

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/93025(DRP)

Docket No. 50-341

License Nos. NPF-43

Licensee: Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

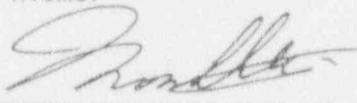
Facility Name: Fermi 2

Inspection At: Fermi Site, Newport, Michigan

Inspection Conducted: November 5 through December 13, 1993

Inspectors: W. J. Kropp  
K. Riemer

Approved By:

  
M. P. Phillips, Chief  
Reactor Projects Section 2B

12/30/93  
Date

Inspection Summary

Inspection from November 5, 1993, through December 13, 1993  
(Report No. 50-341/93025(DRP))

Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of actions on previous inspection findings; operational safety verification; current material condition; housekeeping and plant cleanliness; radiological controls; security; regional requests; maintenance and surveillance activities; engineering and technical support; and report review.

Results: Of the ten areas inspected, no violations, deviations, or inspection followup items were identified. One unresolved item was identified that pertained to maintenance activities associated with the replacement of a leaking instrument valve that caused a plant transient (paragraph 5.a).

The following is a summary of the licensee's performance during this inspection period:

Plant Operations:

The licensee's performance in this area was good. The licensee improved the plan of the day (POD) by identifying on the POD major activities and technical issues for the day. Shift briefings continue to be good. The operator's response on December 3, 1993, to the loss of "C" steam flow indication was excellent. The material condition was good during this inspection period. Housekeeping continues to be excellent.

Maintenance and Surveillance:

The licensee's performance during this period was mixed. The repair to a Modular Power Unit No. 1 voltage regulator was well planned and performed in a timely manner. However, the maintenance activities associated with the replacement of a leaking instrument valve were less than adequate. A low reactor water level alarm was caused by a maintenance worker closing a valve without adequate review of the potential impact on plant operation. The closure of the valve occurred because of weaknesses in written communications, lack of a questioning attitude, and inadequate work planning and control.

Engineering and Technical Support:

The licensee's performance in this area was good. The licensee's investigation and resolution to a potential fastener problem was thorough and technically sound.

## DETAILS

### 1. Persons Contacted

#### Detroit Edison Company

G. Baker, Illinois Power  
J. Bragg, Group Leader, QA Audits  
G. Casey, NPPO, Operations  
J. Crews, Consultant  
R. Delong, Superintendent, Radiation Protection  
R. Eberhardt, Assistant to Plant Manager  
P. Fessler, Director, Technical Manager  
L. Fron, Supervisor, Turbine  
D. Gipson, Senior Vice President, Nuclear Generation  
L. Goodman, Director, Nuclear Quality Assurance  
T. Greene, NMT, Maintenance  
E. Hare, Senior Compliance Engineer  
J. Korte, Director, Nuclear Security  
A. Kowalczyk, Director, Plant Support  
J. Malaric, Supervisor, Modifications  
P. Marquardt, General Attorney  
R. Matthews, Supervisor, Shift Testing  
R. McKeon, Plant Manager, Nuclear Production  
W. Miller, Technical Support  
R. Newkirk, Supervisor, Licensing  
E. Nickolite, GS ICMA, Maintenance  
J. Nolloth, Superintendent, Maintenance  
J. Nyquist, Supervisor, Safety Engineering  
D. Ockerman, Director, Nuclear Training  
J. Pendergast, Compliance Engineer  
G. Pierce, Work Control  
J. Plona, Superintendent, Operations  
D. Powell, Nuclear Shift Supervisor, Operations  
G. Smith, Director, Nuclear Fuel  
S. Swope, NSO, Operations  
R. Szkotnicki, Supervisor, Inspection & Surveillance  
J. Tibai, Compliance, Licensing  
J. Walker, Director, Plant Engineering

All of the above individuals attended the exit interview conducted on December 13, 1993.

The inspectors also had discussions with other licensee employees, including members of the technical and engineering staffs, reactor and auxiliary operators, shift supervisors, and electrical, mechanical and instrument maintenance personnel, and security personnel.

2. Action on Previous Inspection Findings (92701)

- a. (Closed) Inspection Followup Item (341/91025-01): The Technical Specification (TS) surveillance article cross reference computer data base to contain all surveillance requirements included in TS footnotes. The inspector reviewed a May 1993 printout of the TS cross reference and determined that the licensee has incorporated TS surveillance requirements contained in footnotes into the cross reference. This item is considered closed.
- b. (Open) Unresolved Item (341/93018-04 (DRP)): Licensee's corrective actions for past problems associated with jumper removal. On August 24, 1993, Containment Isolation Valve B31F016A closed when jumpers were installed during a surveillance test. This event was documented in LER 93-011. The most probable cause of the closure of B31F016A was a fuse that blew when a jumper was grounded during installation. The licensee's corrective action to preclude recurrence was the installation of star lugs at the jumper locations which would allow for easier installation of the jumpers. LER 93-011 identified two other similar events which were documented in LERs 91-017 and 91-019. These LERs documented actuation of containment isolation valves caused by the removal of jumpers inside panels. The inspectors reviewed these LERs and old LERs. The following is a synopsis of this review:

- In December 1987, a blown fuse occurred during a calibration of a radiation monitor which caused the automatic actuation of Division I of Standby Gas Treatment. The fuse blew when a jumper was being installed on terminals in a panel. This event was documented in LER 87-054. The long term corrective actions included an evaluation of these terminals for inclusion in Engineering Design Package 1706. This design change was to install star lugs in order to improve accessibility for testing.
- LER 91-017 pertained to the August 1991 inadvertent closure of the Reactor Core Isolation Cooling (RCIC) Turbine Exhaust Line Vacuum Breaker Isolation Valve, E5150F062. The corrective actions stated in LER 91-017 included the initiation of Potential Design Change (PDC) 12600 to install test jacks on the front of the panel to eliminate the need for jumpers.
- LER 91-019 pertained to the November 1991 inadvertent closure of the Reactor Water Cleanup (RWCU) Inboard Isolation Valve, G3300F001. The corrective actions included a design change to eliminate the need for jumpers to restore the RWCU system following an isolation.

The licensee identified in LER 93-011 that one of the root causes for the valve actuations was that the previous review for star lug installation had not included all potentially impacted procedures.

The review encompassed only Instrument and Controls procedures and was an example of inadequate corrective action. On December 14, 1993, an Escalated Enforcement Conference was convened to discuss the effectiveness of the licensee's corrective action program. Pending the results of this Conference this item will remain open.

- c. (Open) Unresolved Item (341/93018-05 (DRP)): Repetitive problems with Modular Power Units (MPU) and valve G3300F120. There have been several failures of voltage regulators for MPUs. The inspectors determined that voltage regulators failed in 1988 (MPU #2), 1990 (MPU #3), 1991 (MPU #5), and 1993 (MPU #1 in September, October and November). Also, Valve G3300F120, the Reactor Water Clean-Up (RWCU) to Feedwater Spring Assist Close Check Valve, failed Surveillance 24.707.001 on October 6, 1993. The licensee's investigation determined that the wrong spring had been installed in the actuator during a replacement in April 1993. Further review of the maintenance history for Valve G3300F120 by the inspectors determined that since 1990 there have been actuator problems noted in work requests in February 1990, April 1990, November 1990, January 1993, March 1993, April 1993, and October 1993. The repetitive actuator and MPU problems indicated an inadequate corrective action program. On December 14, 1993, an Escalated Enforcement Conference was convened to discuss the effectiveness of the licensee's corrective action program. Pending the results of this Conference this item will remain open.
- d. (Open) Unresolved Item (341/93018-07 (DRP)): Potential common mode failure for motor operated valves (MOV). In January 1993, the Maintenance Effectiveness Group initiated Potential Design Change (PDC) 13770 to request engineering assistance to determine root cause of MOV failures. The basis of this request was eight MOV failures between 1988 and 1992 that appeared to be caused by sticking auxiliary contacts. System engineering voided PDC 13770 in February 1993. Until October 1993, there were no licensee actions to ascertain the root cause of eight MOV failures between 1988 and 1992. The licensee initiated actions to investigate the MOV failures in October 1993 when Valve E5150F019, the Reactor Core Isolation Cooling (RCIC), failed to open during a surveillance. The licensee's investigation included performing tests on contactors and auxiliary contacts. The tests included actuating the contactors and auxiliary contacts numerous times under simulated plant conditions. At the end of the inspection period, the licensee identified a potential cause for the MOV failures that was repeatable and covered all the symptoms experienced. The cause involved hold-down clips for a cover that, if not snapped firmly shut into place, could hold the contacts open and prevent the valve from operating. The inspectors will follow the completion of the licensee's investigative efforts during routine future inspections. The licensee also plans more tests on the contactors and auxiliary contacts that have been subjected to the lubricants and cleaners used during maintenance activities. The licensee could not identify through discussions

with the vendor and other utilities any previous known problem with these components.

Even though the licensee has commenced a thorough investigation, the inspectors did not consider the investigation into the potential problems with MOV auxiliary contacts as timely, especially considering that since January 1993 the following valves have failed:

<u>DATE</u>	<u>VALVE</u>	<u>WORK REQUEST</u>	<u>DESCRIPTION</u>
5/93	E1150F028A	000Z932449	Replaced contactor
9/93	E5150F019	000Z933866	Replaced auxiliary contacts
9/93	G5100F601	G420921116	Auxiliary contacts stuck
11/93	E5150F002	000Z935200	Replaced contactor
11/93	E1150F028A	000Z935185	Replaced auxiliary contacts

The lack of timeliness in resolving the MOV problems was another example of inadequate corrective action. On December 14, 1993, an Escalated Enforcement Conference was convened to discuss the effectiveness of the licensee's corrective action program. Pending the results of this Conference this item will remain open.

3. Plant Operations

During this inspection period, Fermi 2 operated at power levels up to 33 percent.

a. Operational Safety Verification (71707)

The inspectors verified that the facility was being operated in conformance with the license and regulatory requirements, and that the licensee's management control system was effective in ensuring safe operation of the plant.

On a sampling basis, the inspectors verified proper control room staffing and coordination of plant activities; verified operator adherence with procedures and technical specifications; monitored control room indications for abnormalities; verified that electrical power was available; and observed the frequency of plant and control room visits by station management. The inspectors reviewed applicable logs and conducted discussions with control room operators throughout the inspection period. The inspectors observed a number of control room shift turnovers. The turnovers were conducted in a professional manner and included log reviews, panel walkdowns, discussions of maintenance and surveillance activities in progress or planned, and associated LCO time restraints, as applicable.

On December 3, 1993, at 12:50 p.m. a low reactor water level alarm was received. The drop in reactor water level occurred when a

maintenance worker opened a valve that resulted in the loss of steam flow indication for the "C" Steam Line. The loss of steam flow indication was caused by the closure of an excess flow check valve. With no steam flow indicated in Steam Line "C", the reactor water level control system, which was in three element control, reduced reactor feedwater flow to match indicated steam flow. Since actual steam flow had not changed, the decreased reactor feedwater flow caused the reactor water level to decrease. The Nuclear Supervising Operator (NSO) responded to the low reactor water level alarm and the indicated "C" low steam flow by placing the reactor feed pumps in manual and increasing feedwater flow to recover reactor water level. Reactor water level dropped from a nominal 196 inches to 183 inches in approximately 14 seconds. The operators response to this unplanned transient was excellent. For further details concerning this plant transient see paragraph 5.a of this report.

b. Current Material Condition (71707)

The inspectors performed general plant as well as selected system and component walkdowns to assess the general and specific material condition of the plant, to verify that work requests had been initiated for identified equipment problems, and to evaluate housekeeping. Walkdowns included an assessment of the buildings, components, and systems for proper identification and tagging, accessibility, fire and security door integrity, scaffolding, radiological controls, and any unusual conditions. Unusual conditions included but were not limited to water, oil, or other liquids on the floor or equipment; indications of leakage through ceiling, walls or floors; loose insulation; corrosion; excessive noise; unusual temperatures; and abnormal ventilation and lighting. The material condition was considered good during this inspection period.

During a plant walkdown, the inspectors identified that fasteners on Instrument Racks, H21-P631A and H21-P631B, did not have consistent material specification markings. This item is further discussed in paragraph 6 of this report.

c. Housekeeping and Plant Cleanliness

The inspectors monitored the status of housekeeping and plant cleanliness for fire protection and protection of safety-related equipment from intrusion of foreign matter. The housekeeping continues to be excellent.

d. Radiological Controls (71707)

The inspectors verified that personnel were following health physics procedures for dosimetry, protective clothing, frisking, posting, etc., and randomly examined radiation protection instrumentation for use, operability, and calibration.

e. Security (71707)

Each week during routine activities or tours, the inspectors monitored the licensee's security program to ensure that observed actions were being implemented according to the approved security plan. The inspectors noted that persons within the protected area displayed proper photo-identification badges, and those individuals requiring escorts were properly escorted. Additionally, the inspectors observed that personnel and packages entering the protected area were searched by appropriate equipment or by hand.

No violations or deviations were identified.

4. Regional Request (92701)

The Region III office requested information pertaining to Boiling Water Reactor core shroud cracking. No known problems or indications were observed during previous licensee inspections of the shroud at Fermi 2. The requested information was transmitted to the Region III office.

5. Maintenance/Surveillance (62703 & 61726)

a. Maintenance Activities (62703)

Routinely, station maintenance activities were observed and/or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with technical specifications.

The following items were also considered during this review: limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; and activities were accomplished by qualified personnel.

Portions of the following maintenance activities were observed or reviewed:

- 000Z934400 RHR LPCI Valve Packing Leak
- E056930325 Loop Cal Check for IST RHR Service Water Flow "B"
- WB9993025 Cal Div 2 RHR Pump Discharge to Reactor Flow Loop
- 000Z935432 Investigate/Repair Fluctuating Voltage Output

- 000Z935435 Replace Voltage Regulator MPU No. 1, Regulator No. 3
- R03792116 Inspect and test spare 130 Volt battery charger.
- 000Z932708 Replace leaking Valve B2100F171.

On December 3, 1993, a maintenance worker opened a drain valve on instrument rack H21-P423A during the maintenance activity described in Work Request (WR) 000Z932708. WR 000Z932708 was issued to replace leaking Instrument Valve B2100F171 with a new valve. The maintenance workers had difficulty finding the valve and in fact identified an incorrect valve for replacement. In addition, even though the WR did not require a purge path for welding during the installation of the new valve, the maintenance workers located a valve that would provide a purge path. This valve was a drain valve for the instrument line associated with Steam Line "C" flow indication. When this valve was opened by the maintenance worker, the excess flow check valve in the associated instrument line closed, resulting in the isolation of the "C" Steam Flow Instrument Line. This resulted in a plant transient which is described in paragraph 3.a of this report. This plant transient occurred as a result of ineffective written communication of the assigned work in the work package; the lack of a questioning attitude on the part of the maintenance workers; and ineffective control over valve manipulations. This matter is considered an Unresolved Item pending further licensee and NRC review (341/93025-01 (DRP)).

The inspectors reviewed the Abnormal Lineup Sheets for work requests 000Z934400, E056930325, and WB9993025 with no problems being noted.

b. Surveillance Activities (61726)

During the inspection period, the inspectors observed technical specification required surveillance testing and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that results conformed with technical specifications and procedure requirements and were reviewed, and that any deficiencies identified during the testing were properly resolved.

The inspectors also witnessed or reviewed portions of the following surveillances:

- 54.000.006 "APRM Calibration"
- 24.307.15 "EDG No. 12 Start and Load Test-Slow Start"
- 47.000.02 "Mechanical Vibration Measurements for Trending (EDG No. 12)"

No violations or deviations were identified.

6. Engineering & Technical Support (37700)

During a plant walkdown the inspectors identified that fasteners on Instrument Racks, H21-P631A and H21-P631B, did not have consistent material specification markings. The fasteners in question were used in securing Rosemount pressure transmitters to a mounting bracket and the mounting bracket to a plate on the instrument rack. The Rosemount Pressure Transmitters were used for wide (T50N414A(B)) and narrow (T50N499A(B)) range pressure monitoring of the drywell and torus after a design base accident. The inspectors requested that the licensee's Quality Assurance organization validate that the fastener material met the installation requirements. The inspectors and the licensee's engineering and QA organizations determined that the fastener material used to mount the transmitters to their brackets met the requirements of Society of Automobile Engineers (SAE) J429 and the fasteners used to mount the transmitter brackets to their plates met the requirements of American Society of Testing and Materials (ASTM) A 193 for Transmitters T50N499A and B; ASTM A449 for Transmitter T50N414A; and SAE J449 for Transmitter T50N414B.

The inspectors reviewed the licensee's design documents and the Vendor Manual VMR1-4.22.1 for Rosemount transmitters. The design documents included seismic calculations DC 1602 and DC 3316 and Drawing 6I721-2510-9 and addressed the material requirements for the fasteners used in mounting the bracket to the plate and the plate to the instrument rack. The inspectors determined that the installation of the plate to the instrument rack and the transmitter bracket to the plate utilized fasteners meeting or exceeding the seismic calculations in DC 1602 and 3316. Even though the design documents did not address the fasteners used in mounting the transmitters to their brackets, the vendor supplied these fasteners with the transmitters and the licensee stated that the vendor's (Rosemount) seismic qualification testing for the transmitters would be the basis for seismic qualification.

In addition, the inspectors identified that the fasteners for mounting the Rosemount transmitters to their brackets were torqued to 45 ft-lbs with the vendor manual specifying a torque value of 21 ft-lbs. The licensee determined that the 45 ft-lbs of torque on these fasteners did not have an adverse affect on the seismic qualification of the fasteners.

No violations or deviations were identified.

7. Report Review

During the inspection period, the inspector reviewed the licensee's Monthly Operating Status Report for October 1993. The inspector confirmed that the information provided met the requirements of Technical Specification 6.9.1.6 and Regulatory Guide 1.16.

The inspector also reviewed the licensee's Monthly Performance Report for October 1993.

No violations or deviations were identified.

8. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An Unresolved Item disclosed during the inspection is discussed in paragraph 5.a.

10. Meetings and Other Activities

Exit Interview (30703)

The inspectors met with the licensee representatives denoted in paragraph 1 during the inspection period and at the conclusion of the inspection on December 13, 1993. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.