

September 24, 2008

Mr. Joseph Plona
Site Vice President
Nuclear Generation
The Detroit Edison Company
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: NRC INSPECTION REPORT 050-00016/08-09(DNMS) – ENRICO
FERMI UNIT 1

Dear Mr. Plona:

On August 28, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Enrico Fermi Unit 1 facility. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements in the areas of facility management and control, and radiological safety. At the conclusion of the inspection on August 28, 2008, the NRC inspector discussed the findings with members of your staff.

The inspection consisted of an examination of activities at the facility as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, field observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC did not identify any violations.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). The NRC's document system is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

J. Plona

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We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Christine Lipa, Chief
Decommissioning Branch

Docket No. 050000016
License No. DPR-9

Enclosure:
Inspection Report 050-00016/2008-009(DNMS)

cc w/encl: J. Plona, Vice President,
Nuclear Generation
K. Hlavaty, Plant Manager
R. Gaston, Manager, Nuclear Licensing
D. Pettinari, Legal Department
Michigan Department of Environmental Quality
G. Williams, Director, Monroe County
Emergency Management Division
Supervisor - Electric Operators
T. Strong, State Liaison Officer
Wayne County Emergency Management Division

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Letter to Mr. Joseph Plona from Ms. Christine Lipa dated September 24, 2008.

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FERMI UNIT 1

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.: 050000016
License No.: DPR-9

Report No.: 050000016/08-09(DNMS)

Licensee: Detroit Edison Company

Facility: Enrico Fermi Unit 1

Location: 6400 North Dixie Highway
Newport, MI 48166

Inspection Dates: August 27 and 28, 2008

Inspector: Peter J. Lee, Ph.D., CHP, Health Physicist
William Snell, Senior Health Physicist

Approved by: Christine Lipa, Chief
Decommissioning Branch

Enclosure

EXECUTIVE SUMMARY

ENRICO FERMI UNIT 1 NRC Inspection Report 050000016/08-09(DNMS)

This routine decommissioning inspection included reviews of facility management and control, and radiological safety.

Facility Management and Control

- The inspectors determined that the Review Committee was meeting and carrying out its responsibilities as required, and the licensee was acceptably implementing its condition assessment resolution document process. (Section 1.1)
- The inspectors determined that the licensee adequately evaluated the root causes of a May 20, 2008, pipe failure while processing sodium in Primary Loop No. 3, which resulted in a sodium fire. The corrective actions taken to prevent a recurrence of the pipe failure appeared adequate. (Section 1.2)

Radiological Safety

- The inspectors determined that the licensee continued to be effective in preventing the spread of contamination and in maintaining dose to workers well below the regulatory limits. (Section 2.1)
- The inspectors verified that the licensee maintained effluent releases well below the 10 CFR Part 20 release limits. The inspectors determined that no detectable licensed materials were found in the ground water around the perimeter of the plant. (Section 2.2)

Report Details¹

Summary of Plant Activities

During the inspection, the licensee was processing sodium removal from the primary sodium Loop 2.

1.0 Facility Management and Control

1.1 Self-Assessment, Auditing, and Corrective Action (40801)

a. Inspection Scope

The inspectors reviewed the licensee's activities associated with the identification and tracking of corrective actions and Review Committee (RC) commitments. The inspectors reviewed the licensee's Quality Assurance Conduct Manual, MQA11, Condition Assessment Resolution Document, Revision 25, dated August 13, 2008, and the Fermi 1 Manual, Revision 103T, Section 1.0, Administrative Controls, Section 1.1.10, Review Committee, and Section 1.22, Corrective Action Program, dated July 29, 2008. The inspectors also reviewed the RC minutes from meetings conducted on May 21 and 22, May 27, June 16, June 30, and July 16, 2008. The inspectors met with licensee personnel and reviewed and discussed the identification and disposition of items identified in the Condition Assessment Resolution Document (CARD) process.

b. Observations and Findings

The licensee's Review Committee is responsible for the review and approval of procedures for activities at the facility and for the issuance of Licensee Event Reports (LERs). In response to a May 20, 2008, sodium fire, the licensee implemented numerous responses and corrective actions, revised procedures, and issued an LER on June 19, 2008. A review of the RC meeting minutes following the fire indicated that the activities, procedures and LER were all reviewed and approved as required by the Review Committee. It was also noted that the RC meetings were well attended, typically with about twice the minimum required quorum of the Chairman and any four voting members, and with personnel from the appropriate organizational positions.

The licensee's CARD process was established to ensure "the timely identification, documentation, evaluation, classification, reporting, and resolving of Conditions Adverse to Quality." The inspector assessed the licensee's implementation of the CARD process by reviewing the response to the May 20 sodium fire, in which the licensee documented and followed up on the event under Corrective Action (CA) No. 08-23403. In reviewing documentation associated with CA No. 08-23403, it was determined that the event was documented in a timely manner, appropriate personnel were assigned the various response actions, the requisite management review was conducted, and corrective actions were completed in a timely manner. Initially the event was approved as a Level 2 CARD, but on May 23 it was raised to a Level 1 following the issuance of the LER as specified in Chapter 11 of the Quality Assurance Conduct Manual. A Level 1

¹A list of acronyms used and all documents reviewed in these "Details" are provided at the end of the report.

classification is defined as a Significant Condition Adverse to Quality and requires a root cause investigation to ensure corrective actions are adequate to prevent recurrence. The root cause investigation was initiated on May 27, 2008, and a final report issued on June 12, 2008. It was determined that the root cause team had a Team Leader who was a qualified Root Cause Evaluator, and the team was comprised of members who were knowledgeable of the subject matter being evaluated.

c. Conclusions

The inspectors determined that the Review Committee was meeting and carrying out its responsibilities as required, and the licensee was acceptably implementing its CARD process.

1.2 Licensee Event Report (LER) 08-001, Sodium Fire and Unplanned Release on May 20, 2008 (40801)

a. Inspection Scope

The inspectors reviewed the licensee's activities associated with a fire that occurred during sodium processing.

b. Observations and Findings

On May 20, 2008, while processing sodium in Primary Loop No. 3, licensee personnel detected a sodium fire at an apparent breach in a pipe. The sodium processing was stopped and the fire was extinguished in about ten minutes after the piping was inerted with nitrogen. An estimated 20 pounds of sodium burned in the incident, but no other combustibles were involved. Due to smoke and unknown radiological conditions, the licensee secured access to the Reactor Building and the Fuel and Repair Building (FARB). However, because an unplanned release of radioactive material occurred, an LER was required in accordance with Section A.4.a of the Fermi 1 Technical Specifications. The LER was submitted on June 19, 2008. Based on sample results the licensee conservatively estimated a total release of 16 μCi of cesium 137, for a calculated dose of $4.0 \text{ E-}6$ millirem to any individual at the site boundary.

The licensee conducted a root cause investigation to determine the cause of the unplanned release. The investigation identified two root causes and two contributing causes. The root causes were the failure to anticipate sodium overflowing into a 2-inch drain line and a failure to maintain the Reactor Building at a negative pressure. The contributing causes included a roof vent that was uncovered and unmonitored for airborne radioactivity, and that some of the Cs-137 combined with moisture in the air which allowed it to pass through the FARB HEPA filter.

The licensee determined that the overflow of sodium into the 2-inch drain line caused a blockage that resulted in a localized increase in temperature, which in conjunction with the caustic properties of the sodium caused a "chemical reaction ... resulting in pipe wastage to the point of failure."

Corrective actions by the licensee included reconfiguring the processing piping and adding heaters and thermocouples. A negative pressure was achieved in the Reactor Building by installing a temporary wall between the Reactor Building and FARB, and sealing up other penetrations where practicable. The roof vent was also sealed.

c. Conclusions

The inspectors determined that the licensee adequately evaluated the root causes of a May 20, 2008, pipe failure while processing sodium in Primary Loop No. 3, which resulted in a sodium fire. The corrective actions taken to prevent a recurrence of the pipe failure appeared adequate.

2.0 Radiological Safety

2.1 Occupational Radiation Exposure (83750)

a. Inspection Scope

The inspectors reviewed the results of air sampling, direct radiation surveys, and contamination surveys performed from April 2008 to August 2008, to determine whether the licensee adequately controlled doses to workers. The inspectors evaluated the dose to workers during the small sodium fire while processing sodium in Primary Loop 3.

b. Observations and Findings

The results of contamination surveys and direct radiation surveys from the work areas did not indicate any spread of contamination and any significant potential external exposure for the workers.

The sodium fire took place on May 20, 2008 and lasted for about 10 minutes. Based on the chart paper of AMS-3 beta air monitor, the duration of the radioactive release was about 2 hours after the fire began. The filter papers were sent to an off-site laboratory for 10 CFR Part 61 analysis and cesium-137 was the only isotope found. The inspectors performed independent dose assessment based on the sampling results from the AMS-3 and found the potential internal exposure would have been about 0.5 mrem if the workers had not evacuated the Reactor Building. The whole body count of the workers did not identify the positive intake of cesium-137.

c. Conclusions

The inspectors determined that the licensee continued to be effective in preventing the spread of contamination and in maintaining dose to workers well below the regulatory limits.

2.2 Radioactive Waste Treatment, Effluent and Environmental Monitoring (84750)

a. Inspection Scope

The inspectors reviewed the analytical data of gaseous effluent releases for particulates and tritium from April 2008 to June 2008 to verify that the licensee met 10 CFR Part 20 effluent release limits. The inspectors reviewed the routine semiannual data of groundwater samples taken during July 2008 from monitoring wells around the perimeter of the plant.

b. Observations and Findings

Air sampling at the effluence release points did not indicate any positive results from particulates and tritium, except during the week of the sodium fire. During the sodium fire, the release pathways identified were the roof vents from the Steam Generator building and Trestleway, and HEPA exhaust system from Fuel Repair Building. There were no releases from the HEPA exhaust system from Reactor Building. The inspectors assessed the unmonitored effluent releases from the roof vents based on the air sampling results of AMS-3 from the Fuel Repair building and grab sampling in the Steam Generator building. The inspectors' conservative dose assessment of the effluent releases was in agreement with the licensee's. The total release of cesium-137 was about 16 microcuries and the associated dose to the general public was about 4.0 E-6 mrem.

The groundwater sampling results from the monitoring wells showed only natural background activities.

c. Conclusions

The inspectors verified that the licensee maintained effluent releases well below the 10 CFR Part 20 release limits. The inspectors determined that no detectable licensed materials were found in the ground water around the perimeter of the plant.

3.0 **Exit Meeting**

The inspectors presented the inspection results to members of the licensee's staff at the conclusion of the inspection on August 28, 2008. The licensee did not identify any of the documents or processes reviewed by the inspector as proprietary.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

- * L. Goodman, Manager, Fermi 1 (Custodian)
- * K. Lindsey, Radiation Protection Supervisor
- * T. Brown, Manager, Radiation Protection
 - D. Breiding, Fermi 1 Project Coordinator
 - D. Swindle, Sodium Project Manager
- * C. Aldridge-Nunn, Office Administration
- * L. Davis, Office Specialist

* Present at the August 28, 2008, exit meeting.

LIST OF PROCEDURES USED

- IP 83750: Occupational Radiation Exposure
- IP 84750: Radioactive Waste Treatment and Effluent and Environmental Monitoring
- IP 40801: Self-Assessment, Auditing, and Corrective Action

LIST OF ACRONYMS USED

- ADAMS Agency Document and Management System
- CFR Code of Federal Regulations
- CA Corrective Action
- CARD Condition Assessment Resolution Document
- DOT Department of Transportation
- DNMS Division of Nuclear Materials Safety
- FARB Fuel and Repair Building
- HEPA High Efficiency Particulate Air Filter
- LER Licensee Event Report
- NRC Nuclear Regulatory Commission
- PARS Publicly Available Records
- RC Review Committee

ITEMS OPENED, CLOSED, AND DISCUSSED

None

LICENSEE DOCUMENTS REVIEWED

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the "Report Details" above.