

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-346/76-18

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

Davis-Besse Unit 1
Oak Harbor, Ohio

License No. CPPR-80
Category: B

Type of Licensee: B&W PWR 871 MWe
Type of Inspection: Special, Announced
Dates of Inspection: September 21-21, 1976

Principal Inspector: *F. J. Jablonski*
F. J. Jablonski

10-18-76
(Date)

Accompanying Inspector: *D. W. Hayes*
K. R. Naidu

10/19/76
(Date)

Other Accompanying Personnel: None

Reviewed By: *D. W. Hayes*
D. W. Hayes, Chief
Projects Section

10/19/76
(Date)

8001300 727

SUMMARY OF FINDINGS

Inspection Summary

Inspection of September 21-23, (76-18): Reviewed licensee's corrective action relative to previously identified noncompliances and other unresolved matters including status of inspection effort relative to the special inspection of safety related electrical wiring, raceways and adverse environment. Two items of noncompliance were identified relative to identification of inspection status and implementation of proper inspection technique. One deviation was identified relative to support of cables.

Enforcement Items

Infractions

Contrary to 10 CFR 50, Appendix B, Criterion X, the licensee failed to verify that modifications or repairs to systems and components were inspected in accordance with design requirements, in that Engineering Inspection Report (EIR) items not adequately reworked were inappropriately accepted. (Paragraph 1.d.(2)(a), Report Details)

Contrary to 10 CFR 50, Appendix B, Criterion XIV, the licensee failed to identify and control the inspection status of structures, systems and components during and after the installation process, in that completed and inspected items were not precluded from inadvertent work activities. (Paragraph 1.d.(2)(b), Report Details)

Licensee Action on Previously Identified Enforcement Items

- A. Borated Water Storage Tank-Failure to Report (IE Inspection Reports No. 050-346/76-02 and No. 050-346/76-13)

This item will remain open until the licensee's final report is reviewed and implementation of proposed repairs is verified by IE.

- B. Inspection of Reworked Items (IE Inspection Report No. 050-346/76-13, Item A1)

See below.

- C. Identification-Corrective Action (IE Inspection Report No. 050-346/76-13, Item A2)

See below.

- D. Sealant Material Density Range (IE Inspection Report No. 050-346/76-13, Item B2)

See below.

- E. Sealant Material Mixing Procedure (IE Inspection Report No. 050-346/76-13, Item B3)

The corrective action for the above items (B through E) as outlined in the Toledo Edison Company (TECO) letter of August 30, 1976, in response to the IE:III letter and report dated July 23, 1976 was determined to have been satisfactorily accomplished and documented. These items are considered to be closed.

- F. Sealant Material Specification Requirements (IE Inspection Report No. 050-346/76-13, Item A3)

This item remains open. (Paragraph 2.a, Report Details)

- G. Qualification, Indoctrination and Training Records (IE Inspection Report No. 050-346/76-13, Item B1)

This item remains open. (Paragraph 2.b, Report Details)

Licensee Action on Previously Identified Deviations

- A. Electrical Fire Barriers (IE Inspection Reports No. 050-346/76-02, No. 050-346/76-13)

All areas requiring fire barriers have not been identified. No fire barriers have been installed. This matter remains open.

- B. Reactor Vessel Particulate Monitor (IE Inspection Report No. 050-346/76-13)

The corrective action for this matter as delineated in the licensee's letter of August 30, 1976, could not be verified because of the on going containment vessel integrated leak rate test. This matter remains open.

Other Significant Findings

A. Systems and Components

1. Unresolved Item - Raceway Overfill Limits

Conduit fill limits did not appear to be adequately controlled. (Paragraph I.d.(5), Report Details)

2. Unresolved Item - Failure to Establish Control Systems

Control systems are to be developed by mechanical contractors performing EIR rework to identify and document rework performed in accordance with the recommendations of Engineering Inspection Reports. (Paragraph I.d.(3)(c), Report Details)

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

Contrary to the Final Safety Analysis Report (FSAR), Section 8, Paragraph 8.1.5, Item 3; Section 9, item g; and the National Electric Code (NEC) Section 300-19, the licensee inappropriately revised Specification 7749-E-14, Revision 11, i.e., support of control and instrument cables routed in vertically installed conduit are not adequately considered. (Paragraph I.d.(1), Report Details)

F. Status of Previously Reported Unresolved Items

1. Inappropriate Closure of Nonconformance Reports (NCR's)
(IE Inspection Reports No. 050-346/75-03, 75-07, 75-13,
75-16, 75-20, 75-23, 75-24, 76-02, 76-13 and 76-14)

Documentation received from CVI Corporation regarding the charcoal used in the filters is considered incomplete. This item remains unresolved.

2. Equipment Secured by "Hilti-Kwik" Devices (IE Inspection Reports No. 050-346/75-10, 75-15, 75-16, 75-20, 75-23, 75-24, 76-02, and 76-13)

Approximately 50 of 77 items will require a "fix" due to inaccessability of bolts. This matter remains unresolved.

3. Motor-Operated Valves (IE Inspection Reports No. 050-346/75-15, 75-16, 75-20, 75-23, 75-24, 76-02 and 76-13)

This item remains unresolved.

4. Reactor Protection and Safeguard System Cabinets (IE Inspection Reports No. 050-346/75-23, 75-24, 76-02 and 76-13)

This matter remains unresolved.

5. Identification Requirements of IEEE 279 (IE Inspection Reports No. 050-346/76-02 and 76-13)

This matter remains unresolved until physical installations of identification tags are completed and verified.

6. Unclear QA Program Requirements IE Inspection Report No. 050-346/76-13)

This item was not reviewed during this inspection and remains unresolved.

7. Channel Designation and Separation (IE Inspection Report No. 050-346/76-13)

Based upon the inspector's review of Revision 20 to the Final Safety Analysis Report (FSAR), Section 8.3.1.2.5, and information contained in the Cable Separation Log, this item is considered resolved.

8. Questionable Lack of Instrument Calibration (IE Inspection Report No. 050-346/76-13)

The Contractor, Brand Industrial Services, Incorporated, contends that the calibration of the gauges in question does not affect the product quality and that this matter had been previously reviewed with the NRC. This item will be reviewed further and remains unresolved.

9. Documentation of Reworked Items (Electrical Contractor) IE Inspection Report No. 050-346/76-13)

The inspector reviewed the flow chart developed by the electrical contractor, Fischbach and Moore (F&M), indicating a system to identify and document rework performed in accordance with the recommendations of the Engineering Inspection Reports. Further, the inspector reviewed records which indicated that the system had been implemented. This item is considered resolved.

10. Apparently Deficient EIR Log Book (IE Inspection Report No. 050-346/7613)

The inspector reviewed the Engineering Inspection Report (EIR) Log Book relative to items reported closed out and determined that adequate information is being provided to substantiate conclusions. This item is considered resolved.

11. Apparently Incomplete Documentation (IE Inspection Report No. 050-346/76-13)

The inspector reviewed a letter BCMLF4-3990 dated July 9, 1976, informing F&M that all rework relative to EIRs require F&M QC inspection and acceptance. This item is considered resolved.

12. Battery Room Conduit Sealoffs (IE Inspection Report No. 050-346/76-13)

The inspector observed that battery room 429 was provided with conduit sealoffs. This item is considered resolved.

13. Essential Cable Manhole Identification (IE Inspection Report No. 050-346/76-13)

The inspector observed, that manholes 3001 and 3005 were appropriately identified. This item is considered resolved.

14. Containment Vessel Particulate Monitoring System (IE Inspection Report No. 050-346/76-13)

Revision 20 to the FSAR, Section 11.4.2.1 and Figure 11-50 in reference to the containment vessel particulate monitors appears appropriate. This item is considered resolved.

15. Inadequate Certification Document (IE Inspection Report
No. 050-346/76-13)

This item was not reviewed during this inspection and remains unresolved.

Management Interview

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

Toledo Edison Company (TECO)

R. E. Blanchong, Construction Superintendent
M. D. Calcamuggio, Plant Electrical Systems Engineer
G. W. Eichenauer, Quality Assurance Engineer
J. M. Lastovka, CEI/TECO Senior Electrical Engineering (Quality Assurance)
J. D. Lenardson, Quality Assurance Manager
E. C. Novak, General Superintendent Power Engineering and Construction

Bechtel Corporation (Bechtel)

P. P. Anas, Project Engineer (Gaithersburg)
J. A. Arn, Engineering Manager (Gaithersburg)
S. M. Cantor, Engineering Supervisor (Gaithersburg)
J. Gonzalez, Engineering Inspection Team Leader (Gaithersburg)
C. D. Miller, Assistant Project Engineer (Gaithersburg)
R. Rosenthal, Project Manager (Gaithersburg)
J. A. Yesko, Engineering Inspection Team Member (Gaithersburg)

- B. Matters discussed during the interview were as follows:
1. Status of previously identified items of noncompliance. (Licensee Action - Enforcement Items and Deviations, Report Summary)
 2. Status of corrective actions relative to the Special Electrical Inspection. (Paragraph 1, Report Details)
 3. Items of noncompliance identified during the inspection. (Enforcement Items, Report Summary)
 4. Unresolved Items and Deviations Identified during the inspection (Significant Findings, Report Summary)

5. Relative to the Special Electrical Inspection, no overall conclusion could be made until the inspectors discussed their findings with appropriate IE management.
6. Cleanliness and overall maintainence of electrical system components, such as panels, compartments and equipment boxes was determined to be marginal, however, general plant areas were acceptable.
7. The licensee did not commit to any firm schedule for completion of work relative to the 5000 series of Engineering Inspection Reports, Class 1E conduit seismic supports or installation of fire barriers.
8. Subsequent to the inspection, the licensee committed to perform an audit of design document E300B and logs kept at the Bechtel Gaithersburg office for control and analysis of raceway fills. (Other Significant Findings, Item A.1, Report Summary)

REPORT DETAILS

Persons Contacted

The following persons in addition to those listed in the Management Interview section of this report, were contacted during this inspection.

Bechtel Corporation (Bechtel)

R. Reinecke, Field Engineer

Brand Industrial Services Company (BISCO)

H. J. Russell, Project Manager

W. Zmed, Quality Control

Fluor Pioneer Incorporated (Fluor)

M. Abbas, Mechanical Engineer

1. Special Electrical Inspection

- a. The purpose of the inspection was to determine if the licensee had corrected deficiencies identified by the Bechtel Engineering Inspection Team (EIT) while performing a 100% reinspection of all class IE site installed electrical equipment, wiring, cable and raceway.
- b. Methods included:
 - (1) Review of EIT documented engineering inspection records (EIR) relative to reinspection of: essential cables (100 series), cable separation (2000 series) equipment exposed to adverse environment (5000 series) and Class IE conduit supports.
 - (2) Review of pertinent EIR analysis/resolution by Bechtel Gaithersburg Power Division (GPD), and site Conduit Engineering Group.
 - (3) Observation to verify that no new deficiencies were identified relative to:
 - (a) Cable routing including separation.
 - (b) Raceway physical overloading.

- (c) Excessive bending radius.
 - (d) Cable support.
 - (e) Cable separation within control cabinets.
 - (f) Adverse environment, i.e., high pressure high temperature, etc., or adjacent to potentially hazardous nonseismic equipment.
 - (g) Conduit support.
- c. As of September, 1976, the licensee reports the following status of completed reinspection areas:
- (1) Installation of essential cables - 100%.
 - (2) Cable separation - 99%.
 - (3) Adverse environment - 20%.
 - (4) Class 1E seismic conduit supports - 75%.
- d. The inspectors determined the following:

(1) 100 Series

Except for EIR Item No. 447, all 17 EIR's reviewed by the inspector had been completed by the licensee in accordance with all elements of the recommended Gaithersburg Power Division (GPD) analysis/resolution including, as appropriate, followup through individual contractor's nonconformance system.

EIR No. 447 is relative to cables routed in vertically installed conduit Nos. 38422C and 36071A. The Engineering Inspection Team (EIT) member noted that neither cable clamps nor supports were provided in accordance with Bechtel Specification 7749-E-14, Paragraph 10.3.2.E which references Section 300-19 of the National Electric Code, (NEC).

GPD analysis for the above was provided in Bechtel letter No. BCC:4483 dated March 12, 1976, No. 11. Specification E14 was revised and states in part that "Power Cables are to be supported in accordance with NEC

requirements. (However,) control or instrumentation cable in vertical conduit runs that are 20 feet or longer are to be supported at the upper end only if the cable terminates at the upper end and exerts a strain on the terminals."

(Emphasis added) Cables in the afore mentioned conduits were not supported, because the above criteria (underlined) was not met.

The inspector concluded that the specification change was inappropriate and contrary to the intent of NEC 300-19 and good engineering practice. Commitment to NEC is made in FSAR Section 8, Paragraph 8.1.5, Item 3 and Section 9, Item g. Cognizant licensee personnel were advised that this matter would be reported as a deviation.

(2) 2000 Series

- (a) Except for three items, EIR Nos. 2152, 2157 and 2511, all 16 items reviewed by the inspector had been completed by the licensee in accordance with all elements of the recommended Gaithersburg Power Division (GPD) analysis/resolution including, as appropriate, followup through individual contractor's nonconformance system.

EIR Nos. 2152, 2157 and 2151 are relative to exceeding the minimum bending radius of cables. Part of the recommended action/analysis, was to rework said cables in order to increase bending radius. It did not appear that any attempt whatsoever was made to correct the problem. No documented evidence was available indicating that: (1) work had been attempted or accomplished (other than insulation resistance testing), (2) why work could not be accomplished, and (3) design approval of existing conditions had been obtained. Considering the above, the EIT still made an acceptance finding.

The IE Inspector identified the above as an infraction, contrary to 10 CFR 50 Appendix B, Criteria X. Cognizant licensee personnel were so advised.

- (b) Corrective action to EIR Items 2515 and 2516 appeared to have inadvertently compromised. In one case, installed cable supports had been cut and in another cables were disarranged to preclude placement of required covers. This matter was determined to be an Infraction, contrary to 10 CFR 50, Appendix B,

Criterion XIV. (Similar observations were reported in IE Inspection Report No. 050-346/76-13, Paragraph 2.f, Report Details)

(3) 5000 Series

- (a) The inspector reviewed documentation relative to 64 EIR's. Records indicated that Fischbach and Moore (F&M) QC appropriately inspected the completed work before inspection and acceptance by the final Engineering Inspection Team (EIT). The acceptance of reworked items by the EIT was transmitted to the field via a letter from Bechtel, Gaithersburg. The inspector reviewed NCR B-149A and determined that adequate information was not provided to incorporate the change in location of a junction box. Prior to conclusion of the inspection, Design Change Notice (DCN 2030) was prepared requesting that drawing E335 be revised to reflect the above mentioned change. The inspector concluded that the records were satisfactory.
- (b) The inspector randomly selected and verified by observation that work performed and accepted by the EIT relative to closed out EIR items was acceptable.
- (c) A control system to identify and document rework and inspections performed in accordance with recommendations provided in EIR's has not been developed by Lum Irsay the HVAC contractor. Recommendations include upgrading supports of HVAC duct work to seismic Class I. Lum Irsay's subcontractor, Fluor Pioneer, Inc. has personnel on site to design seismic Class I supports. During interviews with plant personnel, the inspector stated that a system must be established to identify actual materials used, work performed, QC inspections involved and notification of the EIT that work has been satisfactorily completed. The inspector stated that a similar system must also be developed by ITT Grinnel who will be upgrading pipe supports to Seismic Class I. This item was identified as unresolved.

(4) Class IE Conduit Supports

The inspector randomly verified rework accomplished relative to Class IE Seismic Conduit Supports and determined that the conduit supports were appropriately tagged identifying the status of rework and inspected by F&M QC and the Conduit Support Team. The inspector reviewed pertinent records prepared by F&M relative to rework of conduit supports and determined that the records

identified materials used, weldor, welding inspector and drawing to which the support was fabricated. Qualification records of two weldors were reviewed and determined to be current. The inspector informed the licensee that he had no further questions at this particular time.

(5) Other Observations

The inspector observed Conduit No. 27708A at Motor Control Center BE11D. The optimum fill limit appeared to have been exceeded. A check of Bechtel document E300B disclosed that said conduit was "flagged" as being overfilled at 42%. A further review of E300 B indicated that several other conduits were also "flagged," one in particular No. 28265A, indicated 92%. Conduit No. 28265A contained two cable. In accordance with Bechtel's "Engineering Procedures Manual" Section 5.19.3.4, a conduit with two cables is optimumly filled at 37%.

The inspector was informed that all situations of this type (conduit and tray overfills) are individually logged and analyzed for acceptance or rejection in accordance with the above procedures manual, however, this information was on file at the GPD office and not available at the site.

Subsequent to the inspection the licensee made certain commitments (Item 8, Management Interview, Report Summary). This matter is considered unresolved pending review of the licensee's audit results.

(6) Engineering Inspection Report Records Review

(a) 100 Series

125	310	468	667
188	386	473	700
240	423	476	
250	426	576	
225	447	599	

(b) 2000 Series

2152	2231	2488	2509
2188	2307	2491	2516
2193	2387	2511	2526
2230	2455	2515	2552

(c) 5000 Series

5002	5077	5214	5266	5428
5010	5113	5215	5276	5455
5011	5156	5216	5280	
5029	5162	5222	5281	
5034	5173	5223	5305	
5035	5174	5225	5306	
5037	5175	5226	5316	
5039	5176	5239	5320	
5041	5178	5245	5329	
5047	5179	5246	5355	
5064	5180	5250	5392	
5065	5183	5256	5393	
5072	5196	5262	5394	
5075	5197	5264	5395	
5076	5213	5265	5396	

(d) Conduit Supports

1881-501-11-2	2002-500-16-2
1903-501-33-2	2004-500-18-2
7463-501-SW	1094-427-02-2
8042-501-SW	713-105-22-1
7825-501-SE	714-105-23-1
CS 1936-501-66-3	715-105-24-1
CS 1990-500-04-1	716-105-25-1
2001-500-15-2	717-105-26-1

2. Penetration Seals and Block-Out Closures

- a. In reference to the licensee's letter to IE dated August 30, 1976, in reply to apparent noncompliances, (Item A.3), the inspector determined that: (1) neither flame resistance tests for boot material nor boot material had been received; (2) no basis for removal of requirements for identification for chemical or physical properties for specification 7749-M-255 could be established; (3) boot materials will in some cases be in direct contact with stainless steel piping yet no requirement in Specification 7749-M-255 exists for Halogen content test data; (4) the hose stream test certification supplied by the Portland Association dated July 28, 1976, was unacceptable.
- b. Reference letter in "a" above, Item B, the inspector determined that BISCO QC personnel experience, training and qualification records were available and acceptable. Production personnel experience records were acceptable, however, qualification and training records were not acceptable because no criteria had been established which would indicate that minimum qualification or training requirements were being met.