DPR-02; DPR-19; DPR-25; DPR-29 DPR-30

Licensee: Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60690

Facility Name: Dresden Nuclear Power Station, Units 1, 2, and 3
Quad-Cities Nuclear Power Station, Units 1 and 2

Inspection At: EDS Nuclear Inc., San Francisco, CA

Inspection Conducted: February 27 - 28, 1980

Inspector: I. T. Yin 3/11/80

Approved by: D. H. Danielson, Chief, Engineering Support Section 2 3/13/80

Inspection Summary

Inspection on February 27-28, 1980 (Report No. 50-010/80-05; 50-237/80-05; 50-249/80-05; 50-254/80-05; 50-265/80-08)
Areas Inspected: Licensee actions relative to IE Bulletin No. 79-14 including general discussion on NRC requirements, work procedure review and review of analysis and calculations. The inspection involved 12 inspector-hours on site by one NRC inspector.
Results: No items of noncompliance or deviations were identified.

## DETAILS

### Persons Contacted

Commonwealth Edison Company (CECo)

M. Strait, Engineer, SNED

EDS Nuclear Inc. (EDS)

B. F. Phipps, Manager, QA
R. A. Hobgood, Supervising Engineer, QA
M. J. Scholtens, Project Manager
J. B. McCarthy, Manager, Piping Analysis Division
T. K. Snyder, Section Manager, Piping Analysis Division
R. L. Rotblatt, Supervising Engineer, Engineering Design Division (EDD)
R. T. Chan, Senior Engineer, EDD

### Functional or Program Areas Inspected

This special inspection was conducted at the EDS office to evaluate the licensee's implementation of IEB 79-14, including verification and evaluations performed by their engineering consultant. The unresolved areas identified during the inspection will be reviewed during subsequent inspections.

1. Review of EDS Procedures

   The following EDS Project Instructions issued for the purpose of evaluation of site deficiencies identified during field verification of piping and component configuration and location were reviewed by the inspector. The inspector stated that he had no adverse comments and furthermore, he considered the unresolved matters of Dresden 1, 2, and 3 identified in the RIII Reports No. 50-010/79-18; 50-237/79-21; and 50-249/79-19 Paragraph 2, "IEB 79-14 Procedure Review" closed based on the present review at the EDS and previous procedure review at the Quad-Cities 1 & 2 recorded in Paragraph 2.a. of RIII Reports No. 50-254/79-28 and 50-265/79-25.

   - Title 1.0, "Engineering Criteria/Procedure for the Review and Resolution of As-Built Deviations", Revision 1, dated October 5, 1979.

   - Title 2.0, "Administrative Procedure for Processing Bechtel Piping Walkdown Packages Through Operability Assessment", Revision 1, dated February 22, 1980.

   - Title 3.0, "CECO Design Log (CDL) File; Organization and Control Procedure", Revision 0, October 10, 1979.

. Title 4.0, "Review of As-Built Package for Potential Nonconformance Revision 0, dated October 19, 1979.

. Title 5.0, "Engineering Criteria/Procedure for the Application of the Blume Curves Criteria", Revision 0, dated October 19, 1979.

. Title 6.0, "Procedure for the Computer Reanalysis of Piping Systems", Revision 0, dated October 22, 1979.

. Title 7.0, "Documentation and Transmittal Procedure", Revision 0, dated October 23, 1979.

. Title 8.0, "Pipe Support Engineering Criteria/Procedure for the Review and Resolution of As-Built Deviations", Revision 0, dated October 23, 1979.

2. Review of Personnel Qualification

Although there appeared to be no specific criteria established for the personnel handling the IEB 79-14 evaluation work, the inspector considered the EDS provision met the intent of the quality assurance based on the following reasons:

a. All personnel involved were EDS employees. No contracting personnel had been hired for the work.

b. Specific training and reading assignments were established. Signed certification for each person qualified had been documented in "Project Initiation Checklist" files.

c. Personnel assigned including Engineer and Engineering Assistants I, II, and III, their position description including "position qualification" requirements were documented in the EDS corporate personnel department files.

3. Seismic Analysis Evaluation Methods

The subject methods utilized by EDS are equivalent to the original licensee FSAR commitments as follows:

Dresden 1

The plant has under gone de-contamination. The licensee plans to implement IEB 79-14 requirements in the initial information gathering stage. However, field inspection and EDS evaluation work should be completed prior to plant startup scheduled for July, 1980.

For Quad-Cities 1 and 2, Sargent and Lundy (S&L) provided additional interpretation and instruction on design considerations such as:

. Seismic deflection limited to 2".

. Since the curves are based on simply supported beam, to account for continuity of the piping across a restraint, the reactions from all piping spans on the same restraint are added.

. Reduced span due to concentrated mass (valves and etc.) in between restraints.

. Piping above El. 579 ft. restraint load will be multiplied by three to account for amplification.

. Since the curves are based on OBE, all deflections, stresses, and reactors as determined from the curves must be doubled to obtain DBE (SSE) valves.

For the IEB 79-14 evaluation work, EDS has adopted S&L instructions and in addition, provided further considerations in the areas of:

. Additional weights due to pipe insulations.

. Weight limitations of piping components, such as valves, in between restraints.

In conclusion, the inspector raised the following questionable areas that will require further address on behalf of the licensee:

a. How pipe vendors can perform the original seismic analysis and restraint design for the Dresden 2 and 3 project based on apparent lack of instructions on how to utilize the Blume Curves.

b. The original piping design was based on ANSI B31.1-69 "Power Piping Code". Whether or not the code established flexibility and stress itensification factors had been taken into consider ation was unknown.

c. The present EDS evaluation is limited to those deficiencies and deviations identified during field verification inspections although the criteria of evaluation had been upgraded from the original design considerations. In conjunction with item a. above, the inspector made request to the licensee that all previously Blume Curves designed Dresden 2 and 3 and Quad-Cities 1 and 2 systems should be evaluated by EDS.

5. Operability Evaluation

One of the NRC criteria for evaluating operability of seismic design piping supports relating to IEB 79-02 and 79-14 is that in case licensee identified problems with piping supports in which the original design margins were not met, the system could continue to operate in a period of time prior to restoration to its original safety margin provided that the overall factor of safety compared to ultimate strength equal to or less than two.

In review of EDS Calculation No. MD32-Q1-STGA for the Standby Gas System 7509-24" line, Revision 0, dated October 19, 1979, the inspector determined that the proper code flexibility factor and stress intensification factor had been applied, and the system configuration coordinations had been checked and verified. In discussion with EDS engineers, the calculation was made because of the defective restraints identified in the system and the restraints had been fixed after the discovery that the new primary stress based on OBE had exceeded 0.5 material ultimate strength. The inspector stated that in comparison with 0.5 of the material ultimate strength, the primary stress based on DBE (SSE), which is double the value of OBE, should be used. Although he had no further questions regarding the specific standby gas system since the restraints had been repaired to its original conditions, he requested that EDS should re-evaluate all previous operability evaluations to ensure compliance with the NRC criteria.

Exit Interview

The inspector met with licensee representatives at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings reported herein.