



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

December 30, 2011

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

SUBJECT: NRC INSPECTION REPORT 05000016/11-13(DNMS) - ENRICO
FERMI UNIT 1

Dear Mr. Plona:

On December 11, 2011, 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. At the conclusion of the inspection on December 11, 2011, 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 included facility management and control and radiological safety. 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 Title 10 of the Code of Federal Regulations (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 NRC's Agencywide Document Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

J. Plona

-2-

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

Sincerely,

/RA/

Christine A. Lipa, Chief
Materials Control, ISFSI, and
Decommissioning Branch

Docket No. 050-00016

License No. DPR-9

Enclosure:

Inspection Report No. 05000016/11-13(DNMS)

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*See previous concurrence

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.: 050-00016

License No.: DPR-9

Report No.: 05000016/11-13(DNMS)

Licensee: Detroit Edison Company

Facility: Enrico Fermi Unit 1

Location: 6400 North Dixie Highway
Newport, MI 48166

Inspection Dates: June 7, 2011
August 3 through 4, 2011
October 22 through 23, 2011
December 11, 2011

Inspectors: Peter J. Lee, Ph.D., CHP
Katherine Streit, Health Physicist

Approved by: Christine A. Lipa, Chief
Materials Control, ISFSI, and
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Enrico Fermi Unit 1 NRC Inspection Report 05000016/11-13(DNMS)

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

Facility Management and Control

- The inspector concluded that the conditions of the facility and equipment were adequate and capable of supporting the decommissioning activities. (Section 1.1)
- The inspector determined that the licensee maintained adequate staffing levels and training to continue the decommissioning process. (Section 1.2)
- The inspector determined that the licensee's process for evaluating the safety impacts of facility changes was in compliance with the requirements of Title 10 Code of Federal Regulations (CFR) Part 50.59. (Section 1.3)
- The inspector determined that the licensee adequately implemented audits of the radiation protection program in accordance with its Quality Assurance Program. (Section 1.4)

Radiological Safety

- The inspector determined that the licensee continued to be effective in maintaining dose to workers below the regulatory limits. (Section 2.1)
- The inspector determined that the licensee had complied with the U.S. Nuclear Regulatory Commission (NRC) and Department of Transportation regulations for shipments of radioactive waste. The inspector determined that the licensee adequately addressed the hazards and protective measures during the movements of the transition deck and lower reactor vessel. (Section 2.2)

Final Status Survey

- The inspector determined that the licensee conducted work in accordance with the survey plan and no radionuclides of concern were identified. (Section 3.0)

Report Details¹

Summary of Plant Activities

During the inspection period, the licensee was continuing decommissioning activities and implementing the reactor vessel removal project.

1.0 Facility Management and Control

1.1 Decommissioning Performance and Status Review at Permanently Shut Down Reactors

a. Inspection Scope (71801)

The inspector toured the plant to assess working conditions and the status of decommissioning activities.

b. Observations and Findings

During the inspection contract workers were preparing to rig and lift the reactor vessel transition deck to the operating floor and into shielded Sealand containers for transportation to the rail spur. The inspector observed activities related to rigging, lifting, and placement of these large components into gondola cars for shipment. Workers wore appropriate protective equipment and followed established procedures. The licensee maintained the work location with adequate shielding, personnel barriers, and high efficiency particulate air (HEPA) filter exhaust systems, all to minimize worker doses. All radiological areas were adequately marked and posted.

c. Conclusions

The inspector concluded that the conditions of the facility and equipment were adequate and capable of supporting the decommissioning activities.

1.2 Organization, Management and Cost Controls (36801)

a. Inspection Scope

The inspector evaluated the licensee's decommissioning staffing to determine whether the licensee maintained adequate staffing levels to effectively conduct its decommissioning activities. The inspector reviewed records of the required training for licensee personnel and contractor workers.

b. Observations and Findings

The licensee conducted training for site personnel and contractor workers in accordance with the provisions of the licensee's training program. The training included radiation protection, sodium handling safety, asbestos awareness, and confined space safety.

c. Conclusions

The inspector determined that the licensee maintained adequate staffing levels and training to continue the decommissioning process.

1.3 Safety Reviews, Design Changes, and Modifications (IP 37801)

a. Inspection Scope

The inspector reviewed the licensee's safety screening reviews to verify that completed reviews were consistent with the requirements of 10 CFR Part 50.59. The review included selected screening reviews for the cutting up of the reactor vessel.

b. Observations and Findings

The licensee's Administrative Controls and Surveillance Procedures Manual, Section 1.6 was consistent with the NRC's requirements for 10 CFR Part 50.59 screening reviews. The licensee conducted several safety screening reviews of facility changes based on the work requests. The activities all involved facility changes that did not adversely affect the design functions of the structures, systems, and components (SSCs) as described in the licensee's Decommissioning Plan and none of the facility changes required a formal 10 CFR Part 50.59 safety evaluation.

c. Conclusions

The inspector determined that the licensee's process for evaluating the safety impacts of facility changes was in compliance with the requirements of 10 CFR Part 50.59.

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

a. Inspection Scope

The inspector reviewed the licensee's audit of its radiation protection program (Audit 11-0112) conducted from September 12 through September 23, 2011. Selected corrective action work orders associated with identified deficiencies were also reviewed.

b. Observations and Findings

The audit of the radiation protection program (Audit 11-0112) was appropriately focused in both scope and level of detail, and the licensee initiated appropriate corrective actions to resolve the audit findings.

c. Conclusions

The inspector determined that the licensee adequately implemented audits of the radiation protection program in accordance with its Quality Assurance Program.

2.0 Radiological Safety

2.1 Occupational Radiation Exposure (83750)

a. Inspection Scope

The inspector observed an as low as reasonably achievable (ALARA) sub-committee meeting and reviewed the work request and ALARA reviews for transition deck and lower reactor vessel rigging and movement to rail spur to evaluate the effectiveness of licensee controls to minimize the potential radiation exposure to the workers. The inspector also observed several licensee pre-job briefings to assess performance and the quality of the licensee's planning. The inspector reviewed the worker exposure records during 2011.

b. Observations and Findings

The ALARA sub-committee thoroughly discussed the issue of effectiveness of radiological controls and ensured all the questions and concerns were adequately addressed before approving the activity. The ALARA reviews were effective in minimizing unnecessary doses. The pre-job briefings were well attended, addressed all areas of the work to be performed, including safety issues, radiological controls, work sequence, hold points, and emergency contingencies.

The dose received from removing and transporting the transition deck and lower reactor vessel to the rail spur during 2011, was about 28,726 millirem (mrem). The highest dose received by an individual worker was about 1676 mrem. Dose extensions were approved by the licensee to allow seven contractor workers performing reactor segmentation to exceed the 1000 mrem/year administrative limit in 2011, but not exceed 2000 mrem after considerable evaluation and review in accordance with the licensee's site procedures.

The reactor cutting was performed from July 2010 to July 2011 using a mechanical saw and diamond wire. The dose increased as the work progressed lower in the reactor vessel and the majority of the dose received during 2011 was related to cutting the transition deck using diamond wire. The transition deck is the portion of the reactor vessel that connects the larger diameter upper reactor vessel to the lower reactor vessel. During operations, fuel was moved from the lower reactor vessel to the transfer rotor through the transition deck. The fuel handling mechanism and control rod drive mechanism were in the upper reactor vessel. The fuel and blanket material were in the lower reactor vessel. The highest dose rate on the reactor vessel was near the transition deck. Diamond wire was used to cut the transition deck away from the top portion of the lower reactor vessel, which it surrounded. This was the first time diamond wire was used to cut a reactor transition deck containing multiple shield plate layers which were difficult to cut. Interventions to adjust the pulleys and wire were greater than anticipated. Multiple ALARA activities were implemented, such as modifying the cutting technique and adding shielding on top of the lower reactor vessel. As the transition deck cutting continued, the time and dose to each of the similar cuts was reduced. Some additional experienced personnel were brought in as the activity progressed to keep the dose to the workers ALARA. The dose extensions were approved since limited

personnel experienced in diamond wire cutting using the specialized equipment, were available, and skilled personnel spend less time in the area to perform activities.

c. Conclusions

The inspector determined that the licensee continued to be effective in maintaining dose to workers below the regulatory limits.

2.2 Transportation of Radioactive Materials (86750)

a. Inspection Scope

The inspector reviewed the characterization survey of the transition deck after being lifted to the Reactor Building operating floor and placed into the shielded Sealand container, to ensure the dose rates met the shielded Sealand design bases. The inspector also reviewed the characterization survey of the lower reactor vessel, to ensure the dose rates met the shipping container designed bases. The inspector observed transporting the Sealand to the rail spur and placing it into the Gondola. The inspector also observed transporting the lower reactor vessel to the rail spur and placing it on the rail car. The inspector reviewed the characterization and classification reports of transition deck and lower reactor vessel.

b. Observations and Findings

The dose rates on contact of the transition deck and one foot from the Sealand were within the limits of the shielded Sealand design bases and the transition deck was determined to be acceptable for transportation to rail spur and placed into the Gondola. The dose rate of the lower reactor vessel was below the limits of its shipping container design basis.

The licensee transported the transition deck and lower reactor vessel in accordance with the instructions stated in the work request. The work group stopped and assessed the job site conditions and hazards prior to proceeding with a different phase of the task, and ensured everyone was aligned for the task to be performed.

The licensee's contractor calculated the activity of Co-60 based on the licensee's characterization survey report of the transition deck. The remaining activation product activity of the transition deck was calculated using scaling factors developed based on the activation analysis of the reactor vessel performed in 2001. The licensee calculated the activity of the lower reactor vessel based on the activation analysis of reactor vessel performed in 2001. The review of characterization and classification reports indicated that the transition deck and lower reactor vessel are NRC Class A waste and a Department of Transportation (DOT) Type A quantity of LSA-II material.

The licensee verified that the results of radiation and removable contamination levels of the shipping containers were within applicable limits.

c. Conclusions

The inspector determined that the licensee had complied with NRC and DOT regulations for shipments of radioactive waste. The inspector determined that the licensee adequately addressed the hazards and protective measures during the movement of transition deck and lower reactor vessel.

3.0 Final Status Surveys (83801)

a. Inspection Scope

The inspector observed the collection of five surface soil samples from the lower part of the Fuel and Repair Building driveway on the corner of the Fermi 1 footprint following the removal of the asphalt parking lot. The inspector reviewed the final status survey procedure entitled, "Area Surveillance Survey Plan," reference number EF1-FSSP-OOL01-01-00. The inspector observed the radiological scan survey over the area, the collection and handling of soil samples, and reviewed the licensee's chain of custody. The inspector collected five split samples to determine the adequacy and accuracy of the licensee's procedures and analytical results.

b. Observations and Findings

The licensee conducted the radiological scan survey and collection of the soil samples in accordance with their final status survey procedure and with calibrated instruments. The licensee collected the surface soil samples in accordance with their procedure and to a depth of approximately 15 centimeters. The licensee collected the five samples in the locations as designated in their final status survey procedure.

The inspector sent five split samples to Oak Ridge Institute for Science and Education (ORISE) for sample analysis. The results (see ADAMS ML 112150482) indicated that no radionuclides of concern (ROC) were identified and the minimum detectable concentrations of ROC were well below the licensee's derived concentration guideline limits. The results were agreeable with the licensee's results.

c. Conclusions

The inspector determined that the licensee conducted work in accordance with the survey plan and no radionuclides of concern were identified.

4.0 Exit Meeting

The inspector presented the inspection results to members of the licensee's staff at the conclusion of the inspection on December 11, 2011. The licensee did not identify any of the documents or processes reviewed by the inspector as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

* L. Goodman, Manager, Fermi 1
C. Becker, Project Manager
W. Colonnello, Director, Nuclear Support, Fermi 1
D. Randall, License Termination Manager
D. Kejkitalo, Radiation Protection Supervisor
D. Breiding, Reactor Project Manager
D. Swindle, Sodium Project Manager
C. Aldridge-Nunn, Office Administration
D. Mihalik, FSS Engineer

* Present at the December 11, 2011, exit meeting.

LIST OF PROCEDURES USED

IP 83750: Occupational Radiation Exposure
IP 36801: Organization, Management and Cost Controls
IP 37801: Safety Reviews, Design Changes, and Modifications
IP 40801: Self-Assessment, Auditing, and Corrective Action
IP 83801: Final Status Survey
IP 86750: Transportation of Radioactive Materials
IP 71801: Decommissioning Performance and Status Review at Permanently Shut Down Reactors

LIST OF ACRONYMS USED

ADAMS Agency Document and Management System
ALARA A Low As Reasonably Achievable
CFR Code of Federal Regulations
ORISE Oak Ridge Institute for Science and Education
DOT Department of Transportation
DNMS Division of Nuclear Materials Safety
LSA Low Specific Activity
NRC U.S. Nuclear Regulatory Commission
ROC Radionuclides of Concern
HEPA High Efficiency Particulate Air

LICENSEE DOCUMENTS REVIEWED

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

SUPPLEMENTAL INFORMATION (Continued)

ITEMS OPENED, CLOSED, AND DISCUSSED

None