UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-346/76-13

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

Davis-Besse Nuclear Power Station
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: June 8-11, 1976

Principal Inspector: C. C. Williams — 7/19/76 (Date)

Accompanying Inspectors: F. Jablonski — 7/19/76 (Date)

K. Naidu — 7/19/76 (Date)

T. Harpster — 7/19/76 (Date)

R. Paolino
(Region I) — 7/19/76 (Date)

Other Accompanying Personnel: D. W. Hayes

J. C. LeDoux

Reviewed By: D. W. Hayes, Chief
Projects Section — 7/19/76 (Date)

8001300 705

SUMMARY OF FINDINGS

Inspection Summary

Inspection of June 8-11, 1976 (76-13): Reviewed status and results to date of the licensees special reinspection of wiring, raceways and other electrical installations. Reviewed previously identified items of noncompliance. Observed work activity and reviewed QA/QC considerations for installation of fire barriers and seals. Six items of noncompliance and one deviation were identified relative to electrical and fire sealant material installations.

Items of Noncompliance

A. Infractions

1. Contrary to 10 CFR 50, Appendix B, Criterion V, reworked electrical items were not inspected by the Engineering Inspection Team as specified in Procedures EIP-008-5, Revision 2, dated November 20, 1975 and EIP-008-1, Revision 3, dated November 7, 1975. (Paragraphs 3.c.(1) and (6), Report Details)

2. Contrary to 10 CFR Part 50, Appendix B, Criterion XVI, the licensee failed to identify and/or take corrective action for a condition adverse to quality relative to essential channel I and II cables located in cabinet C5716 which were found to be in contact with nonessential cables located in the same cabinet. (Paragraph 8.e, Report Details)

3. Contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion VII, and Bechtel Specification No. 7749-M-255, Brand Industrial Services sealant materials had been installed although it had not been established that the material met specification requirements. Furthermore, this matter had not been identified by the licensee as nonconforming. (Paragraph 1.c.(3)(a), Report Details)

B. Deficiency

1. Contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion XVII, neither qualification nor indoctrination and training records were available at the site for Brand Industrial Services (BISCO) QA/QC and production personnel. (Paragraph 1.c.(2), Report Details)

2. Contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion V, and Brand Industrial Services, Inc., Quality Control Procedure No. 006; an approved range of acceptable sealant material densities used for acceptance criteria was not available at the site. (Paragraph 1.c.(3)(s), Report Details)

3. Contrary to the requirements of 10 CFR Part 50, Appendix B, Criteria V, and the Toledo Edison Company QA Manual Section 5.7.3, The Brand Industrial Services, Inc., Sealant Material Mixing Procedure No. 207M, was not available at the site, and had not been approved for use at the site. (Paragraph 1.c.(3)(c), Report Details)

Licensee Action on Previously Identified Enforcement Items

A. Borated Water Storage Tank - Failure To Report (IE Inspection Report No. 050-346/76-02)

The proposed corrective action for the above item is outlined in Toledo Edison's NCR number 888. In response to Region III's letter dated March 12, 1976. The licensee responded to the notice of an infraction in a letter dated April 12, 1976 and submitted an interim report per 10 CFR Part 50, Paragraph 50.55(e) dated February 20, 1976. Repair of the storage tank is incomplete. The infraction aspects of this matter are considered resolved. The submittal of the final report and implementation of the proposed repair are open items and will be reviewed during a subsequent IE inspection.

B. Indoctrination and Training Records Not Available (IE Inspection Report No. 050-346/76-02, Paragraphs 1.a.(5) - (7))

The corrective action for the subject item as outlined in the Toledo Edison Company (TECO) letter dated April 12, 1976 in response to Region III letter dated March 12, 1976, was examined during this inspection. Indoctrination training and qualification records for 21 Johnson Controls Company QA and inspection personnel were examined and considered acceptable. This matter is resolved.

Licensee Action on Previously Identified Deviations

Electrical Fire Barriers (IE Inspection Report No. 050-346/76-02 Paragraph 2.c)

The licensee has detailed further commitments regarding fire barriers in Toledo Edison Company's response letter to Region III, dated April 12, 1976.

Fire barrier criteria are delineated in Bechtel Drawing No. 7749-E-302A, sheets 16A and 16B. Bechtel Drawing No. E 356, sheets 12, 13, and 14, provide details for fire barrier installations within the cable spreading area. (Neither set of drawings has been accepted by TECO as yet.) Requirements for fire barrier installations outside the spreading room have not been identified on drawings.

Asbestos free marinite has been identified as the rigid thermal insulating material to be used as a fire barrier. No installations have been made as of June 11, 1976.

This matter remains open pending further IE inspections that establish: (1) All areas requiring fire barriers have been identified and documented on drawings, (2) Referenced drawings are approved by TECO, and (3) Installations are in accordance with approved drawings.

Other Significant Findings

A. Systems and Components

1. Unresolved Item - Unclear QA Program Requirements

Various areas of The Brand Industrial Services, Inc., (BISCO) QA program are unclear in their response to 10 CFR Part 50, Appendix B requirements. (Paragraph 1.c.(1)(a), Report Details)

2. Unresolved Item - Channel Designation and Separation

a. Channels 1 and 3 are common for Inverter YV3. In terms of the channel separation requirement this does not appear acceptable. However, the licensee indicated that a basis for the acceptability of this commonality of channels would be made available. (Paragraph 7.c, Report Details)

b. The 125V DC supply cables in essential DC distribution panels D1N, D1P, D2N, and D2P do not appear to meet the separation criteria as stated in the FSAR Section 8, Paragraphs 8.3.1.2.25 and 8.3.2.2.7. Further review of this matter as to engineering justification is planned. (Paragraph 7.b, Report Details)

3. Unresolved Item - Questionable Lack of Instrument Calibration

The Brand Industrial Services, Inc. Electro - Mechanical device used to proportion and blend sealant materials has temperature and speed control devices which are not calibrated. (Paragraph 1.c.(1)(c), Report Details)

4. Unresolved Item - Documentation of Reworked Items

A system is to be developed to identify and document rework performed in accordance with the recommendations of Engineering Inspection Reports. (Paragraph 3.c.(3), Report Details)

5. Unresolved Item - Apparently Deficient EIR Log Book

Adequate information is to be provided in the Engineering Inspection Report (EIR) Log Book on items reported closed out to substantiate conclusions. (Paragraph 3.c.(5), Report Details)

6. Unresolved Item - Apparently Incomplete Documentation

Verification is required whether BCM FL 14-3672, dated April 6, 1976, which addresses itself to EIRs 1 through 668 and 2000 series should also encompass EIRs 5000 series. (Paragraph 3.c.(7), Report Details)

7. Unresolved Item - Battery Room Conduit Sealoffs

The use of an explosion proof box without conduit sealoffs in battery room 429B is questionable. (Paragraph 7.d, Report Details)

8. Unresolved Item - Essential Cable Manhole Identification

Manhole(s) containing essential cables are not identified. (Paragraph 8.d, Report Details)

9. Unresolved Item - Containment Vessel Particulate Monitoring System

Final Safety Analysis Report (FSAR) instructions, tables, and as-built parameters appear to be in conflict. (Paragraph 8.f, Report Details)

B. Facility Items (Plans and Procedures)

Unresolved Item - Inadequate Certification Document

The Brand Industrial Services, Inc. material certification document does not appear to provide adequate information to establish a basis for acceptance of material at the site. (Paragraph 1.c.(1)(b), Report Details)

C. Managerial Items

The inspectors were informed that Mr. G. L. Roshy has replaced Mr. D. M. Moeller as site Q. C. Manager for Fischbach and Moore, Incorporated, (the electrical contractor). This change occurred May 1, 1976.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviation

Contrary to the FSAR Section 11, Paragraph 11.4.2.1, the installation of the reactor vessel particulate monitor will not provide a representative sample. (Paragraph 8.f, Report Details)

F. Status of Previously Reported Unresolved Items

1. Identification Requirements of IEEE 279 (Inspection Report No. 050-346/76-02) (OPEN)

Revision No. 18 to the Final Safety Analysis Report now indicates, in figure 7-1, that instruments are listed in accordance with the Master Instrument Index.

The licensee has established a system for distinctly identifying field components in the reactor protection system as documented in Bechtel letters No. 4674 dated May 7, 1976 and No. 4697 dated May 10, 1976. This item remains unresolved until physical installations of the identification tags are complete and verified.

2. Inappropriate Closure of Nonconformance Reports (NCR's) (Inspection Reports No. 75-03, 75-07, 75-13, 75-16, 75-20, 75-23, 75-24 and 76-02) (OPEN)

Documentation regarding charcoal used in filters supplied by CVI Corporation is discrepant. This matter was not examined during this inspection and remains unresolved.

3. Incomplete Test Data (Inspection Reports No. 75-03, 75-07, 75-13, 75-16, 75-20, 75-23, 75-24 and 76-02)

Rupture test of filters is being evaluated. This matter was not examined during this inspection and remains unresolved.

4. Equipment Secured by "Hilti-Kwik" Devices (IE Inspection Reports No. 75-10, 75-15, 75-16, 75-20, 75-23, 75-24, and 76-02) (OPEN)

This matter was not examined during this inspection and remains unresolved.

5. Motor Operator Valves (IE Inspection Reports No. 75-16, 75-10, 75-21, 75-23, 75-24 and 76-02) (OPEN)

This matter was not examined during this inspection and remains unresolved.

6. Reactor Protection and Safeguard System Cabinets (IE Inspection Reports No. 75-23, 75-24 and 76-02) (OPEN)

The protection and safeguard systems internal cabinet wiring appears to be in conflict with IEEE-279, 1971, Section 4.7.2. This matter has been referred to IE Headquarters for resolution and remains unresolved pending receipt of their response.

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 and Development
E. C. Novak, Project Engineer
J. D. Lenardson, QA Manager
G. W. Eichenauer, QA Engineer
M. D. Calcamuggio, Electrical Engineer
R. F. Blanchong, Construction Superintendent

Nuclear Regulatory Commission IE:III

J. C. LeDoux, Chief, Engineering Section
D. W. Hayes, Chief, Projects Section
R. D. Martin, Reactor Inspector (Test and Startup)
J. E. Foster, Investigation Specialist

Bechtel Corporation (Bechtel)

C. L. Huston, Field Construction Manager
S. M. Cantor, Electrical Engineer
C. D. Miller, GPDE

Cleveland Electric Illuminating

J. M. Lastovka, QA Engineer

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

1. The inspector stated that his review of the blockout sealant contractors QA/QC program, test and certification records, and sealant installation activity disclosed several items of noncompliance and unresolved matters, the details of which are identified herein. The licensee's management acknowledged these remarks. (Paragraph 6, Report Details)

2. The inspector stated that his review of the specification and design parameters of safety relief valves numbers PSV1529, PSV1550, PSV1510 and PSV2761 identified on drawing No. A2616 Revision F showed that ASME code and specified application requirements were complied with.

   The licensees representatives acknowledged this remark.

3. The inspector stated that he reviewed the status of the primary system valve installations, relative to their impact on the forthcoming primary system hydrostatic test. It appears that only one primary system valve remains to be installed. The installation of this valve was in progress during this inspection. It was reported that all balance of plant valves required for the hydrostatic test are in place.

4. The inspector stated that he reviewed the corrective action taken in regard to the lack of training and indoctrination records for the Johnson Controls QA/QC personnel. This review showed that all such records and certifications are now available at the site.

   The licensee's management acknowledged this remark.

5. The inspector stated that he discussed with F&M the history of welding activity on seismic supports for electrical conduit and other electrical components at the site. While this activity was not fully inspected during the current inspection the inspector indicated that the intended goal of a future inspection examination was: (1) to establish what welding records are available and the number of "uninspected" welds made prior to the identification of these components as

safety related, and (2) to examine the corrective actions and results taken by TECO and its contractor in regard to this welding. The licensee's representatives acknowledged these remarks.

6. The inspector stated that he reviewed the progress of corrective action for the buckled borated water storage tank and the associated 10 CFR Part 50.55E documentation. The status of corrective action is commensurate with TECO commitments.

7. The inspector stated that relative to the followup electrical inspection, considerable rework by the licensee is still required in all areas and further OIE inspection would be required. (Paragraph 2, Report Details)

8. The inspector stated that an evaluation of cable separation was made relative to the 2000 series of Engineering Inspection Reports (EIR). During visual inspection, discrepancies were determined to have been corrected per the provided Bechtel engineering analysis. No new significant discrepancies were identified. (Paragraphs 2.b, 3.c, 3.e, and 3.f, Report Details)

9. The inspector stated that he reviewed documents relative to the General Electric Company static trip devices for AK3-25 and AK3-50 air circuit breakers and possible reporting requirements per 10 CFR 50.55(e). (Initial licensee NRC contact was made by telephone on May 13, 1976). The licensee stated that this matter was considered to be reportable and would be reported in the very near future.

10. The inspector stated that he reviewed TECO supplied documentation relative to the identification of field mounted instruments in accordance with IEEE 279. Implementation will be verified by OIE inspectors.

11. The inspector stated that he reviewed newly established fire barrier criteria and relative drawings. Drawings require approval, barrier requirements outside of the spreading room have not been established and installations have not been verified by OIE inspectors.

12. The inspector stated he reviewed corrective action taken on the EIRs relative to Adverse Environment Conditions, (Series 5000) the Field Fabrication of Conduit Supports and the installation inspections being performed by F&M/CE. During the review, the inspector identified one item of noncompliance,

failure to conduct inspections as per procedures, and three unresolved items. (Paragraphs 3.c.(1), 3.c.(3), 3.c.(5), and 3.c.(7), Report Details)

13. The inspector summarized the findings with regard to the installation of essential electric cable and in particular, the review of the licensee Engineering Inspection Reports (EIR's). Three unresolved matters were identified relative to cable separation in essential DC distribution panels, a channel designation anomaly, and a questionable electrical installation in the 1A battery room.

    The licensee acknowledged these remarks. (Paragraph 7, Report Details)

14. The inspector summarized the findings (cable seperation) with representatives of the licensee and contractor organizations, and reported that he had identified an infraction relative to essential channel separation, a deviation relative to the construction of the containment particulate sampling system and two unresolved matters involving the identification of essential cable manholes and the apparently un-isokinetic construction of the containment particulate monitoring system. (Paragraph 8, Report Details)

Persons Contacted

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

Bechtel Corporation (Bechtel)

W. C. Lowery, Electrical Quality Assurance Engineer
J. Gonzales, Engineering Inspection Team Leader
S. Saba, Electrical Supervisor, Gaithersburg (GPD)
J. Yesko, Engineer, (GPD)
R. Yamrus, Engineer (GPD)
R. W. Jackson, Supervisor Mechanical (GPD)
L. Meyers, Small Pipe Design
M. Patel, Civil Engineering (GPD)
J. T. Vogel, Assistant Civil Engineering Supervisor (GPD)
G. Decker, Assistant Chief Engineer Civil (GPD)
R. McDonald, Civil Engineer
J. DeVoge, Civil Engineer
R. Glass, Lead Field Engineer Electrical
G. Aller, Assistant Field Engineer

Fischbach and Moore, Incorporated (F&M)

A. E. Auble, Lead QC Inspector
W. L. Columbia, Assistant Project Engineer
F. Kollin, Project Manager
G. D. Kraus, Lead Field Engineer
G. L. Roshy, QC Manager
T. H. Winhoven, Electrician
H. Fosholdt, QC Specialist
R. Wallace, QA Inspector
J. Harris, QC Documentation Coordinator
W. Wolever, Electrician
T. Farmer, Engineer
F. Fishback, Electrician
S. Fox, Engineer

Johnson Controls, Incorporated, (JCI)

R. W. Jones, QA Manager
M. A. Barnhart, Inprocess Inspector

Brand Industrial Services, Inc. (BISCO)

H. J. Russel, Site Manager
W. Zmed, QC Inspector
T. Gilmore, Project Foreman

Toledo Edison Company (TECO)

E. Wilcox, Field QA Specialist
P. Narducci, Field QA Specialist
C. Daft, Field QA Engineer

1. Penetration Seals and Block-out Closures

a. Inspection Objective

The objective of this inspection was to examine the contractor's QA/QC program and its implementation relative to: (1) personnel and instrumentation qualifications, (2) test and installation records, and (3) material certification for compliance to the specifications and TECO QA program commitments. The contractor for this work is Brand Industrial Services, Inc. (BISCO).

b. Inspection Objectives Accomplished By:

(1) Review and examination of the BISCO QA program Manual No. 114 approved by TECO on December 16, 1974.

(2) Review and examination of the associated BISCO QC procedures i.e., MP-207, QCP-009, Mixing procedure No. 207, QCP-003, QCP-004, QCP-005, QCP-008 and IP-207.

(3) Review and examination of the TECO-BISCO specification No. 7749-M-255, "for furnishing and installation of penetration seals and block-out closures."

(4) Discussion with TECO and BISCO management personnel and craftsmen.

(5) Observation of the mixing of sealant material components (Isocyanate Resin), and the associated acceptance standard.

(6) Observation of class-1 placements of the sealant i.e., electrical conduit item No. 7034, and No. 7033.

c. Inspection Findings

The contractor's installation crew and QC personnel appeared capable, and installation of the isocyanate resin sealant in class-1 locations had commenced prior to this inspection. With the significant exception of the items identified below, the areas reviewed appeared to meet the TECO specification requirements.

(1) Unresolved Matters

(a) The following areas of the BISCO QA program manual did not clearly respond to the requirements:

The QA program does not appear to address or reference a criteria for its basis. The BISCO QA program section QAP-4, apparently in response to 10 CFR Part 50, Appendix B, Criteria 9, does not clearly address the subjects of "qualified procedures and qualified personnel."

The BISCO QAP-No. 8, an apparent response to 10 CFR Part 50, Appendix B, Criteria 7, does not clearly address "required conformance to procurement documents" nor does it address "effectiveness evaluation" of BISCO vendors. The BISCO QA program does not address the training and indoctrination of production personnel or QA/QC personnel.

(b) Material certifications provided by BISCO for the various components of the sealant material do not appear to meet the criteria necessary to demonstrate conformance to 10 CFR Part 50, Appendix B, Criteria 7. The present certification (1) does not identify the authority of the person who signed it, (2) does not identify those specification parameters which have not been met, nor does it address the specific identity of the quality requirements. (Also see Paragraph 1.c.(3)(a) below). The licensee indicated that this matter would be further examined.

(c) The BISCO Electro mechanical device used to proportion mix and install the isocyanate resin sealant, has an array of speed (RPM) and temperature control devices. These device are not calibrated. BISCO

management contends th. the set points on this device have no effect on quality. During the inspectors' examination, mixing personnel indicated that if the set points were changed the "quality" of the product would also change. During this inspection the facts were not established. It appears on the basis of the inspectors examination, that these control devices should be calibrated in response to 10 CFR Part 50, Appendix B, Criterion 12. The licensee indicated that they would further examine this matter.

(2) Deficiencies

Contrary to 10 CFR Part 50, Appendix B, Criterion 17, neither certifications nor training records were available to verify that BISCO QA/QC and appropriate production personnel had received indoctrination, training and/or other measures to demonstrate and facilitate proficiency in performing quality related activities.

A BISCO representative indicated that such records exist at their home office in Illinois. The inspector pointed out that the documented BISCO QA/QC program fails to include sealant mixing and production personnel in the specified training and indoctrination measures.

(3) Infractions

(a) Contrary to 10 CFR Part 50, Appendix B, Criterion 7, which states in part that "Documentary evidence that material and equipment conform to procurement requirements shall be available at the nuclear power plant site prior to installation or use of such material and equipment", BISCO isocyanate resin sealant had been placed in class-1 locations although sealant material testing requirements of the specification had not been performed. BISCO material certifications erroneously indicate that materials comply with "all applicable P.O. specification requirements." TECO to BISCO specification No. 7749-M-255, paragraphs 7.1 through 7.5, specify that documented test results demonstrating flame resistance, chemistry and physical properties, halogen content, and hose stream tests of the sealant shall be provided. Such test documentation was not available. Infact, performance of some tests was not planned until July, 1976. This nonconformance was not documented by TECO nor BISCO.

(b) Contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion V which states in part that "Activities affecting quality shall be prescribed by documented - - - procedures - - - and shall be accomplished in accordance with these instructions, procedures . . ." and BISCO quality control procedure No. 006 paragraph 2.1.1.6 which requires that "a range of acceptable sealant densities" be submitted to the site; such a document showing a range of sealant acceptance criteria was not available. Furthermore, no documentation was at the site to establish that the one density reference standard available met procedural requirements, i.e., was within the acceptable range of sealant densities.

(c) 10 CFR Part 50, Appendix B, Criterion V, states in part that "activities affecting quality shall be prescribed by documented instructions, procedures, - - - and shall be accomplished in accordance with these instructions procedures, or drawings." Further, the Toledo Edison QA manual section 5.7.3 states in part that "The Toledo Edison Manager, quality assurance is responsible for jointly approving the QA aspects of procedures which assure control of purchased Q-listed items and services." Contrary to the above, BISCO sealant mixing procedure No. 207M referenced by Installation Procedure No. 207 was not available at the site and had not been reviewed nor approved by Bechtel and Toledo Edison.

2. Follow-up 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 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, cable separation and equipment exposed to adverse environment.

(2) Review of pertinent EIR analysis/resolution by Bechtel, Gaithersburg Power Division (GPD).

(3) Direct OIE observation to verify that no new deficiencies were identified relative to:

(a) raceway identification

(b) raceway debris

(c) raceway sharp edges at entry, exit or other routing points

(d) cable identification

(e) cable damage

(f) raceway physical overloading

(g) excessive bending radius

(h) cable support

(i) cable routing including separation

(j) matching cable pull card and circuit schedule

(k) adverse environment, i.e. high pressure, high temperature or adjacent to potentially hazardous nonseismic equipment

(l) cable separation within control cabinets

c. All elements of the recommended GPD disposition had been implemented, i.e. work completed according to the analysis/resolution including, as appropriate, follow-up through individual contractor's nonconformance system and Engineering Class I conduit hanger group.

d. As of May 25, 1976, the licensee reports the following status of completed reinspection areas:

(1) installation of essential cables - 85%

(2) cable separation - 70%

(3) adverse environment - minimal

(4) Class 1-E seismic conduit supports - no report

e. Findings relative to cable separation (EIR, series 2000).

The OIE inspector reviewed 40 Bechtel Engineering Inspection Reports (EIR), including pertinent analysis, and observed corrective action taken. The sample included areas of motor operated valves, motor operated valve local control stations, motor control centers, 480 volt switchgear, 4.16 KV switchgear, local and remote diesel generator control panels, safety features actuation system (SFAS) panels, reactor protection system (RPS) panels, RPS trip switchgear and battery rooms. Besides cable separation, other discrepancies were identified in the EIR including sharp edges, installation of raceway, support of cable, cable routing, improper terminations, raceway overfill, repair of damaged cable, excessive bending radius, and bridging of redunant cables.

Only 70% of the sample had been completely reworked and reinspected by the Engineering Inspection Team (EIT). Completed items appeared to have been satisfactorily corrected in accordance with the analysis/resolution provided by Bechtel including appropriate review and approval by TECO of the Cable Separation Record. Those items not completed were observed by the OIE inspector to be in various stages of completion. It was apparent that rework was being performed in accordance with the analysis/resolution provided, i.e. redundant channel cables were placed in flexible metal conduit where required, sharp edges protected, etc.. No new significant discrepancies were identified by the OIE inspector.

f. The inspector made the following observations:

(1) Cable supports which had been added to SFAS cabinets had either been subsequently removed or broken thus placing strain on plug terminations.

(2) Repaired electrical plug connections located at the bottom of SFAS cabinets were not protected to preclude further damage.

(3) SFAS cabinets had exposed electrical terminals at waist height which were not covered to preclude possible short circuiting.

The licensee's representative stated that appropriate resolution of items (1), (2) and (3) above would be pursued.

(4) Cables located in panel 5715 did not appear to be properly dressed or supported. F&M inspection pick up (IPU) No. 30510 identified this problem. The inspector was informed that 73 IPU's and 68 insepction reports (IR) remain outstanding, in addition to all other remaining rework items. Proper closeout of these items will be verified by OIE inspectors.

(5) Field installed Main Steamline Rupture Instrumentation (MSRI) mechanical separation barriers, impulse line protection and electrical separation requirements appeared to be adequate.

(6) With reference to IE Report 050-346/75-10, Details section, No. 16, cable conductors were verified not to have been jammed into remote push button control stations. Verification by OIE was made during an inspection performed August 18-20, 1975. This matter was inadvertently omitted from report No. 050-346/75-16.

g. EIR's, inspection records and other correspondence reviewed during the inspection include:

(1) TECO letters No. TB3243, No. TB3313 and No. 3323. (Cable Separation Log)

(2) TECO conference memorandum No. 300.375.06 (G. E. Breakers)

(3) Bechtel letters No. 4697 and No 4674 (Instrument idertification)

(4) Bechtel drawings E356, sheets 12, 13 and 14; and 7749-E-302A, sheets 16A and 16B. (Fire Barrier Criteria)

(5) Engineering inspection report numbers and F&M associated records as follows:

(a)	2017	(k)	2230	(u)	2307	(ee)	2490
(b)	2094	(l)	2231	(v)	2359	(ff)	2491
(c)	2102	(m)	2237	(w)	2382	(gg)	2492
(d)	2103	(n)	2238	(x)	2412	(hh)	2499
(e)	2134	(o)	2279	(y)	2419	(ii)	2509
(f)	2136	(p)	2283	(z)	2427	(jj)	2511
(g)	2152	(q)	2284	(aa)	2428	(kk)	2512
(h)	2154	(r)	2285	(bb)	2472	(ll)	2514
(i)	2188	(s)	2286	(cc)	2487	(mm)	2516
(j)	2193	(t)	2296	(dd)	2488	(nn)	2554

3. Review of Rework on Engineering Inspection Reports (Adverse Environment Considerations)

a. Inspection Objectives

To ascertain whether rework recommended on findings identified in Engineering Inspection Reports (EIRs) 5000 series relative to adverse environment and other considerations was performed, inspected and the items closed out.

b. Inspection Objectives Accomplished By

(1) Review of Procedure EIP-008-5, Revision 2, dated November 20, 1975.

(2) Review of Procedures EIP-008-1, Revision 3, dated November 7, 1975.

(3) Visual inspection of rework that had been reported as complete.

(4) Bechtel GPD letter to Bechtel Construction Manager and Toledo Edison Company - BBC 3990, dated November 21, 1975.

(5) Bechtel GPD letter to Bechtel Construction Manager and Toledo Edison Company - BBC 4299, dated February 10, 1976.

(6) Procedure for design of Class 1, Electrical Conduit Supports, Procedure No. CEPCS-1, Revision 2, dated November 5, 1975.

(7) Installation Procedure for Essential Hangers and Supports, IP-7749-E-14-6a.003, Revision 1, dated August 15, 1975.

(8) Installation Inspection Procedure for Essential Hangers and Supports IIP-7749-E14-7a.003, Revision 1, dated August 18, 1975.

c. Inspection Findings

(1) Noncompliance/Infraction

Procedure EIP-008-5, Revision 2, dated November 20, 1975, titled "Procedure for Installation Inspection of

Essential Electrical Equipme . for Exposure to Adverse Environment" Page 4, Paragraph 6.H, states, in part "Reinspection and closeout of EIR (Engineering Inspection Reports) items will be handled per EIP-008-1, Revision 3, dated November 7, 1975, Section 9.3."

Section 9.3 of the above procedure titled "Procedure for Installation Inspection of Essential Cables by Engineer Inspection Team" states, in part "As discrepant items are reported reworked by the responsible parties, the EIT (Engineering Inspection Team) will reinspect the rework and close out satisfactorily reworked items".

Contrary to the above requirements, EIRs were reported closed without the EIT reinspecting the reworked items.

The inspector stated that failure to follow procedures was an item of noncompliance/infraction and contrary to requirements of 10 CFR 50, Appendix B, Criterion V. (See Paragraph 3.c.(6) below)

(2) Upgrading Nonessential Conduit Supports to Seismic Class 1 to Preserve the Integrity of Essential Cables and Components

EIRs 5019, 5020, 5052, 5053, 5055, 5058, 5059, and 5061.

The above EIRs were resolved by the Ergineering Class-1 Conduit Hanger Team in the field by preparing conduit support drawings and generating data sheets which provided a means of cross-referencing the appropriate conduit support tabulation drawings, conduit support drawings and the plan view drawings.

These drawings were issued to Fischbach and Moore/Colgan Electric (F&M/CE) the electrical contractor for rework. F&M/CE reported completion of the rework and the items were reported closed.

F&M/CE did not maintain records of additional work performed on conduit supports to meet drawings requirements. Further, neither the F&M/CE QC nor the EIT performed final inspections of reworked items.

The IE:III inspector verified and determined that conduit supports were in accordance with specified drawings. During verification, the inspector determined that data sheets for EIRs 5053 and 5059 contained typographical errors. The errors were acknowledged and corrected.

During discussions with F&M/CE personnel, the EIT lead representative, the licensee's representative and the conduit hanger team leader, it was acknowledged that the contractor should document the rework performed and conduct necessary inspections.

(3) Unresolved Item

The inspector noted an apparent lack of adequate information (records) to demonstrate that rework and inspections were complete. The licensee representative and the F&M/CE personnel explained that they would develop and implement a system to document rework performed, including any additional material used, on the data sheets. The inspections by the contractor QC and EIT may also be documented on the same data sheet prior to close out. This matter will be reviewed during a subsequent inspection.

(4) Drawings Modified to Reflect As-Built Installations

EIRs 5002, 5004, 5010, 5011, 5026, 5027, 5035, 5036, and 5052.

The discrepancies identified in the above EIRs can broadly be classified in three categories.

(a) Conduit support incorrectly tagged. The IE:III inspector verified and determined that Conduit 28419A in Room 208 was now identified with the correct tag.

(b) In cases where conduits were not routed as per drawings, appropriate drawings were revised. The IE:III inspector determined that this was accomplished.

(c) EIRs 5035 and 5036 identified that a 14" x 14" blockout was not shown on Drawing C241. These EIRs were reported closed out with GPD letter BT 6082. The revised Drawing C241 did not show the blockout. The GPD civil supervisor was consulted and he provided information that the blockout was identified on drawing C207 instead of C241.

(5) Unresolved Item

The IE:III inspector stated that information provided for the above mentioned EIR closeouts was insufficient to verify the corrective action taken. The IE:III inspector pointed out that licensee representatives have apparently not issued necessary instructions to document adequate information so as to permit verification that the item was closed out properly. Corrective action to be taken will be verified during a subsequent inspection.

(6) EIRs With Open NCRs Reported Closed

EIRs 5030, 5047, 5075, and 5076.

As a result of discrepancies identified in the above EIR's, Nonconformance Reports (NCR's) B257, B258, B261 and B-262 were generated by F&M/CE and forwarded to Bechtel GPD. Although the NCRs remained open pending resolution by GPD, the EIRs were reported closed. The IE:III inspector pointed out to the licensee that this method of closing EIRs was contrary to the requirements of Procedures EIP-008-5 and EIP-008-1.

(7) Unresolved Item

The IE:III inspector reviewed letter BCM No. FL 14-3672, dated April 6, 1976, which addresses itself to inspection of rework regarding EIR items 1 through 2543. F&M/CE stated that they did not receive a similar letter for reinspection relative to EIR items 5000 series. The inspector inquired whether such a separate letter exists and if not, whether letter FL 14-3672 should also encompass EIR items 5000 series. It appears that such a letter directed to F&M/CE informing them of the documentation on rework and QC inspections is necessary to control this quality affecting activity. The licensee representative stated that he would investigate and furnish the necessary information.

4. Review of Seismic Class I Field Fabrication Facilities (Adverse Environment Considerations)

a. Inspection Objectives

To ascertain whether F&M/CE is fabricating the various supports in the on-site fabricating facilities with approved drawings, approved materials, appropriately stored weld rod, and qualified welders.

b. Inspection Objectives Accomplished By

(1) Review of the drawings for approvals.

(2) Review of weldor qualification records.

(3) Review of "Welding Call Sheets" maintained at the weld shop.

(4) Verifying whether the shop weld was stamped with the stamps of the weldor (who performed the welding) and the welding inspector.

(5) Verifying storage of weld rod to the manufacturer's recommendations.

c. Inspection Findings

(1) Only weld rod type E6010 and E7018 were being used for all welding activities whether safety related or not.

(2) Weld rod type E6010 manufactured by Lincoln was stored in the shop in a heated box.

(3) Weld rod type E7018 manufactured by Chemtron was stored in an oven. At the time of the inspection, the dial thermometer was indicating 270°F. Weld rods were being issued to the field in portable ovens which are to be energized in the field. During the current inspection, the inspector observed that portable weld rod ovens were energized.

(4) Drawings used for fabricating supports were verified and contained necessary approvals.

(5) "Welding Call Sheets" were being used to document fit up inspections, weldor activities and welding inspections. However, it was observed that a correlation between this document and the fabricated support was not maintained because it was not a requirement. The inspector stated that without such a correlation tracking the welding activities on a given support is very difficult. The welding inspector acknowledged the advantage and stated that he would formulate such a correlation.

(6) The inspector reviewed weldor qualification records and determined that seven weldors were inadvertantly

recorded as being qualified to procedure QAP-6 instead of QAP-1. The F&M/CE welding inspector acknowledged the discrepancy as a typographical error and initiated an Inspection Report IR No. 0626 the same day requesting that records be corrected. The welding inspectors were qualified.

5. Verification of Inspections on Field Welds (Adverse Environment Considerations)

a. Inspection Objectives

To ascertain whether Conduit Supports No. CS 832-405-06 and No. CS 833-405-07 were installed according to requirements.

b. Inspection Objectives Accomplished By

(1) Visual inspection of supports in the Auxiliary Building, Area 8, Room 405, Elevation 603.

(2) Using documents: F&M/CE, Checklist IIP-7749-E14-7a-003, Revision 3, Page 7, Drawing E 302A, Sheet 168.

c. Inspection Findings

(1) Conduit supports were installed as per drawings.

(2) Identifications of the weldor and welding inspector were stamped adjacent to welds on Conduit Support CS-832-405-06-2.

(3) Records of the identified weldor verified that he was qualified.

6. Welding Inspections

a. Inspection Objectives

To ascertain whether welding inspections detected any discrepancies in welding activities.

b. Inspection Objectives Accomplished By

Review of nonconformance reports written on this subject.

c. Inspection Findings

The inspector reviewed the following Nonconformance Reports generated by F&M/CE and determined that welding inspections

were being performed, discrepancies were being identified and resolutions were being requested from appropriate personnel.

(1) NCR B-298, dated June 2, 1976, indicated that Conduit Support No. 9084 (P1000 unistrut) was welded to an I-beam without pre-heating the weld area. Bechtel Engineering was requested to provide disposition.

(2) NCR A-115, dated May 24, 1976, identified that a conduit support fabricated to Drawing E-302A, Sheet 257, was removed from the F&M/CE Weld Shop and installed without inspection and before the weldor and inspector stamped it. Disposition: Scrap.

(3) NCR A-114, dated May 19, 1976, identified that a conduit support was installed without evidence of weldor identification or inspection. Further, it was indicated that welds were reported painted over obscuring the identification. Disposition: Replace.

(4) NCR A-112, dated May 15, 1976, reported that a conduit support fabricated to Drawing 7645-313-SW was purchased. The support consisted of a unistrut P1001 with a plate welded to the end. The weld was covered with galvanizing. The report identified that the support did not meet Drawing E-302A and F&M/CE QC inspection requirements. Disposition: Replace.

(5) NCR A-111, dated May 15, 1976, identified two conduit hangers which were fabricated, welded and installed in the field without inspections. Corrective action suggested two alternatives: (a) to scrap the hangers or (b) to add corner brackets as per Drawing E-302, Sheet 189, Details.

(6) NCR A-110, dated May 15, 1976, identified a conduit support fabricated in the F&M/CE shop on May 16, 1976, without an approved drawing. The support had been installed in the annulus space on the outer channel of a walk way at approximately Elevation 600 (azimuth-265).

It was recommended that a hold tag be placed pending approval of the drawing. Personnel were instructed not to fabricate or install hangers without approved drawings by the Bechtel Resident Civil Engineer.

) NCR A-107, dated April 29, 1 6, identified four (4) conduit hangers which were fabricated in the F&H/CE shop without fit up inspections or being recorded on the "Welding Call Sheet". It was recommended that Construction personnel be instructed to follow approved procederes regarding fit-up inspection and "Welding Call Sheets." Scrapping of the four (4) conduit hangers was recommended.

Corrective action was reported to have been accomplished by instructing the construction personnel to follow approved procedures. Engineering concurred that there was no indication that the hangers were scrapped. Followup of this matter is planned.

7. Installation of Essential Electric Cable - Engineering Inspection Reports (EIRs)

a. The inspector reviewed representative EIRs and the associated documentation relative to their resolution. EIR review included:

(1) Violations of separation criteria in junction boxes and manholes;

(2) Installation of cable in overfilled risers and wireways;

(3) Improper cable routing;

(4) Installation of improper size cable; and

(5) Installation of vertical conduit runs without appropriate supports.

b. The required separation has not been maintained, nor have barriers been installed between 125 VDC supply cables in each of the essential DC distribution panels: D1N, D1P, D2N, and D2P. This appears to deviate from FSAR statements (Paragraphs 8.3.2.2.7 and 8.3.1.2.25). This matter remains unresolved pending further review of engineering evaluations.

c. With regard to essential DC distribution panels, the inspector noted what appeared to be a deviation from FSAR separation criteria, but which is actually a channel designation anomaly. Channel 1 and channel 2 DC motor control centers supply

125VDC through essential DC distribution panel D1N to the 125VDC/120VAC inverter YV3, labeled channel 3. Channel 2 supply is energized only for maintenance when shutdown. Thus channel 1 and channel 3 are actually a common line. A similar situation exists in D2N. For panels D1P and D2P, channel 1 and channel 2 supply inverters 1 and 2, and thus the apparent deviation does not exist. An engineering evaluation to establish a basis for acceptance of this apparent commonality of channels 1 and 3 (and 2 and 4 for Panel D2N) was not available. This matter is considered to be unresolved.

d. As a result of cable 1CBE1285D being pulled short of its destination, the cable is to be terminated in a nonexplosive proofbox (JT4616) in battery room 429B. Furthermore, conduits entering this box are not sealed. The licensee's position is that the battery room is not classified as a hazardous area.

The FSAR Section 8, Paragraph 8.1.5, (Item No. 3, page 8-3) states, in part that: "Revelant NEC reccmmendations are used as guides in the design." Section 9 of the FSAR on page 9-2, item No. q references the "NFPA standards." NEC is endorsed as NFPA 70-1975. The inspectors conclusion based on review of Chapter 5 of NEC (1975) is that the battery room should be classified as a hazardous area, Class I, Division II. The use of a nonexplosive proof box is permissible, however, conduit sealoffs are required. This is considered to be unresolved.

8. Installation of Essential Electric Cable and Containment Particulate Sampling

Scope of Inspection

Purpose of the inspection was to determine if the licensee had corrected previously reported nonconforming conditions regarding the installation and routing of essential cables.

The following items were inspected and are considered acceptable, except as noted:

Installation and routing of essential cables.

General housekeeping condition of cable trays and wire ways.

a. Cable Installation and Routing

The inspector audited the licersee's Engineering Inspection Report (EIR) documentation and analysis of recommended corrective action and implementation.

by direct observation the inspector reviewed installation, routing and corrective action implemented for selected essential cable runs as recorded by the EIR, cable pull card and electrical circuit schedule, Rev. 39 dated April 17, 1976.

The essential cables and associated pull card/circuit schedule selected for audit included the following:

Item No.	EIR	Cable No.	From	To	Pull Card Rev. No.
1.	-	2CVDH13AE	EV1469	C5717	R37
2.	-	1CV236B	EVMU33	C5717	33-C
3.	-	2CBF1126F	CDF11A-1	C5705	34-C
4.	-	2PBF1118A	BF11A	BF11E	21-C
5.	-	1PBE1216A	BE12A	C6706	32-C
6.	-	1CAFPT01B	CDE12A-1	C5709	37-C
7.	-	2CAD113F	AD113	AD108	31-C
8.	547	1CAFPT01C	CDE12A-1	C3630	37-C
9.	563	1CBE1147E	BE11D	CDE11D	34-C
10.	595	1CBE1223A	BE12A	CDE12A-2	37-C
11.	601	1CBE1160F	BE11E	CDYE2	F39-C
12.	620	2CBF1118F	BF11A	CDYF2	F32
13.	626	2CBF1207H	BF12A	C3630	32
14.	640	2CBF1106E	BF11A	CDF11A-2	34-C
15.	659	2CV1357E	RC3702	BF14	39-C
16.	666	2CSFC24H	V5021	JT2730	39-C
17.	673	1CBE1223C	CDE12A-2	C5705	37-C
18.	679	1CSFC11J	V1424	JT3810	F33
19.	702/703	1CBE1271G	CDE12B	C5717	R37

The inspector verified that nonconformances reported for items one thru eighteen above had been satisfactorily corrected.

Item 19 had not been corrected and is discussed in the following paragraph.

b. Corrective Action

The inspector noted that corrective action for the discrepancy noted in EIR 702 for item 19 had not been implemented as yet.

Separation between essertial and non-essential cable is not maintained. Essential cable 1CBE1271G is still in contact with non-essential cables ACX0203A, ACX201A, ACSANNF, ACSASA, ACSA5LTAV and BPBF2225A. The separation barrier recommended by GPD for installation where 12 inch separation could not be maintained, had not been installed.

In addition, a spare essential cable IPBSPARE04 had been pulled into manhole MH3005 and remains in contact with non-essential cables BPBF2225A and APBE2205A.

This is an observation and will be reviewed during subsequent inspections.

c. Cable Separation

While inspecting items 1, 2 and 19, the inspector observed that required separation between other essential cables (channels 1 and 2) and non-essential cables (channels A and B) was not maintained. Essential channel 1 cables located in the left side compartment of C5716 are in contact with non-essential cables ALNNI829 and BLNNI222. Essential channel 2 cables located in the right side compartment of C5716 are in contact with non-essential cables BLNNI221 and ALNNI828.

This is an infraction.

d. Identification/Tagging

Manholes MH3001, MH3004 and MH3005 through which safety related cables are routed are not physically identified or tagged. Instructions or other information regarding identification of these manholes was not available for review during the current inspection.

This item is considered unresolved pending further review by a subsequent inspection.

e. Cable Trays/Wire Ways

By direct observation, the inspector viewed the cable trays and wire ways and found them to be free of dirt, debris and sharp edges.

The essential cables routed through these trays/wire ways appeared to be free of insulation damage and short radius bends.

f. Process and Effluent Radiological Monitoring Systems

Section 11.4.2.1 of the licensee's Final Safety Analysis Report (FSAR) states that the sample system for each off-line monitor is designed to provide a representative sample to the respective detector.

during this inspection, the inspector noted that the sampling line to the safety related (Q-listed) containment vessel particulate monitors (No. 5029, 5030) contained numerous right angle bends and U-bends in the approximately 200 ft. from the particulate monitor to the sampling point at the top of the reactor secondary shield wall. This construction (numerous right angles and U-bends in the sample line) results in particulate plate-out and impaction, to preclude the possibility of the particulate reaching the detector. This matter is considered a deviation to FSAR commitments.

Further, FSAR section 11, Paragraph 11.4.2.1 states in part that ". . . where particulate activity levels are measured the system is designed for isokinetic sampling." However, Table 11-50 of the FSAR does not specify flow rates for the subject monitors and states that flow rates are "not applicable". These two requirements appear to be in conflict. Moreover the as-built (one inch line) above the reactor secondary shield wall does not include apparatus for isokinetic sampling. Followup review of this matter is planned.