

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/84-35

Docket No. 50-341

License No. CPPR-8

Licensee: Detroit Edison Company  
2000 Second Avenue  
Detroit, MI 48224

Facility Name: Enrico Fermi Nuclear Power Plant, Unit 2

Inspection At: Enrico Fermi 2 Site, Monroe, Michigan

Inspectors: *Amit S. Gautam for*  
K. R. Naidu

9/7/84

*Amit S. Gautam*  
A. Gautam

Date

9/7/84

*Amit S. Gautam for*  
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Date

9/7/84

Approved By: *C. C. Williams*  
C. C. Williams, Chief  
Plant Systems Section

Date

9/7/84

Date

Inspection Summary

Inspection on August 7-10, 1984 (Report No. 341/84-35(DRS))

Areas Inspected: Corrective action taken on 50.55(e) items and previous inspection items, open and unresolved items, electrical as-built configuration, observation of installed instrument cables and review of their records. The inspection involved 74 hours by three NRC inspectors.

Results: No items of noncompliance were identified in the areas inspected.

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## DETAILS

### 1. Persons Contacted

#### Detroit Edison Company (DECo)

S. H. Noetzel, Assistant Project Manager  
W. H. Jens, Vice President Nuclear Operations  
W. Miller, Supervisor, Quality Assurance  
E. P. Griffing, Nuclear, Assistant Manager  
J. P. Zoma, Principal Resident Engineer  
M. Ripley, Startup Director  
E. H. Songeroth, Nuclear Engineering  
R. S. Lenart, Superintendent - Nuclear Production  
T. S. Hickelson, Startup Engineer

#### General Electric Co.

T. L. Mintyn, Assistant to Startup Director

All of the above attended the exit meeting on August 10, 1984. In addition to the above persons, other licensee and contractor personnel were contacted during the inspection.

### 2. Licensee Action on 50.55(e) Items

- a. (CLOSED) 341/83-05-EE (Licensee Item No. 91) Failures of puffer piston rods in Brown Boveri Electric, Type 5HK 4160V Breakers. This item was initially reported as a 10 CFR 21 item and later confirmed as a problem by the NRC in IE Information Notice No. 83-84.

An evaluation was performed by the licensee to determine the cause of the plastic piston shaft cracking or breaking at the connecting pin holes. Letter EF2-67700 dated February 20, 1984, and attachment "Engineering Research Report 83 E64," dated July 16, 1984, reviewed cracks in piston rod pin holes as possible causes of failure. It was observed by this inspector that the testing and analysis performed by Detroit Edison's Engineering Research Department could not reach a definite conclusion as to the cause of shaft failure. It was, however, determined that "... the cracks are induced in the manufacturing process and do not in themselves indicate an imminent failure of the puffer piston assembly."

DECo's final resolution letter EF2-69274 dated July 24, 1984, reported all rods to be replaced with rods of stronger material. This was confirmed in the DECo Nonconformance Report 83-210, and the testing of these new rods reviewed in the DECo evaluation report discussed earlier (Ref. EF2-67700).

In addition to this, maintenance instruction MI-M041, Revision 1, Sections 6.4 and 6.6, now requires inspection of the new piston rods and checking of the operation of the puffers.

Based on these modifications, this item is closed.

- b. (CLOSED) 341/83-22-EE (Licensee Item 108): Discrepancies in the installation of wedge anchors for 4KV switchgear.

The inspector reviewed the following documents:

- . Design Change Notice No. 10287, Revision 0
- . Investigation of the adequacy of the original 4160V Switchgear Mounting Installation, Design Calculation (DC) No. 2618, Revision A
- . Nonconformance Report No. 83-1252
- . DECo final resolution letter EF2-69281 dated July 13, 1984

The licensee reported that this item was in fact not reportable under 10 CFR 50.55(e) based on design calculation DC 2618 demonstrating that the original installation would meet all design criteria. The inspector observed that DC 2618 assumed original wedge anchors to be set. Based on this assumption, DC 2618 demonstrated that in the event of seismic activity any movement of these anchors would not affect the safe operation of the plant.

The inspector also observed that NCR 1252 and DCN 10287 required additional wedge anchors to be installed on the RHR 4160V Switchgear in ESS I and II Switchgear rooms. DECo letter EF2-69281 confirmed installation of new wedge anchors for the affected switchgear.

Based on this review, this item is closed.

- c. (CLOSED) 341/83-08-EE (Licensee Item 94): Loose pole wedges found in (4) emergency diesel generators.

The following documents were reviewed for closure of this item:

- . Nonconformance Report 83-349 for EDG No. 14
- . Nonconformance Report 83-401 for EDG No. 12
- . Nonconformance Report 83-403 for EDG No. 11
- . Nonconformance Report 83-404 for EDG No. 13
- . PIS Number 430-01-S001, Revision 1, Preventive Maintenance tasks for EDG No. 11
- . Engineering Research Report 83D82-1 dated June 20, 1983, Vibration Analysis of No. 14 Emergency Diesel Generator

- . Maintenance instruction MI M042, Revision 1, Emergency Diesel Generator - Generator General Inspection
- . DECo final response letter No. 50-341 dated May 27, 1983
- . QCIR-G20-1408, Revision 2, QC inspection records for replacement of wedges

The licensee has corrected this problem by replacing the loose wedges in the field with wedges of harder material. The inspector reviewed the new wedges in the field and found no discrepancies. Installation inspection was reviewed on QCIR-G20-1408, Revision 2. Details of an overspeed trip test performed on each EDG was reviewed on Vibration Analysis Report 83D82-1 to confirm adequacy of the new wedges.

It was confirmed that a new six month cycle preventive maintenance program was added to maintenance instruction MI-M042, Paragraph 6.2.4.3, via Temporary Change Log No. T089.

Referenced NCRs 349, 401, and 403 confirmed completion of work. Based on this review, this item is closed.

### 3. Action on Previous Inspection Findings

- a. (CLOSED) Noncompliance (341/83-07-01(DRS)): Failure to take adequate followup action, including re-audit and/or significant surveillance of deficient areas within the design change distribution program to determine the effectiveness of that program.
  - (1) The inspector reviewed corrective action Procedure 1601 dated March 21, 1984, which establishes a method for the evaluation of audit and surveillance findings for significance, and the evaluation for effectiveness of the corrective action taken to prevent their recurrence.
  - (2) DECo to NRC letter EF2-65283 dated September 21, 1983, provides a summary description of measures taken by DECo to assure that the as-built configuration of plant systems and components meets the requirements of the design and construction documents. They include design change control.
  - (3) The inspector reviewed the results of Construction Quality Assurance (CQA) Design Change Document Control Surveillance for the period of September 19 to October 18, 1983. CQA on a weekly basis randomly selected areas of the plant and reviewed design documents (drawings, change paper, Specs, and Procedures). This review was the corrective action program designed to verify site wide implementation of the Design Change Document Control requirements. 138 total documents were reviewed by the licensee during this surveillance, of the above documents reviewed, nine (9) deficient conditions were identified in QA level II and III work packages, each of the conditions identified were corrected during the surveillance.

No QA level I documents were found to exhibit any problems. The CQ will perform routine surveillance on a monthly basis in those areas where construction activities are being accomplished.

(4) The inspector reviewed the following Document Design Control and Record Management Audits:

(a) Audit A-OA-C-83-20 dated September 6-13, 1983.

(b) Audit A-OA-C-83-25 dated October 17-25, 1983.

(c) Audit A-OA-C-84-11 dated March 26-30, 1984.

(d) Audit A-QS-P-84-25 in progress.

It appears to the inspector that the licensee has implemented an active surveillance and corrective action program.

b. (CLOSED) Noncompliance (341/83-07-05(DRS)): The licensee's document control measure failed to provide for incorporating design changes into controlled documents used in the performance of preoperational testing.

(1) Corrective action taken by licensee:

(a) The startup test engineer is responsible for reviewing change documents to assess their impact and assure incorporation into the preoperational test which is documented in Startup Instruction 8.1.0.01 (Testing Progress Checklist, Revision 10) dated April 23, 1984.

(b) The responsibility for reviewing System Operating Procedure (SOP) lies with the Nuclear Operations Department. The inspector reviewed Procedure 12.000.07, Revision 9 dated March 9, 1984, which defines Nuclear Operations responsibilities during operational testing. Startup Instruction 4.7.1.02, Revision 1, dated December 29, 1983, which is a design change document review within startup intended to ensure proper processing of design change documents such as (DCR, DCN, FMR, As-Builts, and DCP.).

(2) The inspector reviewed Design Control Activities Audit A-OA-C-84-15 dated April 18-19, 1984, performed to determine the degree in which Startup has documented and implemented their duties and responsibilities with respect to design control activities. Results indicated that responsibilities as established in the scope listed documents are being satisfactorily implemented.

c. (CLOSED) Unresolved Item (341/82-20-02(DRS)): Discrepancies exist between the FSAR commitments and as found conditions of the Standby Liquid Control System's electrical components and equipment.

(1) The inspector reviewed licensee's commitments documented in DECo to NRR letter dated June 22, 1984, which indicated the corrective action taken to address the SLCS discrepancies. The licensee performed the following:

- (a) QA/QC audit of the 110 SLCS cables.
- (b) All 110 cables have been high voltage tested and found satisfactory.
- (c) A review of common fault and interactions of cables routed from MCC 72B-4C and MCC 72E-5B has been completed and found acceptable.
- (d) Design and construction documentation review and system walkdown to verify as-built condition was performed and found satisfactory.
- (e) SLCS components have been added to the EF2 - Project Q list, and are classified as IM to indicate equipment which will be treated as safety related henceforth.
- (f) A proposed revision to the Fermi 2 Technical Specification for surveillance of electrical isolation devices associated with the SLCS.

The inspector's review of the corrective action taken by the licensee indicated that the action taken appears to be adequate.

- d. (OPEN) Open Item (341/81-12-02) Separation of Balance of Plant (BOP) and divisional cables in common raceways. This item identified BOP cable from both redundant divisional raceways entering into a common BOP raceway. Documentation provided evidence of fire proofing material being placed over the BOP cables crossing from divisional raceways to the BOP raceway. However, it could not be verified if the cables in question had protective devices to prevent loss of circuits due to shorting in trays, as required by DECo Design Instruction 112, Figure V-1.

Pending further review this item remains open.

- e. (CLOSED) Unresolved item (341/84-17-05): Inadequate test reports for equipment qualification of ITE/GOULD Motor Control Centers.

The licensee reported that due to a lack of adequate review by the licensee at time of procurement, inadequate test reports had been accepted from Gould for procured motor control centers.

In response to this NRC concern, the licensee visited the supplier on June 21, 1984, as reported on DECo letter Reference QA-84-1584, and retrieved additional procedures and records. The inspector reviewed Gould QA Test Requirement Sheet IE90235 and Gould Test

Procedures QAP11.3, Revision 3, and QAP11.2, Revision 3, retrieved from the supplier to establish Class 1E qualification of the MCCs. In addition to this, the inspector reviewed equipment testing done on site for MCC 72B-2A as recorded on C&IO Test Form TF.000.126.01, Revision 1, S/U System R1604, PIS No. R1600-S002A.

Based on this review, this item is considered closed.

#### Functional Activities Inspected

#### 4. Review of As-Built Configuration of Selected MCC's

- a. The inspector selected a sample of two safety-related electrical 480V Motor Control Center components to assess conformance of their installation to the final design drawings. Attributes reviewed included nameplate identification, fuse sizes, overload element ratings, starter sizes, power cable sizes, and cleanliness.

The following MCC's were reviewed:

(1) MCC 72C-3A (Front Elevation drawing 5SD721-2512-18)

- (a) Compartments 2B, 3B, 8C, and 8D contained nameplates indicating that they were being used for RHR(E11) motor operated valves. However, the drawing indicated that the above compartments are spare.
- (b) Compartment 2D contained a blank nameplate, the drawing indicated a spare compartment.
- (c) Compartments 6B and 6D contained cardboard paper shorting two electrical terminations.
- (d) Compartment 10E was very dusty.
- (e) Compartment 3A contained thermal overload element G30T49B, while the drawing specified element G36T51.
- (f) Compartment 3C contained thermal overload G30T49B, while the drawing specified G30T45A. The licensee indicated that FMR S-7371 dated July 5, 1984, requested the change.

(2) MCC 72F-4A (Front Elevation drawing 5SD721-2512-19A)

- (a) Compartments 4A, 5C, and 5D contained nameplates indicating that they were being used for RHR(E11) motor operated valves; however, the drawing specified the above compartments as spare.
- (b) Compartments 1C and 1D contained blank nameplates, while the drawing specified spare compartments.

- (c) Compartments 4C (E21 50F005B-Core Spray Inboard Valve "B") contained 30A fuses for valve motor protection, while the drawing specified 25A fuses.
- (d) Compartment 5B contained thermal overload element G3014, while the drawing specified G3017. Temporary mod. Tag 16179 dated May 30, 1984, requested the above change.

Pending further review and additional information from the licensee item 4.a.(1)(a) through (f) and 4.a.(2)(a) through (d) remain unresolved (341/84-35-01(DRS)).

5. Observation of Instrumentation Cables

The inspector observed the work performance on completed work for the cables identified in Table 1 and determined the following:

- a. The cables were identified.
- b. The type and size of the cable was as specified.
- c. The termination components were as specified.
- d. Location, routing, protection, and separation were as specified.
- e. Raceway identification met the specified requirements.
- f. The connectors on the radiation detectors in the Steam Tunnel were identified as nonconforming. Review of the Nonconformance Reports (NCRs) indicated defective cable termination to the connector. Appropriate corrective action was recommended.

No items of noncompliance or deviations were identified.

6. Review of Instrumentation Cable and Termination Records

a. General

The inspector reviewed the documentation associated with the cables identified in Table 1. A cable Pull Card was generated for each cable pulled and provided various data including a Cable and Reel Record Card (CRRC). The CRRC provides the warehouse inventory number, which in turn provides the details of the Receipt Inspection Records (RIR). The RIRs are stored in the QA vault and provide traceability to the manufacturer's test reports. The inspector reviewed the relevant records for each cable listed in Table 1 as discussed in the following paragraphs.

- b. The Cable Pull Card (DE Form SP166-72X) provided the following information:
  - (1) Cable identification.
  - (2) Type of Cable.



- (3) Raceway routing.
  - (4) References drawings to terminate the ends of the cable.
  - (5) Furnishes the lengths of the cable.
  - (6) Manufacturer's reel number.
  - (7) The Foreman whose crew completed the cable pull and terminated the cables including the dates.
  - (8) The QC inspector(s) who verified the above activities.
  - (9) Any subsequent rework including determination pull out and reterminations.
- c. The records of all the cables reviewed with the exception of Cables 231.567-F2 and 231566-F2 were observed to be acceptable. The termination records for these two cables contained the remark, "connector installed and bagged; not torqued." DECo Specification 307-33, Revision T, pages 304 and 305 gives details on the installation of co-axial connector UG-932/U and UG-961/U (Amphenol 28 225). Paragraph 5.2.11 specifies the following: " Carefully slide the prepared cable termination into the connector body. Using open end wrenches only, tighten the gland nut while holding the connector body stationary. Tighten the gland nut beyond "finger tight" to a point sufficient to maintain the integrity of the connector and to securely grip the cable jacket without damaging the cable on the connector parts." The NRC inspector contacted the QC inspector who wrote the remarks and questioned his documented remarks. The QC inspector stated that he wrote it for information. The amphenol connector should not be torqued. The NRC inspector plans no further follow up on this matter.
- d. RIR 5-28-80-2 indicated that 18 reels of 5/C #12 Blue Jacket color type cable were received from Okonite Cable, Passaic, New Jersey (Okonite) without apparent shipping damage on May 29, 1980. The following documents were included in the QA records:
- (1) Certificate of Conformance that the materials used were duly tested during manufacture and that the materials meet or exceed the applicable requirements.
  - (2) Inspection Sheet for wires and cables indicated that the insulation resistance, conductor size, DC resistance, and cable OD were checked. The cable successfully withstood 4KV AC voltage for 5 minutes and 9KV DC for 10 minutes.
  - (3) Physical Test Report contained the results of tests including tensile strength after various aging processes.
  - (4) Certificate that the insulating compound met the requirements of the water absorption tests.

- e. RIR 2-8-82-2 indicated that various quantities of cable including 5/C #12 orange jacket color were received from Okonite without apparent shipping damage on March 5, 1982. The following documents were included in the QA records:
- (1) Certificate of Conformance that the materials used were duly tested during the manufacture and that the materials meet or exceed the applicable requirements.
  - (2) Inspection sheet for wires and cables indicated that the insulation resistance, conductor size, and cable OD were checked.
  - (3) Physical Test Report contained the results of tests including tensile strengths after various aging processes.
  - (4) Certificate that the insulating compound met the requirements of the absorption tests.
- f. RIR 7-2-80-3 indicates that several quantities of cable including 5/C 12-7 TC 030 Okonite cable with blue jacket were received without any apparent shipping damage on July 7, 1980. The following documents were included in the QA Records:
- (1) Certificate of Conformance that the materials used were duly tested during the manufacture and that the materials meet or exceed the applicable requirements.
  - (2) Inspection sheet for wires and cables indicated that the insulation resistance, conductor size, cables and cable OD wire were checked.
  - (3) Physical Test Report contained the results of tests including tensile strengths after various aging processes.
  - (4) Certificates that the insulating compound met the requirements of the absorption tests.
- g. Receipt Inspection Report (RIR) 4-19-79-3 indicated that several reels of cables including 1/C #22 Single Shielded co-axial cable with Magneta colored jacket were received without any apparent shipping damage from Rockbestos Company, New Haven, Connecticut (Rockbestos). The following information was included in the records:
- (1) Certified Test Reports (CTR) from Rockbestos indicated that the cable withstood the 5.0KV dielectric test for one minute and passed the continuity checks.
  - (2) The minimum wall thicknesses of the insulation and jacket were within the specified requirements.
  - (3) The physical non-destructive tests performed on the cable met the specified requirements relative to insulation resistance, capacitance, velocity, and impedance.
  - (4) The destructive tests included corona extinction and flame tests.

- h. RIR 11-4 81-1 indicated that several reels of cables including 2/C #16 size shielded cable were received at Fermi without any apparent shipping damage from Rockbestos Cable Company. CIRs included in the records indicated the following:
- (1) The maximum outside diameter of the cable was not exceeded.
  - (2) The cable successfully withstood 2.5KV dielectric test for 5 minutes.
  - (3) Insulation resistance met the specified requirements.
  - (4) Conductor resistance was less than the maximum.
  - (5) The minimum wall thicknesses of the insulation and jacket met the specified requirements.
  - (6) The test results relative to tensile strengths, elongation tests and heat distortion indicated acceptable values for the conductors and the jacket.
  - (7) The fire retardation characteristic met the IEEE 383 requirements.
- i. RIR 856-33V dated January 31, 1974, indicated that several reels of 22 AWG co-axial cables were received without any shipping damage from Roychem Corporation, Menlo Park, California. The following information was included in the QA records:
- (1) In-process Wire, Cable and Co-axial Cable Test Reports indicated that the physical, flame-retardant and electrical characteristics met the applicable requirements.
  - (3) Physical characteristics verified included diameter, tensile strength and wall thickness.
  - (4) Electrical characteristics verified included dielectric strength (7KV for one minute) capacitance and corona.
- j. The inspector requested the licensee to contact the Rockbestos Cable Company and Okonite Company and obtain information on the following matters:
- (1) RIR 4-19-79-3 contains Rockbestos Cable Test Reports which indicate that the minimum and maximum insulation thickness was 0.113. Some of the measured values were less than 0.113. Also the minimum insulation thickness was specified as 0.242 and the measured value was 0.239.
  - (2) The Air Pressure Heat Aging test was not performed for cables supplied with RIR 7-2-80-3.

The licensee agreed to evaluate the impact of these matters on safety. This matter is considered unresolved (341/84-35-02).

TABLE 1

Identification	C A B L E		D E S T I N A T I O N	
	Size	Type	From	To
254 273-2K	# 16	2/C Shielded Twisted	ECCS TU Cabinet	Differential Pressure Transmitter (DPT) B31-N115A located on Recirc Pump A rack H21-P006
231 566-F2	# 22	Single Shield 62 ohm coaxial	Log Radiation Monitor Plug (LRMP) J1 on Panel H11-P606	Main Steam line detector (MSLD) D11-N006D(c)
231 567-F2	# 22	- Do -	LRMPJ4 on panel H11-P606	MSLD D11-N006D (HV)
231 562-F2	# 22	- Do -	LRMPJ1 on panel H11-P606	MSLD D11-N006C (C)
231 563-F2	# 2	- Do -	LRMPJ3 on panel H11-P606	MSLD D11-N006C (HV)
246 735-1C	12AWG	5/C	Process Instrument Cabinet H11-P613	Alternate Rod Insertion (ARI) Scram Solenoid Valve (CV) C11-F160A
246 736-1C	12AWG	5/C	-Do-	ARI SV C11-F162A
246 737-1C	12AWG	5/C	-Do-	ARI SV C11-F162C
246 738-1C	12AWG	5/C	-Do-	ARI SV C11-F163A
246 740-2C	12AWG	5/C	-Do-	ARI SV C11-F162B
246 741-2C	12AWG	5/C	-Do-	ARI SV C11-F162D
246 742-2C	12AWG	5/C	-Do-	ARI SV C11-F163D
246 739-2C	12AWG	5/C	-Do-	ARI SV C11-F160B

TABLE 1 (Continued)

Identification	C A B L E		D E S T I N A T I O N	
	Size	Type	From	To
245 828-B1	# 20	5 Twisted Pairs	Reactor Protection System (RPS) B Trip Unit (TU) H21-P086	Differential Pressure Transmitters (DPT) B21-N086A, 88B and 89B located on Main Steam Line Flow Detection rack #21-P015
245 879-1K	# 16	2/C	ECCS TU #21 - P080	DPT B31-N113A located on Recirc Pump A rack H21-P006

7. Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during this inspection are discussed in Paragraphs 4 and 6.j.

8. Exit Interview

The inspectors met with the licensee representatives (denoted in Persons Contacted) at the conclusion of the inspection on August 10, 1984. The inspectors summarized the purpose and findings of the inspection, which were acknowledged by the licensee.