

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/85025(DRS)

Docket No. 50-341

License No. NPF-33

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

Facility Name: Fermi Nuclear Power Plant, Unit 2

Inspection At: Fermi 2 Site, Monroe, Michigan

Inspection Conducted: May 20-23, and June 11, 1985

Inspectors: *J. Holmes for*  
J. Holmes

7/11/85  
Date

*J. Ulie for*  
J. Ulie

7/11/85  
Date

*F. Maura*  
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7/11/85  
Date

Approved By: *W. G. Guldemon*  
W. G. Guldemon, Chief *for*  
Operational Programs Section

7/11/85  
Date

Inspection Summary

Inspection on May 20-23, and June 11, 1985 (Report No. 50-341/85025(DRS))

Areas Inspected: Special, announced inspection by Region III based inspectors of the licensee's actions on previous violations and open items. The inspection involved sixty-four inspector-hours by three NRC inspectors, including 32 inspector-hours performing in-office review.

Results: No violations or deviations were identified.

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## DETAILS

### 1. Persons Contacted

#### Detroit Edison Company

- +\*J. Conen, Licensing Engineer
- \*E. Griffing, Assistant Manager, Nuclear Operations
- \*D. Holland, Nuclear Fire Protection Specialist
- + R. Lenart, Superintendent, Nuclear Production
- + W. Miller, Construction Quality Assurance Supervisor
- J. Rotondo, Senior Quality Specialist
- +\*R. Olson, System Engineer
- \*F. Svetkovich, System Engineer
- B. Wickman, Supervisor, Maintenance Modifications QA
- \*S. Williams, System Engineer

#### Gilbert Commonwealth

- \*G. Wilson, Fire Protection Engineer

#### USNRC

- \*C. Jones, Resident Inspector
- +P. Byron, Senior Resident Inspector

\*Denotes persons attending the exit meeting of May 23, 1985.

+Denotes persons attending the exit meeting of June 11, 1985.

The inspectors also contacted other licensee personnel including members of the operations, quality assurance, and engineering departments.

### 2. Action on Previous Inspection Findings

- a. (Closed) IE Circular 78-18: This circular identified three concerns, one of which was closed in Inspection Report No. 50-341/84-49. The remaining two items are discussed as follows:

- (1) Small Fires May Not Actuate Sprinklers - Use of Fast Response Sprinklers

The licensee was requested to provide documentation regarding parameters that would affect the actuation of the sprinkler systems including cable tray arrangements, room configurations, and air movement in the area. The licensee provided the inspector with their I.E. Circular 78-18 analysis dated May 21, 1985 and a sample of the Fermi 2 Sprinkler System Review, NFPA 13-1980, that was performed by Gilbert Commonwealth in September of 1984. The IE Circular 78-18 analysis discussed the use of fast response sprinkler heads on a fast developing fire. The results indicated that the sprinkler systems have been designed to existing standards for combustible liquid fires and therefore will control postulated fires for the areas of concern.

The IE Circular 78-18 analysis also listed areas with mechanical ventilation protected by automatic sprinkler systems. The list covered a range of 0.4 room air changes per hour for the 2nd floor reactor building to 5.6 room air changes per hour for the Reactor Core Isolation Cooling System (RCIC) room. The licensee indicated that none of these room air changes are considered excessive and would not affect the sprinkler systems.

The Fermi 2 Sprinkler System Review verified approximately thirty items, including NRC concerns on cable tray arrangements and room configuration. The review also verified that the sprinkler systems were installed per NFPA 13-1980 and adequately protected the subject areas.

Based on the IE Circular Analysis and the Fermi 2 Sprinkler System Review, the NRC concern regarding parameters affecting the sprinkler system have been addressed and are considered closed.

(2) The Path of Air Movement Influences the Actuation of Fire Detection Devices - Location of Detectors

As discussed in Inspection Report No. 50-341/84-49, a September 15, 1978 full scale fire test conducted by Underwriters Laboratories, Inc. (UL) identified that the path of air movement in an area influences the activation of detection devices and should be considered in the system layout. Licensee internal correspondence EF2-68261 dated April 23, 1984, indicated that air flow movements were considered in the fire detection system design and that the designs were being reviewed to the guidance of NFPA 72E.

The licensee further indicated that detectors were located away from air intake ducts and located to favor return air as recommended in NFPA 72E. In order to better understand the licensee's methodology in evaluating the path of air movement with respect to the fire detectors, the inspector reviewed a fire detector study conducted by Gilbert Commonwealth addressing several areas of concern including room air changes. The maximum air change noted was 25.5 changes per hour with ionization detectors covering approximately 100 square feet on a smooth ceiling. This is in accordance with the suggested spacing for high air movement areas in NFPA 72E.

During a plant tour, the inspector identified that the detectors in the control rod drive pump room (reactor building elevation 562'), the Division I pump room, and Division II pump room (RHR building elevation 590') did not appear to be installed according to NFPA 72E. The licensee committed in a letter dated March 4, 1985 (NE-859365) from W. Jens (Detroit Edison) to B. J. Youngblood (Nuclear Reactor Regulation) to install additional detectors or relocate detectors to meet the requirements of NFPA 72E or provide additional justification to the satisfaction of the NRC staff.

that equivalent detection capability exists. Based on License Condition 2.C.9(e), the licensee's fire detector study, the inspector observations, and the commitments made to NRR, the concern regarding detection devices and path of air flow movement has been addressed by the licensee and is considered closed. The additional deficiencies identified by the inspector require resolution in accordance with License Condition 2.C.9(e).

- b. (Closed) Open Item (341/84-49-15(DRS)): The licensee was requested to provide all documentation verifying the reliability of the spring closing force on dampers installed where mechanically induced air flows are greater than those specified in the fire rating of the damper. The licensee was also requested to provide certified test data from an accredited testing laboratory attesting to the fire endurance capability of all damper installations where the required fire endurance exceeds the tested configuration, and to demonstrate that all such damper installations provide an equivalent fire rating to the fire barrier in which they are installed.

In order to address the NRC concerns, the licensee provided the inspector with a damper list, a November 1984 air balance report titled, "Closure Tests for Model 319 Horizontal and Vertical Fire Dampers", damper initial functional tests for 10 randomly selected dampers, the procedure for administratively shutting down air flows in the event of a fire, and a parallel path air flow analysis.

The concern regarding the reliability of the spring closing force on dampers is addressed in the "Closure Tests for Model 319 Horizontal and Vertical Fire Dampers." The report indicates the maximum tested velocities for the exact damper size or the next larger damper size. The ganged type fire dampers with velocities that would exceed the maximum tested velocity have been identified and the licensee has incorporated additional procedures into the "Fire Protection Implementing Procedures" to shut down ventilation for those areas.

These actions resolve the NRC concern over closure of dampers with air flow in the system. As documented in the licensee's February 4, 1985 letter (NE-85-0275) from W. Jens (Detroit Edison) to B. J. Youngblood (Nuclear Reactor Regulation), a review of fire damper assemblies indicated that all damper assembly sizes are within the 3 hour test size limits except as follows:

Damper No.	Size	Position
F0 85	74"x30"	Vertical
F0 90	84"x84"	Vertical
F0 99	124"x76"	Horizontal
F0102	124"x76"	Horizontal
F0100	104"x68"	Vertical
F0101	104"x68"	Vertical

In Safety Evaluation Report Supplement No. 5, dated March 1985, NRR states, "Based on our review, we find that the use of 1 1/2 hour fire rated dampers in the 3 hour barrier cited above is an acceptable deviation from our guidelines in Section D.1(j) of Appendix A to BTP ASB 9.5-1." Based on the NRR approval of the licensee submittal on the ganged fire dampers, the concern over the damper installations that exceed the tested configuration has been addressed and is considered closed.

- c. (Closed) Open Item (341/85012-01(DRS)): The licensee committed to review the adequacy of the second floor sprinkler system (columns 12A-12C, elevation 613'-6") in the reactor building installed under the Engineering Design Package (EDP) 1772 (Revision 0) dated November 14, 1984. This review was to consider obstructions, ceiling heights, and ventilation air flows that could affect system performance.

The inspector reviewed the licensee's IE Circular 78-18 analysis dated May 21, 1985, which indicated that the second floor sprinkler system in the reactor building will not be affected by a ventilation flow rate of 0.4 room air changes per hour. The ceiling height is below 30 feet and the cable trays are within 10 feet of the ceiling. The sprinkler system has been reviewed and walked down by the licensee and no problems have been identified. The concern regarding the adequacy of this sprinkler system is considered closed.

The licensee also addressed the inspector's concern regarding two sprinkler heads that were spaced further apart than the proposed distance in the "Submittal of Deviations from Staff Interpretations of Fire Protection Features in 10 CFR 50, Appendix R and Justification (EF2-72717)," dated August 3, 1984. Their analysis indicated that the sprinkler system was spaced 12 inches further apart than specified in the "Submittal of Deviation". The licensee indicated in the analysis that there is 42 psi available at the last sprinkler head with all sprinkler heads operating, corresponding to an average density of 0.27 gallons per minute per square foot which is greater than the required density of 0.20 gallons per minute per square foot. Based on this information the licensee has demonstrated that the two sprinklers in question will perform as intended.

Inspection Report 341/85012 identified a concern regarding two drawing discrepancies for the reactor building fourth floor motor generator sets' sprinkler system (EC 659'-6"). To resolve the concern, the licensee provided the inspector with As-Built Notice 3324-1 Revision 0 which will update the sprinkler drawing to reflect the actual installation. This concern is considered closed.

- d. (Closed) Open Item (341/85014-01(DRS)): Procedure 20.000.19 requires that suppression pool cooling (RHR) be initiated within two hours. If this operation cannot be accomplished from the control room, the operator is referred to Enclosure 4 of the procedure to locally operate the necessary valves and start the pumps. Enclosure 4 states that cables to be cut have been identified by a distinctive type tape. The licensee used a white tape to identify all cables which must be lifted or cut. During a walkdown of the procedure, RHR

service water pump a 4160V cubicle was opened. All wires to be cut or lifted were properly identified with the exception of wires on terminal AJ-6.

On May 21, 1985, the inspector performed a walkdown to followup on this item and verified that the terminal wires required to be cut for the RHR service water pumps A, B, C, and D 4160V cubicles have been marked by the use of white tape including terminal AJ-6. During this walkdown, Enclosure 4 to Procedure No. 20.000.19, Revision 5, dated May 21, 1985, was used.

- e. (Open) Open Item (341/85014-02(DRS)): During a plant tour, the inspectors noted several QA Conditional Release Cards attached to plant equipment and questioned their status. Among the examples given to the licensee were conditional release #83-41, dated November 2, 1983 with cards hanging on a relay inside the switchgear cubicle for RHR service water pump A, and on Bus 72EA. The licensee was to determine which QA conditional release numbers were still outstanding and ensure those were the only ones still attached to their respective components.

A followup inspection was conducted on May 20-23, 1985. During this inspection the licensee indicated that only two QA conditional release numbers are still outstanding, implying that the issues associated with tags having other numbers had been resolved. The inspector informed the licensee that conditional release card #83-41 was observed to still be attached to a relay inside the switchgear cubicles for RHR service water pumps A and C. According to the Supervisor of Procurement QA, the licensee corrective action plans include the issuance of a memo to operations, maintenance, and QA personnel requesting that any QA Conditional Release Cards found in the field have their status determined through the appropriate QA group. This item will remain open pending completion of the licensee's corrective actions.

- f. (Closed) Open Item (341/85014-03(DRS)): Training of Operating Personnel on Safe Shutdown Procedures. The inspector reviewed the material covered during safe shutdown training conducted from April 29 thru June 3, 1985 and the Training Attendance Records and is satisfied that all six operating shifts were trained in the proper procedures which covered the changes generated by TCR's #T1208, 1209 and 1211.

### 3. Licensee Event Reports

- a. (Closed) Licensee Event Report No. 85-004: On April 4, 1984, the Nuclear Operations Fire Protection Supervisor discovered a floor plug which is part of a fire rated assembly and CO<sub>2</sub> system boundary removed. The licensee indicated that the floor plug was removed to allow the transport of equipment between the third and fourth floors of the auxiliary building. A fire watch was not established within one hour as described in the plant Technical Specifications. The plant was in operational condition 5 with core alterations in progress for initial fuel load during this event.

Based on the Licensee Event Report (LER), it appeared that the fire plug removal was not part of the original work order and that it was removed by maintenance contractor personnel who received permission from the Detroit Edison maintenance section general foreman. This is based in part on the fact that if the removal of the plug was part of the work order, the preparer would have been required to:

1. Identify on the work order the work scope involving the removal of a fire barrier.
2. Include specific provisions in the work order for reinstatement of the fire barrier including ensuring that actions were taken so that Technical Specifications were not violated.

In the LER, the licensee indicated that work order procedures and procedural and Technical Specification requirements for fire barriers have been reviewed by the appropriate maintenance section and contractor personnel. The inspector was provided with a memorandum dated April 22, 1985 from J. D. Leman, Maintenance Engineer to all Maintenance Section Personnel (MA-85-193), entitled "DER-NP-85-148, Fire Barrier Violation". This memorandum discussed the violation. It stressed the concern for specific requirements in the reinstatement of affected fire barriers in work packages and also stressed concerns regarding work packages that have not considered all work required to complete a job. The memorandum indicated that when work packages have not considered all work required to complete a job, personnel should contact their supervisor immediately to determine how the additional requirements are to be handled.

The inspector was given a copy of the "Operating or Maintenance Order" No. 98501 that requested that floor plugs in the RHR and reactor-auxiliary building be stenciled with the following: "This plug is a Fire Protection Boundary, Notify NSS before removal". The inspector verified that the stenciled markings for three floor plugs in the auxiliary crane hatch bay, were in place. The inspector also verified one stenciled floor plug located between two other floor plugs not stenciled in the auxiliary building 1st floor, elevation 583 feet - 6 inches. The inspector requested that the two floor plugs not marked be stenciled. The licensee acknowledged the inspector's concern. This LER is closed based on the licensee's corrective actions.

- b. (Open) Licensee Event Report No. 85-006: On April 20, 1985, during the performance of a valve lineup surveillance on the Division I Standby Gas Treatment System (SGTS) CO<sub>2</sub> System, a closed isolation valve was discovered. Subsequently, on April 22, 1985 at 2110 hours, the Division I SGTS exhaust fan failed to start during the routine monthly surveillance test.

The CO<sub>2</sub> system isolation valve closure was the result of a failure to follow procedures for processing the "Abnormal Lineup Sheet" prior to returning the system to service. The cause of the inoperability of the SGTS was the failure to recognize the potential for a trip and lockout relay to be actuated during a modification.

The licensee indicated in the LER that system operating procedures have been revised to include a discussion of the relay and its function. The inspector was unable to locate the pertinent section discussing the relay and its function in the revised procedure. In a telephone conversation on June 20, 1985 the licensee indicated to the inspector that the discussion of the relay and its function was not incorporated into the revised procedure because it would be addressed in operator training and that no other section of the procedure provides a discussion of equipment or its function. The licensee was cautioned to notify the NRC if the information in an LER was to be modified. The licensee was requested to re-evaluate the commitment regarding the discussion of the relay and its function to be incorporated in the revised procedure and provide a response concerning this item to the NRC Resident Inspector.

The licensee has incorporated into the Standby Gas Treatment Procedure, (Procedure No. 23.404, Revision 5, Section 4.10.2), a detailed instruction for the reset of the Cardox PE Relay. In addition, the licensee indicated in the LER that operator training on the SGTS will be revised to include a discussion of the relay. The licensee has been requested to provide to the NRC Resident Inspector the revised operator training documentation on the SGTS.

As discussed in the LER, a memorandum describing the incident and its cause has been placed on the required reading list for operators. The licensee has been requested to provide the NRC Resident Inspector the Required Reading and Review Sign Off Sheet for the LER.

In the LER, the licensee indicated that the procedure for returning the systems to service required by Technical Specifications will be modified to more explicitly discuss the actions and verifications which must be performed prior to declaring systems operable following modifications or maintenance. The inspector verified that the procedure for returning systems to service was revised and explicitly discussed actions and verifications following modifications or maintenance.

This LER will remain open pending NRC review and acceptance of the additional information to be provided to the Resident Inspector.

#### 4. License Condition 2.C.9.(e)

In a letter dated March 20, 1985 from Hugh L. Thompson Jr., NRR to Wayne Jens, Detroit Edison, the NRC transmitted Facility Operating License No. NPF-33 allowing operation at power levels not to exceed 5 percent of full power. License Condition 2.C.9(e) required the licensee to complete installation of all early warning fire detectors, have all fire door assemblies labeled or listed by a nationally recognized testing laboratory (unless accepted by NRR), and rehydro the fire protection yard piping. The hydrostatic test of the yard piping has been satisfactorily completed. The licensee is proceeding with actions to satisfy the other portions of License Condition 2.C.9(e). Closeout of the remaining portions of License Condition 2.C.9(e) will be performed by the Resident Inspectors. The inspectors have determined that once these actions have been completed,

License Condition 2.C.9(e) will have been met. A discussion of these items follows.

a. Detectors

In a letter dated March 4, 1985 (NE-85-0365) from W. Jens (Detroit Edison) to B. J. Youngblood (Nuclear Reactor Regulation), the licensee states in part "Detroit Edison commits to installing additional detectors or relocating detectors to meet the requirements of NFPA 72E or providing additional justification to the satisfaction of the NRC staff that equivalent detection capability exists." In a letter dated February 4, 1985 (NE-85-0275) the licensee indicated that a study of Fermi's fire detection system was performed to determine conformance to NFPA 72E. The licensee requested interim deviations with respect to NFPA 72E until June 30, 1985 for several detection zones to allow for installation and relocation of detectors as recommended by the evaluation.

During a walkdown of several fire detection systems for interference from mechanically induced air flows, the inspector noted three areas that did not strictly conform to NFPA 72E. Two of the three areas were previously identified in the fire detector study conducted by Gilbert/Commonwealth as not spaced according to NFPA 72E; however, the study indicated that sufficient fire detector coverage was provided. The two areas identified as not provided with detectors installed in accordance with NFPA 72E were located in the RHR building, Division I pump room (elevation 590'-0") and in the RHR building, Division II pump room (elevation 590'-0"). In each of these areas, three of the four detectors installed were not properly located. Two of the three improperly located detectors were located near an outside grill and one detector was located on the bottom of a beam that did not conform to smoke sensing detector beam construction criteria established by NFPA 72E. According to NFPA 72E, detectors should be installed inside areas formed by beams with a depth greater than 18 inches and spaced more than 8 feet on centers.

In the third deficient area identified by the inspector, the fire detector study indicated a smooth ceiling where beam criteria should have been specified. The third area is the control rod drive pump room where one ionization detector covered 1386 feet<sup>2</sup> of which approximately one half is not properly protected because the detector did not conform to the beam construction criteria established by NFPA 72E.

The three areas that did not meet NFPA 72E appeared to be isolated based on the fire detector study conducted by Gilbert/Commonwealth and observations made by the inspector. The fire detector study will be docketed as discussed in a July 3, 1985 telephone discussion between the licensee and Region III. The licensee has been requested to upgrade the detectors to meet NFPA 72E requirements in these areas. The installation and relocating of detectors in these areas is viewed as part of License Condition 2.C.9(e) which is to be completed prior to exceeding five percent power.

b. Fire Doors

A fire protection/safe shutdown capability inspection was conducted on March 18, 21, and May 10-13, 1983 in which several designated fire doors were observed either not having a UL label identifying the doors' fire resistance capability or the doors had 1 1/2 hour UL labels affixed instead of the required 3 hour fire resistive rating as stated in the FSAR. The licensee was issued a citation for not assuring that the requirements on design control and procurement document control were maintained and that certain fire doors were not listed by a nationally recognized testing laboratory. In the licensee's response to the item of noncompliance, dated November 14, 1983, the licensee noted that personnel involved in security believed the actual construction of the doors would be adequate for fire protection purposes, but failed to recognize the consequences of not receiving a label or verifying the fire resistive capability of the doors.

As part of their corrective action, the licensee contracted with UL to investigate, evaluate, and fire test where necessary, to assure the doors in question will satisfactorily perform their intended fire protection function. By letter dated April 24, 1984, from UL to the licensee, UL evaluated prototype fire door frame assemblies installed in the plant and concluded that, overall, the frames would be acceptable provided certain modifications were performed. Further, UL indicated that to label the licensee's fire doors, a field inspection by a UL representative would be required to determine whether or not the as-installed fire doors comply with UL's requirements.

According to the licensee's submittal dated February 4, 1985, all UL required modifications will be completed for the applicable fire door/frame assemblies to make them conform to acceptable UL design criteria with the exception of two doors. By letter dated March 1, 1985, NRR required the licensee to label or list the subject fire door assemblies using UL or some other approved laboratory.

As a followup to determine the status, including the extent of the fire door modifications, the inspector performed a review of several Engineering Change Requests, "Metal Door and Frame Specification Guide", as-built fire door drawings submitted to UL, licensee and NRC transmittals, and previous NRC inspection reports, and walked down fifty-seven fire door assemblies (having modifications done on them) using the FSAR and FHA reports. During the walkdown, several FSAR drawing discrepancies were observed which the licensee's staff were aware of. The licensee had not updated the FSAR drawings but had initiated an as-built change notice to do so.

At the exit meeting of May 23, 1985, the inspector categorized the fire door assembly modifications as ranging from minor (i.e., filling screw holes where signs had been removed) to extensive (i.e., steel bar stock added to the entire door stop portion of the frame assembly and installation of a sill plate on the floor in the door assembly opening). Thirteen doors were being replaced according to the licensee.

On June 11, 1985, a UL representative accompanied by an NRC Regional Inspector visually observed work completed by the licensee on several fire door assemblies. The UL representative indicated to the licensee that hardware changes were needed for UL to label these fire door assemblies. The licensee's actions relative to the hardware changes and UL labeling of the fire door assemblies will satisfy the License Condition 2.C.9(e) required to be completed prior to exceeding five percent power.

c. Hydrostatic Test of the Underground Fire Main

As documented in Inspection Report No. 50-341/84-49, a review of pre-operational test results indicated inconsistent pressures and flows recorded for the ten year old underground fire main system hydrostatic test. In addition, it appeared that the hydrostatic test was not conducted at the proper pressure. The licensee acknowledged the inconsistencies in the test and agreed to retest the system at 200 psig. Further, the licensee indicated that a code interpretation would be obtained to determine the maximum test pressure for the system. If the code interpretation stated that the test pressure should be greater than 200 psi, the licensee agreed to retest the system to the higher pressure (a test pressure greater than 200 psi would also require retesting interior standpipe hose stations and automatic sprinkler systems at this higher pressure). This item is considered an open item (341/85025-01) pending review and acceptance by Region III of the licensee submittal regarding the results of the formal interpretation. In the interim, the licensee conducted a hydrostatic test on May 31, 1985 at a test pressure of 200 psi. The measured leakage rate was 253 gallons for two hours. In a telephone conversation on June 27, 1985 between NRR and Region III, it was determined that NRR accepted the licensee's hydrostatic test. The License Condition 2.C.9(e) regarding the hydrostatic test has been satisfied.

5. 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. An open item disclosed during the inspection is discussed in Paragraph 4.c.

6. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on May 23, and June 11, 1985, and summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors. In addition, a telephone conference call was held between the licensee and Region III staff on June 6, 1985, to further discuss the inspection findings identified during in office review of documentation provided during the inspection of May 20-23, 1985. The inspectors also discussed the likely informational content of the inspection report with regard to documents reviewed by the inspector during the inspection. The licensee did not identify any such documents as proprietary.