December 27, 2006

Dr. Terrance G. Alexander, Director OSEH
Phoenix Memorial Laboratory
Ford Nuclear Reactor
University of Michigan
2301 Bonisteel Boulevard
Ann Arbor, MI 48109-2100

SUBJECT: FORD NUCLEAR REACTOR INSPECTION REPORT 050-00002/06-01(DNMS)

Dear Dr. Alexander:

On October 19 and November 28 and 29, 2006, the NRC completed inspection activities at the Ford Nuclear Reactor. The purpose of the October 19 inspection was to follow up on an incident in which personnel at an operating nuclear power plant determined that a contract employee was contaminated with radioactive material that may have originated at the Ford Nuclear Reactor. The November 28 and 29 inspection was a routine inspection to evaluate the current status of decommissioning activities. At the conclusion of on-site inspections on October 19 and November 29, the inspectors discussed the inspection findings with members of your staff.

This inspection consisted of an examination of decommissioning activities at the Ford Nuclear Reactor as they relate to safety and compliance with the Commissions rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection included a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC did not identify any violations. The inspectors were not able to determine with any certainty whether the radioactive contamination identified on the former contract employee originated at the Ford Nuclear Reactor.

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 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.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Decommissioning Branch

Docket No. 50-02
License No. R-28

Enclosure:
NRC Inspection Report 050-00002/06-01(DNMS)

cc w/encl: C. W. Becker, University of Michigan
State of Michigan

DISTRIBUTION w/encl:
Docket File
K. Banovak, NMSS
G. Grant, RIII
S. Reynolds, RIII
RIII PRR

DOCUMENT NAME:C:\FileNet\ML063610459.wpd
■ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ■ Non-Sensitive
To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

OFFICE	RIII:DNMS	E	RIII:DNMS		RIII:DNMS		RIII:DNMS	
NAME	WGSnell:mb by JLC for		SJMulay		PJLee by JLC for		JLCameron	
DATE	12/27/06		12/26/06		12/26/06		12/27/06	

OFFICIAL RECORD COPY

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	050-00002
License No:	R-28
Report No:	050-00002/06-01(DNMS)
Licensee:	University of Michigan
Facility:	Ford Nuclear Reactor
Location:	Ann Arbor, Michigan
Dates:	October 19, 2006, and November 28 and 29, 2006
Inspectors:	William Snell, Senior Health Physicist Dr. Peter Lee, CHP, Health Physicist Sam J. Mulay, Health Physicist
Approved by:	Jamnes L. Cameron, Chief Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

University of Michigan
Ford Nuclear Reactor
NRC Inspection Report 050-00002/06-01(DNMS)

These inspection activities included a follow up on an incident in which a former employee was identified with contamination that may have originated at the Ford Nuclear Reactor, and a routine inspection to evaluate the current status of decommissioning activities. During the inspection the inspectors toured the reactor building, discussed the status of the decommissioning activities with licensee personnel, and examined licensee records and procedures.

Contamination Control and Monitoring

- The licensee employed adequate procedures and practices for contamination control and monitoring workers for contamination at the Ford Nuclear Reactor Decommissioning Project. The inspectors were not able to determine with any certainty whether the contamination identified on the former contract employee originated at the Ford Nuclear Reactor. (Section 1.0)

Radiation Protection

- The licensee's decommissioning radiation protection program was effective in controlling contamination and radioactive materials, ensuring personnel were trained, ensuring radioactive waste shipments were appropriately conducted, and effluent releases were carried out in accordance with 10 CFR Part 20 requirements. (Section 2.0)

Report Details[1]

1.0 Contamination Control and Monitoring (69013)

1.1 Inspection Scope

The inspectors evaluated the licensee's procedures and practices for contamination control and the monitoring of workers for contamination associated with decommissioning activities at the Ford Nuclear Reactor. The inspectors toured the facility to observe the existing monitoring and survey equipment and assess the licensee's contamination control zones. The inspectors also reviewed procedure HP-305, "Monitoring and Control of Personnel Contamination," Revision 0, dated June 27, 2006.

1.2 Observations and Findings

On October 12, 2006, the Radiation Protection Manager at an operating nuclear power reactor contacted the University of Michigan's Radiation Safety Officer to inform him that a contract worker, who indicated that he had recently worked at the Ford Nuclear Reactor, was identified with radioactive contamination while exiting the site through a portal monitor. Further monitoring identified contamination on the individual's shoe, lanyard, pants, and safety glasses, all of which appeared to be fixed. Using handheld frisker probes, personnel at the operating power reactor identified 1,000 counts per minute (cpm) on a shoe and 700 cpm on the lower portion of the pants. Further analysis using a SAM-9 surface area monitor identified approximately 94,000 disintegrations per minute (dpm) on both shoes and 22,000 dpm on the blue jeans. A gamma spectroscopic analysis identified isotopes as cobalt-60, zinc-65, silver-108m, and silver-110m, which did not match the isotopic mix of nuclides usually identified at the operating power reactor site. In addition, the individual had just arrived at site and site personnel indicated that he had only worked on the turbine deck, an area which was normally free of radioactive contamination. Since the individual's previous location of work was at the Ford Nuclear Reactor, personnel at the operating power reactor surmised that the contamination may have originated there.

At the Ford Nuclear Reactor decommissioning project, the licensee had identified three physical zones within the building, based on the potential for contamination (highest potential, lowest potential, and non-contaminated), and required a manual frisk of the hands and feet when moving from a zone with a higher potential for contamination to a zone with a lower potential for contamination. Therefore, if someone entered the zone of highest potential for contamination, they would have to perform two manual frisks before leaving the building. That is, perform one frisk when leaving the zone of highest potential and entering the zone of lowest potential, and another when leaving the zone of lowest potential and entering the clean areas of the building. In addition, the licensee required the use of a hand/foot monitor prior to leaving the reactor building and again prior to leaving the Phoenix Memorial Building which housed the Ford Reactor.

[1]A list of acronyms used in the report is included at the end of the Report Details.

During calendar year 2006, the licensee had documented only one previous recordable contamination event and that was only slightly above the licensee's recordable level. In that event, the contamination was identified prior to the individual leaving the contaminated zones.

As of this inspection, the licensee was not able to retrieve the contaminated items from the operating power reactor for its analysis. Without having access to the articles in question, the licensee was not able to determine whether its survey instruments would have identified the contamination. Based on the licensee's discussion with the contract worker after the contamination was identified and based on his work performance, the licensee was not able to identify any deficiencies in his manual frisking technique. Furthermore, the worker received a whole-body count when he ended employment at the Ford Nuclear Reactor and personnel at the operating power reactor indicated that he received a whole-body count when he started work at that site. The worker further indicated he wore the pants and shoes that were later identified as contaminated during the entrance whole-body count at the operating power reactor. Neither the exit whole-body count from the Ford Nuclear Reactor, nor the entrance count at the operating power reactor identified any contamination above minimum detectable activities. The worker also stated he never wore the pants that were identified with contamination while working at the Ford Nuclear Reactor, and had washed the jeans prior to arriving at the operating power reactor.

According to the licensee, personnel from the operating power reactor stated that surveys on the turbine deck where the individual had worked, as well as in the worker's vehicle, did not identify any contamination. The worker also stated that the shoes identified with contamination had been worn at other nuclear power plants. Based on the available information, the licensee was not able to determine whether the contamination originated at the Ford Nuclear Reactor, some other facility, or from a combination of facilities. That determination notwithstanding, the licensee took immediate actions to assess its contamination control and personnel monitoring programs to ensure they were adequate. As a result of the review, the licensee changed one of the monitoring locations from a manual frisking station to a hand and foot monitor. In addition, workers were retrained on the appropriate frisking procedures and monitoring requirements.

1.3 Conclusion

The licensee employed adequate procedures and practices for contamination control and monitoring workers for contamination at the Ford Nuclear Reactor. The inspectors were not able to determine with any certainty whether the contamination identified on the former contract employee originated at the Ford Nuclear Reactor.

2.0 Research and Test Reactor Decommissioning (69013)

2.1 Inspection Scope

The inspectors interviewed licensee personnel, reviewed records and procedures, and toured the nuclear reactor facilities, to assess the decommissioning radiation protection program. Aspects of the licensee's program reviewed included laboratory analyses, analytical and quality assurance/quality checking (QA/QC) procedures for the

germanium detector, liquid scintillation detector, and gas proportional detector, the shipment of a Type B cask, and the planned release of pool water to the sanitary sewer.

2.2 Observations and Findings

The laboratory instrumentation was appropriate for the analyses being performed. The licensee employed sound QA/QC procedures and laboratory personnel were knowledgeable about and proficient in their laboratory responsibilities.

The inspectors reviewed the licensee's activities involving the planned release of the reactor pool water to the sanitary sewer system. The licensee coordinated the release with officials with the City of Ann Arbor, and the inspectors verified through a review of gamma spectrum analyses of some of the pool water samples that the release would meet the effluent release requirements of 10 CFR Part 20. To ensure that the water met the solubility criteria, the licensee filtered the water consistent with NRC Information Notice 94-07, "Solubility Criteria for Liquid Effluent Releases to Sanitary Sewerage Under the Revised 10 CFR Part 20." The inspectors reviewed the filtration system, and verified the licensee had installed filtration with a pore size of less than 0.45 microns.

During the tour of the facilities, the inspectors observed that step off pads were appropriately placed, friskers and other survey and monitoring instrumentation were all within current calibration dates, postings and boundaries were adequate and appropriate, and contaminated material was being controlled. The inspectors reviewed the external dosimetry results for decommissioning workers for the 1st, 2nd, and 3rd quarters of 2006, and identified no concerns related to personnel dose. The inspectors also reviewed procedures, records, and training materials, from the licensee's training program for licensee personnel and contract workers. The training program was noted to be broad in scope and well documented. No concerns were identified with the training program. A sampling of survey records were reviewed for the reactor pool floor and the beam port floor. The surveys adequately characterized radiological conditions, were legible, and appropriately signed. No concerns were identified with the survey records.

The inspectors reviewed and discussed with licensee personnel, the loading activities and records involving the shipment of a Type B cask (CNS8-120B) for disposal. The shipment contained 2.35E+5 millicuries of primarily cobalt-60, iron-55 and nickle-63. The licensee had extensive documentation, including photographs, that documented all aspects of the preparation and loading of the shipment. The inspectors also reviewed the licensee's QA Program procedure, "Packaging and Transportation of Radioactive Material," Revision 4, dated August 30, 2005. The QA Plan required an annual audit of activities under the Plan as required by 10 CFR 71.137. A draft audit was available and reviewed by the inspectors which covered the licensee's transportation activities, including the cask shipment. No issues were identified with the transportation audit, cask loading or shipment.

2.3 Conclusion

The licensee's decommissioning radiation protection program was effective in controlling contamination and radioactive materials, ensuring personnel were trained, ensuring radioactive waste shipments were appropriately conducted, and effluent releases were carried out in accordance with 10 CFR Part 20 requirements.

3.0 Exit Meeting Summary

The inspectors presented preliminary inspection findings to members of the licensee management team at the conclusion of onsite inspection activities on October 19 and November 29, 2006.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*C. Becker, Ford Nuclear Reactor Manager
M. Driscoll, Director, Radiation Safety

*Persons present at the exit meetings on October 19 and November 29, 2006.

INSPECTION PROCEDURES USED

IP 69013 Research and Test Reactor Decommissioning

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	None
Closed	None
Discussed	None

PARTIAL LIST OF DOCUMENTS REVIEWED

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

LIST OF ACRONYMS USED

cpm	Counts per minute
CFR	Code of Federal Regulations
dpm	disintegrations per minute
HP	Health Physics
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
QA	Quality Assurance
QC	Quality Check

Mr. C. W. Becker
Phoenix Memorial Laboratory
2301 Bonisteel Boulevard
University of Michigan
Ann Arbor, MI 48109-2100

Radiological Protection and Medical Waste Section
Waste and Hazardous Materials Division
Michigan Department of Environmental Quality
525 W. Allegan Street
P.O. Box 30241
Lansing, MI 48909-7741