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10CFR50.73

October 3, 1994
NRC-94-0082

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

- References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43
- 2) Detroit Edison Letter NRC-89-0039,
"Proposed Technical Specification
Change (License Amendment) - Source
Range Monitoring Instrumentation
(3/4.3.6, 3/4.3.7.6, 3/4.9.2),"
dated April 3, 1989

Subject: Licensee Event Report (LER) No. 94-006

Please find enclosed LER No. 94-006, dated October 3, 1994, for a reportable event that occurred on September 3, 1994. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

The following commitments are made in this LER:

1. During future refueling outages, connector integrity will be verified for downscale SRM's and IRM's prior to initiating core alterations after work has been performed which could impact connector integrity.
2. Potential accessibility improvements will be evaluated to improve working conditions under the RPV. Any improvements will be scheduled in accordance with the 5 year plan.
3. Procedure 82.000.04 will be modified to provide guidance on the expected response of SRM's when initially loading fuel.

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Page 2

If you should have any questions, please contact Joseph E. Conen,
Supervisor, Compliance at (313) 586-1960.

Sincerely,

Robert McKeon

Enclosure: NRC Forms 366, 366A

cc: T. G. Colburn
J. B. Martin
M. P. Phillips
K. R. Riemer
P. L. Torpey

Wayne County Emergency
Management Division

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Fermi 2

DOCKET NUMBER (2)

05000-341

PAGE (3)

1 OF 5

TITLE (4)

Core Alterations with Inoperable Source Range and Intermediate Range Monitors

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT NUMBER (7) | | | OTHER FACILITIES INVOLVED (8) | |
|--------------------|-----|------|---|-------------------|------------------|-------------------|----------------------|------|--|---------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 09 | 03 | 94 | 94 | 006 | 00 | 10 | 03 | 94 | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | | 05000 |
| OPERATING MODE (9) | | 5 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | |
| POWER LEVEL (10) | | 000 | 20.402(b) | | 20.405(c) | | 50.73(a)(2)(iv) | | 73.71(b) | |
| | | | 20.405(a)(1)(i) | | 50.36(c)(1) | | 50.73(a)(2)(v) | | 73.71(c) | |
| | | | 20.405(a)(1)(ii) | | 50.36(c)(2) | | 50.73(a)(2)(vii) | | OTHER | |
| | | | 20.405(a)(1)(iii) | | X 50.73(a)(2)(i) | | 50.73(a)(2)(viii)(A) | | (Specify in Abstract below and in Text, NRC Form 366A) | |
| | | | 20.405(a)(1)(iv) | | 50.73(a)(2)(ii) | | 50.73(a)(2)(viii)(B) | | | |
| | | | 20.405(a)(1)(v) | | 50.73(a)(2)(iii) | | 50.73(a)(2)(x) | | | |

LICENSEE CONTACT FOR THIS LER (12)

NAME

Joseph E. Conen, Supervisor, Compliance

TELEPHONE NUMBER (Include Area Code)

(313) 586-1960

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| | | | | | | | | | |
| | | | | | | | | | |
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SUPPLEMENTAL REPORT EXPECTED (14)

| | | | | | |
|---|------|-------------------------------|-------|-----|------|
| YES (If yes, complete EXPECTED SUBMISSION DATE:) | X NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| | | | | | |

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

When initiating reload of the core, three irradiated and one new fuel assembly were placed around Source Range Monitor (SRM) B. The SRM remained downscale. When irradiated fuel was placed beside SRM C, it indicated four counts per second. Fuel movement was stopped and the operability of SRM B further investigated.

The SRM B cable connector under the vessel had become disengaged sometime during the outage. Upon discovery, the cable was properly connected and tested. SRMs A and D were also tested to verify connector integrity, and fuel loading resumed. Subsequent investigation revealed that Intermediate Range Monitor (IRM) channels C, F, and G were also inoperable for similar reasons.

Connector integrity will be verified for downscale SRMs and IRMs during future refueling outages after work which could impact connector integrity has been performed. Also, a procedure revision will be made to provide guidance on the expected response of the SRMs when loading fuel. Potential improvements for accessibility under the vessel will be evaluated.

REQUIRED NUMBER OF DIGITS/CHARACTERS
FOR EACH BLOCK

| BLOCK NUMBER | NUMBER OF DIGITS/CHARACTERS | TITLE |
|-----------------|---|------------------------------|
| 1 | UP TO 46 | FACILITY NAME |
| 2 | 8 TOTAL 3 IN ADDITION TO 05000 | DOCKET NUMBER |
| 3 | VARIES | PAGE NUMBER |
| 4 | UP TO 76 | TITLE |
| 5 | 6 TOTAL 2 PER BLOCK | EVENT DATE |
| 6 | 7 TOTAL 2 FOR YEAR 3 FOR SEQUENTIAL NUMBER 2 FOR REVISION NUMBER | LER NUMBER |
| 7 | 6 TOTAL 2 PER BLOCK | REPORT DATE |
| 8 | UP TO 18 -- FACILITY NAME 8 TOTAL -- DOCKET NUMBER 3 IN ADDITION TO 05000 | OTHER FACILITIES INVOLVED |
| 9 | 1 | OPERATING MODE |
| 10 | 3 | POWER LEVEL |
| 11 | 1 CHECK BOX THAT APPLIES | REQUIREMENTS OF 10 CFR |
| 12 | UP TO 50 FOR NAME 14 FOR TELEPHONE | LICENSEE CONTACT |
| 13 | CAUSE VARIES 2 FOR SYSTEM 4 FOR COMPONENT 4 FOR MANUFACTURER NPRDS VARIES | EACH COMPONENT FAILURE |
| 14 | 1 CHECK BOX THAT APPLIES | SUPPLEMENTAL REPORT EXPECTED |
| 15 | 6 TOTAL 2 PER BLOCK | EXPECTED SUBMISSION DATE |

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

| FACILITY NAME (1) | | DOCKET NUMBER (2) | | LER NUMBER (6) | | | PAGE (3) |
|-------------------|--|-------------------|--|----------------|-------------------|-----------------|----------|
| Fermi 2 | | 05000-341 | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | 2 OF 5 |
| | | | | 94 | - 006 - | 00 | |

TEXT (If more space is required, use additional copies of NRC Form 366A). (17)

Initial Plant Conditions:

Operational Condition: 5 Refueling
Reactor Power: 0 percent
Reactor Pressure: 0 psig
Reactor Temperature: 89 degrees Fahrenheit

Description of the Event:

On September 3, 1994, Fermi 2 was preparing to initiate core reload from the fourth refueling outage. During the outage, the core had been off loaded. Therefore, all of the Source Range Monitors, (SRMs) [(JC)(MON)], were reading downscale as expected. As is normal practice, it was intended to load four fuel assemblies, including some irradiated assemblies, around each SRM to obtain at least the minimum count rate required for core alterations for the rest of the reload. Technical Specification 3.9.2 requires that at least two SRM channels be operable with one of the required SRMs located in the quadrant where core alterations are being performed and the other in an adjacent quadrant. The SRM minimum count rate is not required when sixteen or fewer fuel assemblies, each directly adjacent to an SRM detector, are in the core. After verifying that the appropriate Technical Specification surveillances had been completed, a shift briefing was held. While it was understood that the SRMs should detect some count rate during fuel load, no specific information on what response to expect was provided to the shift, although it was made clear that the minimum count rate was required prior to moving the seventeenth bundle.

The first fuel assembly was inserted in the core at 2235 hours. This assembly, which had been previously irradiated, was placed beside SRM B. The SRM continued to indicate downscale. The next three assemblies, one new and two previously irradiated, were placed around SRM B. The SRM remained downscale.

The next move placed a nonirradiated assembly adjacent to SRM C, which remained downscale. During this time, an operations shift turnover was in progress, and control room personnel were discussing the response of SRM B. The recorder was checked to see if it was functioning properly. The pen for SRM B moved from the offscale low to the 0.1 line. Investigation in the relay room showed that all the SRMs were reading downscale, with A and D further downscale than B and C.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

The sixth assembly, which had been previously irradiated was placed beside SRM C. SRM C's indication was observed to be four counts per second. This indication versus that of SRM B was discussed by the shift management. At 2353 hours, it was decided to suspend core alterations for further investigation. Since the next assembly was already being moved, it was placed in its appropriate position beside SRM C.

During trouble shooting, Instrumentation and Control technicians discovered that the detector cable connector for SRM B had partially separated. The connection was reworked and verified to be functioning via satisfactory time domain reflectometer testing. Further, SRM B was no longer reading downscale. In addition, the cable integrity of SRMs A and D was also verified via time domain reflectometer testing. SRM C was known to have continuity due to the onscale count rate.

On September 5, 1994, core alterations were resumed and core reload continued until suspended on September 7, 1994 (for unrelated reasons) after approximately a third of the fuel assemblies had been loaded into the reactor. In parallel, a team investigating the SRM connector problem determined that continuity of Intermediate Range Monitor (IRM) [(JC)(MON)] cable/connector assemblies should also be verified. Testing on September 19, 1994, found discontinuity on 3 of 8 IRMs (channels C, F, and G) which has subsequently been verified to be located at the detector connector assemblies.

This condition is being reported in accordance with 10CFR50.73.(a)(2)(i)(B) as an operation or condition prohibited by Technical Specifications 3.9.2, 3.3.1, and 3.3.6.

Cause of the Event:

The SRM and IRM detectors and associated cables are located in dry tubes inside the vessel, allowing the detectors to be inserted and retracted, as necessary. The retractable cables are connected underneath the vessel to shielded coaxial cables. These cables carry the signals to preamplifiers located outside primary containment.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

The cable connectors had apparently become separated due to stress applied to the cables during work under the vessel during the outage. It is known that the SRMs and IRMs were operable when the vessel was being defueled. A significant amount of work was performed under the vessel, which is a congested area, during the outage. It can not be conclusively determined when or how the disconnection of the SRM and IRM cables occurred; however, based on the lack of response from SRM B prior to reworking the connection, it was judged that the affected SRM and IRMs were inoperable when core reload began.

Analysis of the Event:

The SRMs are designed to provide neutron flux information and control rod withdrawal block functions during core alterations and reactor start up through low power operation. The IRMs provide similar functions in the low power ranges and also provide reactor trip functions.

While the condition that occurred was not in accordance with Technical Specifications, the actual safety significance was minimal. Only the first 7 fuel assemblies were loaded into the core while SRM B was inoperable. As indicated in reference 2, criticality is not possible with 16 fuel assemblies (four assemblies adjacent to each SRM detector), even if the configuration is uncontrolled with optimum moderation and worst-case fuel reactivity. Additionally, all control rods were inserted with a rod block in place in accordance with procedures.

The significance of the 3 inoperable IRM channels was similar. All control rods remained fully inserted into the core during the time the IRMs were inoperable and a rod block was in place in accordance with our procedures, except during surveillance testing. For that testing, 3 control rods were withdrawn and reinserted (one at a time) one notch. These control rods are located in peripheral areas of the core which had no nearby fuel (only 7 fuel assemblies were in the reactor at the time). Thus the degraded rod block and reactor trip functions had minor safety significance. All SRMs had been returned to operable status at that time, providing indication and rod block functions in all quadrants.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Corrective Actions:

During the present outage, cables for the Local Power Range Monitors (LPRMs) and the Control Rod Position Indication Probes (PIPs) were rerouted to decrease the congestion in the area.

Individuals performing work under the vessel routinely receive training including reminders about the need for extra caution when the potential for contacting the cables exists.

In order to minimize the likelihood that this type of event will occur during future refueling outages, connector integrity will be verified for downscale SRMs and IRMs prior to initiating core alterations after work has been performed which could impact connector integrity. Procedure 82.000.04, "Refueling and Core Post-Alteration Verification", will be modified to provide guidance on the expected response of the SRMs when initially loading fuel. These corrective actions will be in place prior to the next reload when this type of situation could arise.

Potential further improvements in accessibility under the vessel will be evaluated. If it is determined that any more improvements will be made, these will be scheduled in accordance with the site's five year plan.

Previous Similar Events:

While SRM and IRM connectors have been separated and/or damaged in the past due to work under the vessel, this is the first time that it has resulted in a reportable condition.