

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/84-29(DRS)

Docket No. 50-341

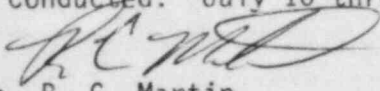
License No. CPPR-87

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, MI

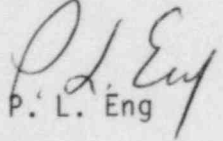
Inspection Conducted: July 16 through August 17, 1984

Inspectors: 
R. C. Martin

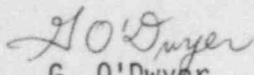
8/29/84
Date


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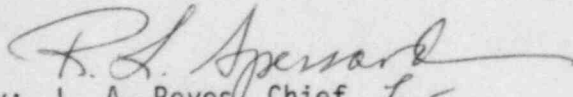
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P. L. Eng

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G. O'Dwyer

8/29/84
Date

Approved By: 
L. A. Reyes, Chief for
Test Programs Section

8/29/84
Date

Inspection Summary

Inspection on July 16 through August 17, 1984 (Report No. 50-341/84-29(DRS))

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, preoperational test procedure review, preoperational test procedure verification, preoperational test witnessing, preoperational test results review, preoperational test results verification, preoperational test program implementation, plant cleanliness, and inservice testing. The inspection involved a total of 198 inspector-hours onsite by four NRC inspectors, including 58 inspector-hours onsite during off-shifts. In addition, the inspection involved 99 inspector-hours in the Regional Office.

Results: Of the nine areas inspected, no items of noncompliance or deviations were identified in seven areas. Within the remaining areas, two items of noncompliance were identified (failure to follow procedures - Paragraph 5 and Paragraph 8).

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DETAILS

1. Persons Contacted

- *W. H. Jens, Vice President, Nuclear Operations
- *R. S. Lenart, Superintendent, Nuclear Production
- *G. R. Overbeck, Assistant Superintendent, Nuclear Production
- *T. S. Nicholson, Startup Engineer
- *M. Ripley, Startup Director
- *T. L. Mintun, Assistant to the Startup Director
- *T. S. Snead, LSTE-NSSS
- *D. Brooke, LSTE-Electrical
- *C. R. Gelletly, Supervising Engineer, Startup Engineering Assistance
- *G. Carter, Senior Engineer-Maintenance, Nuclear Production
- *J. Leman, Maintenance Engineer, Nuclear Production
- *B. Mordecai, Senior Engineer, Operations Assurance
- *M. Haver, Startup Assurance Engineer
- *R. Kezenius, System Engineer, Nuclear Engineering
- *F. Mulcahy, System Engineer, Nuclear Engineering
- *L. P. Bregni, Licensing Engineer

The inspector also interviewed other licensee personnel, including members of the startup, quality assurance and operating staff.

*Denotes personnel attending exit interview on August 16, 1984.

2. Action on Previous Inspection Findings

(Open) Unresolved Item (341/84-11-03(DRS)): Review of Design Change Notice (DCN) and Engineering Evaluations for motor operated valve stroke times. The inspector reviewed the licensee's actions in identifying, evaluating, dispositioning and implementing changes to design in this area and found the administrative processing to be in conformance with the requirements of Startup manual and QA manual. However, due to the scope of the DCN and its impact upon commitments in the FSAR, proposed Technical Specifications and design specifications this item will remain open pending NRC review and disposition of the changes.

(Open) Open Item (341/83-21-01(DE)): Excessive cavitation of Residual Heat Removal (RHR) pump. The licensee identified the cause of the cavitation as being due to excessive vibration and pump shaft whirl of all four RHR pumps. The licensee modified the pump hydrostatic bearings and discharge piping. This item will remain open pending review of results of RHR pump retests. Additional inspection findings related to RHR pump vibration are include in Paragraph 10 of this inspection report.

3. Preoperational Test Procedure Review

The inspector reviewed the following test procedures for compliance with the FSAR, the SER, Regulatory Guide 1.68, the QA Manual, and the Startup Manual and found them satisfactory.

PRET. R1102.001 ESF Auxiliary Electrical System
PRET. R3000.003 Emergency Diesel Generators Load Profile Test and
Load Sequencing
PRET. E4100.001 High Pressure Coolant Injection
PRET. P4400.001 Emergency Equipment Cooling Water

Portions of B2100.001 Nuclear Boiler System and A8100.001 ECCS Integrated Test were reviewed during this inspection period. These reviews will be completed during subsequent inspections.

No items of noncompliance or deviations were identified.

4. Preoperational Test Procedure Verification

The inspector verified that the preoperational test procedure, PRET. W2500.001 Circulating Water Reservoir and Decant System was written, reviewed and approved in accordance with the requirements of the FSAR, the SER, Regulatory Guide 1.68, the QA Manual and the Startup Manual and found it satisfactory.

No items of noncompliance or deviations were identified.

5. Preoperational Test Witnessing

The inspector witnessed the following preoperational testing to ascertain through observation and record review that testing was conducted in accordance with approved procedures. Additionally, the performance of licensee personnel was evaluated during testing and was found satisfactory unless otherwise noted:

a. PRET R3000.003 Emergency Diesel Generators Load Profile Test and Load Sequencing

The inspector witnessed, for Division I, the Loss of Offsite Power Tests, the ECCS Start and Load Rejection Tests and the ECCS Start with Loss of Offsite Power Tests, Sections 6.1, 6.3 and 6.4 respectively. Operations Surveillance Tests were incorporated as an integral part of this preoperational procedure.

Section 6.3 requires that as an initial condition, strip chart recorders be connected at local panels to monitor the voltage and frequency of the diesel generators during the start sequence. However, the electrical leads from the local panel of diesel generator 11 were not properly connected to the strip chart recorder. This is an item of noncompliance (341/84-29-01(DRS)) in failure to follow procedures caused by a personnel error.

In addition, section 6.4 requires that test personnel "hand operate" knife switches to simulate loss of voltage conditions and then immediately reclose these knife switches after the breakers trip. However, test personnel did not immediately reclose all the knife switches as required by the procedure causing the automatic

sequencing of emergency loads, including the "C" Core Spray Pump, to be delayed. This is an additional example of noncompliance (341/84-29-01(DRS)), failure to follow procedure caused by personnel error.

The inspector also informed the licensee of the following inspector observations:

- (1) Preoperational test data was not entered on to required data sheets in a timely manner. Run time information for the EDGs, although eventually logged correctly, was not recorded until approximately 90 minutes after the fact.
- (2) During the course of the test unexpected automatic pump starts occurred. Licensee evaluation of the event disclosed that action by test personnel prior to the start of the test established the conditions causing these pump starts during the test. Lack of awareness of system status and operating characteristics appear to be the root cause of this event.
- (3) During an electrical lineup a fuse was found missing from its breaker compartment with no explanation as to why and when it was removed or where it was taken.

These items are a concern to the inspector in that accurate records and control of activities are essential during this period of integrated plant testing to provide reasonable assurance that structures, systems and components are performing satisfactorily.

b. PRET E4100.001 High Pressure Coolant Injection (HPCI) System

The inspector witnessed the verification of HPCI valve operation during low dc voltage conditions.

c. PRET N6200.001 Off Gas System

The inspector witnessed the system startup and operation, alarm function, and logic verification.

d. PRET E1100.001 Residual Heat Removal (RHR) System

The inspector witnessed single pump run (RHR Pump D) with Torus to Torus flow, two pump run with Divisions 1 and 2 pumps, and three pump injection into the vessel. The inspector observed that the precautions for vessel injection were satisfied prior to commencing the test.

During the single pump operation, the inspector observed the collection of vibration data to verify the resolution of pump cavitation and vibration documented in inspection report 50-341/83-21. This is further discussed in Paragraph 10 of this report.

e. PRET R1102.001 ESF Electrical System

The inspector witnessed the Divisions 1 and 2 ECCS start logic and load reject test, and Division 1 EDG load sequencer logic verifications. During the load sequencer logic verification, the following was identified as an additional example of a noncompliance (341/84-29-01(DRS)).

Section 6.14 of PRET R1102.001 required that the load shedding trip cutoff switches are to be open for all breakers except 72EA-2C as initial testing conditions. However, the startup engineer failed to follow the procedure and positioned 72EA-2C to open and all others were closed. The error was not detected until the actual performance of the logic test when the 72EA-2C breaker failed to trip and the 72EA-2D breaker inadvertently tripped. This is considered a failure to follow procedures.

No other items of noncompliance or deviations were identified.

6. Preoperational Test Results Review

The inspector has partially completed the reviews of test results of the following preoperational tests:

PRET C3202.001 Feedwater Control
PRET C1108.001 Rod Worth Minimizer

These reviews will be completed in subsequent inspections.

No items of noncompliance or deviations were identified.

7. Preoperational Test Results Verification

The inspector verified that the results of the following preoperational tests were reviewed, approved and accepted in accordance with the requirements of the Startup Manual. In addition it was verified that the acceptance criteria met the commitments of the FSAR and the SER. The results were found to be satisfactory.

PRET D3000.001 Plant Seismic Monitor System
PRET W2500.001 Circulating Water Reservoir and Decant System

No items of noncompliance or deviations were identified.

8. Preoperational Test Program Implementation

a. Technical Review of Test Result Packages

As directed by Startup Group letter SU-84-1312 dated August 13, 1984 the Technical Review Committee (TRC) will adopt the use of subcommittees to review test result packages starting the week of August 20, 1984. Designated personnel from the required organizations representative of the TRC members would be assembled in a central location, with no concurrent duties, while performing test

result reviews. Upon completion of the review the subcommittee will present its recommendation to the TRC during a scheduled Test Result Review Meeting. This is perceived to be an improvement to the Fermi 2 startup program.

b. Maintenance

The inspector reviewed the following two maintenance and surveillance procedures, two maintenance work packages and two maintenance instructions and found them satisfactory unless otherwise noted:

POM 34.00.14 Emergency Diesel Generator (EDG) Inspection Procedure
POM 34.00.43T Reactor Building Crane Interim Inspection Procedure
MI-M005 Maintenance Instruction - Valve Packing Replacement
MI-M056 Maintenance Instruction - Gate Valve Maintenance
Maintenance Order 989184 Work Repair Package for RHR Valve E11-F008
Maintenance Order P-002154 Preventive Maintenance Package for EDG
Lube Oil Filters

- (1) Maintenance Order P002154 was released to perform safety-related preventive maintenance of EDG 14 Lube Oil Filters. During the performance of the maintenance it was determined that the Lube Oil Filter cover was warped and required corrective maintenance.

The inspector reviewed the maintenance order and attachments, and noted that the following was not in conformance with 10 CFR 50, Appendix B and ANSI N18.7-1976:

The maintenance order failed to reference any procedure for the required instructions but had stated that the maintenance was to be performed as craft capability with an attached handwritten work sequence. The work sequence removed the cover and filters, cleaned the strainers and filters, and replaced the cover with usage of standard tools.

The handwritten work sequence differs significantly from the On Station Review Organization (OSRO) approved procedure POM 34.00.14 EDG inspection procedure, which provides the following instructions, requirements and cautions:

- | | |
|-----------------|---|
| Step 6.15.1.3: | Remove cover. Do not set cover down on O-ring sealing surface. |
| Step 6.15.1.7: | Inspect interior of shell for loose or broken parts. Clean any dirt and debris from interior of shell. |
| Step 6.15.1.10: | Replace pressure plate and bolts. Tighten bolts until pressure plate makes contact with top of tie rod. When pressure plate is properly installed there should be approximately two and one half inches between the top of the elements and the bottom of the pressure plate. |

Caution: Do not rotate cover on O-ring, align cover lugs before cover contacts O-ring.

Step 6.15.1.12: Torque cover nuts 70-80 ft. lbs.

These requirements and instructions are not craft capability in that it is not within craft's knowledge to torque the cover nuts 70 to 80 foot pounds or that the pressure plate installation should have approximately two and one half inches between the top of the element and the bottom of the plate without instructions. In addition, the maintenance order did not require the use of torque wrenches or identify required torque valves. Therefore, the documented evidence such as, torque wrenches serial numbers or calibration due dates, along with recorded torque values are not included with the completed maintenance order. This is an item of noncompliance (341/84-29-02(DRS)) in that 10 CFR 50, Appendix B, Criterion V and ANSI N18.7-1976 require that activities affecting quality, such as preventative maintenance on safety-related equipment, shall be prescribed by documented instructions and procedures of a type appropriate to the circumstances and shall be accomplished in accordance with them.

Additionally, during the review of the maintenance order (PN-21 number 969503) and attachments for corrective maintenance on an ASME Section XI Class 1 valve (E11-FG08), the inspector noted that the work sequence referenced OSRO approved maintenance instructions to disassemble the gate valve and repack the valve with pure graphite type packing. However, electrical disconnection and removal of the limit torque motor operator was performed by a handwritten instruction. This is an additional example of the noncompliance (341/84-29-02(DRS)), failure to use appropriate procedures or instructions.

- (2) During the review of MI-M056, maintenance instruction to disassemble gate-type valves, the inspector noted that the torque values listed in Sections 6.2.2.3.f and 6.2.4.3.d do not agree with values for standard SAE Grade bolts. Additionally, the procedure does not identify the type of bolts and therefore it is not conclusive that the torque values specified are appropriate. This is considered to be an open inspection item (341/84-29-03(DRS)) until the licensee identifies the type of bolts and determines the torque values.

No other items of noncompliance or deviations were identified.

9. Plant Cleanliness

During recent operation of the temporary head spray system, a plastic bag was discovered in the Reactor Pressure Vessel (RPV) by the licensee. An inspection of the vessel prior to head spray operation had not revealed any debris. Previous occurrences of foreign material intrusions are documented in inspection reports as unresolved item 341/83-22-04(DE), noncompliances 341/83-25-04(DE) and 341/83-28-04(DE), and an outstanding 50.55(e) report.

The licensee was unable to determine the source of the foreign material intrusion or to disposition the occurrence prior to the completion of the inspection. This is an unresolved item (341/84-29-04(DRS)) pending determination and resolution of the source of foreign material in the RPV.

No items of noncompliance or deviations were identified.

10. Inservice Testing

The inspector reviewed the surveillance tracking system used for insuring the timely performance of the inservice testing of pumps and valves as required by Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. The licensee stated that prior to performing reference value setting tests for the inservice testing program for pumps and valves, "shakedown" tests will be performed. The inspector reminded the licensee that prior to entry into a given operational mode all surveillance testing required for that mode must be completed and that this includes results evaluation and approval. The licensee also stated that experience gained from the preoperational test program is factored into the inservice test procedures.

The inspector witnessed vibration data collection during the RHR preoperational test and had the following comments.

- a. The points where vibration data were taken were not explicitly and consistently marked on the pump. It is not clear that data will accurately indicate pump degradation or improvement if the same points are not used. The licensee has agreed to indicate explicitly the locations for vibration measurement on the pumps. Establishing definite points to be used for obtaining vibration data which are consistent with those used for obtaining vibration signature data during the preoperational tests will be tracked as an open item (341/84-29-05(DRS)).
- b. During test performance, the transducer used to obtain unfiltered vibration data was inadvertently dropped approximately five feet. Results of the post test calibration of all the transducers used during this test will be tracked as an unresolved item (341/84-29-06(DRS)).

No items of noncompliance or deviations were identified.

11. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 8.b and 10.a.

12. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 9 and 10.b.

13. Exit Meeting

The inspector met with site representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 16, 1984. The inspector summarized the scope and findings of the inspection.