

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-346/77-02

Licensee: Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, Ohio 43652

Davis-Besse Nuclear Power Station
Oak Harbor, Ohio

License No. CPPR-80
Category: B

Type of Licensee: PWR 2772 MWt 926 MWe

Type of Inspection: Announced, Special

Dates of Inspection: January 19-20, 1977

Principal Inspector: *K. R. Naidu*
K. R. Naidu

2/4/77
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *E. L. Jordan*
E. L. Jordan, Chief
Engineering Support Branch

2/4/77
(Date)

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SUMMARY OF FINDINGS

Inspection Summary

Inspection of January 19 and 20, 1976, (Unit 1, 77-02): Observed the performance of Hi-Pot testing on cables in conduits 27708A and 36919B. No items of noncompliance were identified. Test results, indicate that cables in the conduits were not damaged.

Items of Noncompliance

None.

Licensee Action on Previously Identified Enforcement Items

Not reviewed.

Other Significant Items

A. Systems and Components

None.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Deviations

None.

E. Status of Previously Reported Unresolved Items

None.

Management Interview

- A. The following persons attended the Management Interview at the conclusion of the inspection.

Toledo Edison Company (TECo)

L. E. Roe, Vice President, Facilities Development
E. C. Novak, General Superintendent Power Engineering
and Construction.
J. D. Lenardson, Quality Assurance Manager

- B. Matters discussed and comments on the part of the management personnel were as follows:

The inspector stated that he observed the Hi-Pot tests on cables in selected conduits and determined that the tests were being conducted satisfactorily. The inspector stated that the complete documentation on the test results will be reviewed during a subsequent inspection.

REPORT DETAILS

Persons Contacted

The following persons other than those listed under Management Interview section of the report, were contacted during this inspection:

Bechtel Corporation. (Bechtel)

W. C. Lowery, Electric Quality Assurance Engineer

Fischbach and Moore, Incorporated (F&M)

W. L. Columbia, Assistant Project Engineer

G. L. Roshy, Quality Control Manager

Toledo Edison Company (TECo)

M. D. Calcamuggio, Electric Engineer

C. Daft, Field Quality Assurance Engineer

G. W. Eichenauer, Field Quality Assurance Engineer

W. Mitchell, Electrical Engineer

E. Wilcox, Field Quality Assurance Specialist

Results of Inspection

1. Observation of High Voltage Tests on Cables

To observe the testing in progress and determine whether the performance of the high voltage tests on cables in two predetermined conduits were conducted to established procedure CTP-7749-E14 - 11.9 i.e., dated March 15, 1974, and determine whether the results were acceptable. These tests were conducted to meet the licensee's commitments to assure the NRC that jacket insulation of cables was not damaged during installation of cables into highly filled conduits. (Reference Item 10, Page 7 of IE Inspection Reports No. 050-346/76-11 and No. 050-346/76-25)

2. Inspection Objectives Accomplished By

- a. Review of Construction Test Procedure for DC Hi-Pot Testing Electrical Cable rated greater than 600 volts CTP-7749-E14-11.9 i.e., Revision 1, dated March 15, 1974.
- b. Review of Letter TECO File 0273-E-14 dated December 10, 1976, instructing Bechtel to use the above specification but to use 10KV DC instead of the test voltage specified in Paragraph 6.6.

- c. Review Bechtel letter FL14-4503, dated January 3, 1977, instructing F&M to perform the Hi-Pot test on the cables in conduits 27708A and 36919B.
- d. Observing the testing of three cables in conduit 27708A and four cables in conduit 36919B.

3. Inspection Findings

a. General

Conduit 27708A contained seven cables identified by numbers ICBE1126C, ICBE1147G, ICBE1161F, ICBE1194G, ICBE1195C, ICBE1199G and ICBE1218H, Conduit 36919B contained nine cables identified by numbers 2CAD1083, 2CAD1130, 2CGD201N, 2CGD202B, 2CGD202E, 2CGD202F, 2CGD203G, 2CGD208B and 2CGD210A. Two spare cables, 2C SPARE 19 and 2C SPARE 20 which had at one time been pulled through the conduit had been pulled back and were lying in the cable tray spares, were included in the testing.

b. Methods of Testing

10 KV DC was being applied between an individual conductor and the remaining conductors in a given cable. The test was repeated so that every conductor was tested against the conductors. The charging currents, after stabilization was reached, were being recorded. The voltage was raised in steps of 2KV in two minute intervals, to reach a maximum of 10KV and held for five minutes. In doing so the procedural requirements were being met.

As a result of discussions with the licensee, on January 20, 1977, the test was modified and 10 KV DC was applied between an individual conductor in a cable and other conductors in the same cable along with all the other conductors in cables in the same conduit. Two cables in conduit 27708A and three cables in conduit 36919B were tested in this manner. On January 21, 1977, the test was modified and 10KV DC was applied between an individual conductor and all the other conductors in the same cable, with all the conductors in the cables routed through the conduit, at ground potential.

c. Observation of Tests

The inspector observed the tests being performed and determined that:

- (1) Cables tested were procured to specification E-7749-15.
- (2) The two DC Hi-Pot testers had current calibration stickers and the calibration records were acceptable.
- (3) Relative humidity and temperature were being recorded on the data sheets. The values were supplied by the painting contractor, Bagwell Industries.
- (4) The cables under test were meggered prior to the Hi-Pot test.
- (5) Test voltage was being applied in increment steps of 2KV every two minutes and the charging currents were being recorded in microamperes.
- (6) Test results indicated that leakage currents were acceptable as established in the procedure mentioned below.
- (7) Acceptance criteria was that the leakage currents should first increase and subsequently decrease and stabilize, should not continue to increase at full test voltage and leakage currents on individual conductors of the same cable should not deviate more than 300% from each other.

The performance of the tests and the values measured were determined acceptable. The documentation on the tests will be reviewed during a subsequent inspection.