

October 24, 2011

Mr. Terry Alexander, Executive Director
Department of Occupation Safety & Environmental Health
1239 Kipke Drive
University of Michigan
Ann Arbor, MI 48109-1010

SUBJECT: NRC INSPECTION REPORT 050-00002/11-001(DNMS) – FORD NUCLEAR
REACTOR AND NOTICE OF VIOLATION

Dear Mr. Alexander:

On October 12, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed inspection activities at the Ford Nuclear Reactor, Ann Arbor, MI. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with the NRC requirements. Specifically, during an on-site inspection on August 9 through 11, 2011, and subsequent in-office review through October 12, 2011, the inspector evaluated decommissioning performance and conducted independent radiation surveys and soil sampling, with soil sample evaluation of the NRC samples by the Oak Ridge Institute for Science and Education (ORISE). At the conclusion of the on-site inspection, the inspector discussed the interim inspection results with members of your staff. A final report from ORISE of the results of the soil sample analysis was provided to the NRC on August 30, 2011. At the conclusion of the in-office review, a final telephone exit meeting was conducted on October 12, 2011, to discuss the final results 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 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, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>.

The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. If you have additional information that you believe the NRC should

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consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, Proprietary, or safeguards information so that it can be made available to the public without redaction.

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

Sincerely,

/RA/

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

Docket No. 50-002
License No. R-28

Enclosures:

1. Notice of Violation
2. NRC Inspection Report No. 050-00002/11-001(DNMS)

cc w/encls: S. L. Ceccio, University of Michigan
M. Driscoll, University of Michigan
K. Yale, State of Michigan

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Christine A. Lipa, Chief
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cc w/encls: S. L. Ceccio, University of Michigan
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NOTICE OF VIOLATION

University of Michigan
Ann Arbor, Michigan

Docket No. 050-00002
License No. R-28

During an U.S. Nuclear Regulatory Commission (NRC) inspection conducted between July 9 and October 12, 2011, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Technical Specification 6.3 requires, in part, that decommissioning operations are independently monitored or audited to ensure they are being performed safely and in accordance with all applicable licenses and registrations held by the University and in compliance with applicable federal and state regulatory requirements; the quality assurance is independently monitored or audited to verify that performance criteria are met as well as to determine the effectiveness of the program in satisfying the quality assurance requirements; and monitoring or audits shall be performed annually, at a minimum.

Contrary to the above, from 2009 until 2011, the licensee has not independently monitored or audited either decommissioning operations or the quality assurance program annually as required.

This is a Severity Level IV violation.

Pursuant to the provisions of Title 10 of the Code of Federal Regulations 2.201, the University of Michigan is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, Proprietary, or safeguards information so that it can be made available to the public without redaction.

Notice of Violation

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If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 24TH day of October 2011.

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No. 050-00002

License No. R-28

Report No. 050-00002/11-001(DNMS)

Licensee: University of Michigan

Facility: Ford Nuclear Reactor

Location: Ann Arbor, Michigan

Dates: August 9 – 11, 2011 (on-site)
through October 12, 2011 (in-office review)

NRC Inspector: Jeremy Tapp, Health Physicist

NRC Observers: Theodore Smith, Project Manager, FSME
Stephen Giebel, Health Physicist, FSME
Nicholas Hansing, Student Engineer, RIII

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

EXECUTIVE SUMMARY
University of Michigan – Ford Nuclear Reactor
Inspection Report 050-00002/11-001(DNMS)

This routine decommissioning inspection included a review of the licensee's current performance related to decommissioning activities, and the performance of radiation surveys and collection of soil samples. Areas reviewed included health physics and audits and reviews.

Research and Test Reactor Decommissioning

- Inspector observations of the facility determined that facility radiological and industrial controls ensured worker safety and prevented loose radiological contamination in uncontrolled areas. Instruments were adequately tested before use to demonstrate functionality and calibrated as required by the applicable procedure. The licensee took appropriate actions when radiation survey results did not compare as expected (Section 1.1).
- The annual Report on Reactor Operations was completed as required and comprehensive in content. Decommissioning Review Committee (DRC) meetings were conducted semi-annually with more than the required attendance, and discussed all current decommissioning activities. A Technical Specification violation was identified for not performing the required annual independent monitoring or audit of both decommissioning operations and quality assurance (Section 1.2).

Report Details

1.0 Research and Test Reactor Decommissioning (69013)

1.1 Health Physics

a. Inspection Scope

The inspector interviewed site personnel and performed a facility and site tour to observe field conditions. The inspector evaluated the site's material condition and housekeeping, area radiological conditions, and radiological access control and associated posting/labeling. Independent radiation measurements were made throughout the areas toured and compared to the licensee's postings. In addition, the inspector reviewed a sampling of routine contamination smear survey records from 2011 to evaluate whether the licensee's radioactive material controls were adequate.

The inspector reviewed the licensee's radiological survey instrumentation by observing licensee personnel perform instrument and detector calibration and daily source check activities. The inspector verified the activities were performed in accordance with the required procedures, specifically HP-402, "Calibration of the Ludlum 2221 Scaler Ratemeter & Detectors," Revision 0, and HP-401, "Survey Instrument Source Checking," Revision 0. The inspector also reviewed calibration records for a Ludlum 44-142 Probe # PR246233, completed on March 14, 2011, and a Ludlum 2221 Scaler Ratemeter # 216469, completed on June 30, 2011, to determine if they were calibrated as required by procedure.

The inspector performed independent radiation surveys and soil sampling in a cavity along the Ford Nuclear Reactor (FNR) and Phoenix Memorial Laboratory (PML) wall. Beta surveys were performed on the concrete surfaces of the cavity along with the collection of three soil samples. The beta survey results were compared to the licensee's to confirm the validity of their results. The three soil samples were sent to the Oak Ridge Institute for Science and Education (ORISE) for analysis of Co-60, Cs-137, and Ag-108m. The inspector reviewed the results and will potentially use them in the future to support license termination, once derived concentration guideline levels (DCGLs) are approved for the FNR.

b. Observations and Findings

The inspector found that the facility was generally clean and free of debris and personnel hazards. Access control and postings were determined to be adequate for the radiological conditions of the facility. All routine contamination smear survey results showed no discernable loose contamination in the building. Health Physics staff used appropriate radiation sources and methods in accordance with their procedures to source check each instrument and applicable detector each day it was to be used and to calibrate each detector as required. Health Physics staff was knowledgeable of the calibration and source check process and procedures.

During radiation surveys of the cavity along the FNR and PML wall, the inspector found most direct beta measurements to be in agreement with the licensee's results, which are found in Survey No. 2011-0033, dated April 20, 2011, and Survey No. 2011-0022, dated

March 29, 2011. But some results were approximately two times those recorded by the licensee. These results were passed along to the licensee, and subsequently, they discussed with the inspector plans to follow up and perform additional surveys. Because DCGLs for building surfaces have not been approved for the decommissioning of the FNR by the NRC, no comparison was made at this time between these survey results and their acceptability for supporting final license termination.

In addition, three soil samples were obtained from the cavity, two from the west section and one from the east section. The soil was collected from the top 6 inches next to the FNR and PML wall, where the potential for the highest level of contamination is located. The three samples were sent to ORISE and the final results were provided to the NRC in the document, "Letter Report for Analytical Results for Three Soil Samples from the University of Michigan Ford Reactor, Ann Arbor, Michigan," dated August 23, 2011 (ML112420852). The inspector reviewed the results and determined them to be reasonable compared to the licensee's initial results and subsequent remediation activities. Depending on the DCGLs that are approved in the future for this area, these results could be potentially used to support license termination.

No findings of significance were identified.

c. Conclusions

Inspector observations of the facility determined that facility radiological and industrial controls ensured worker safety and prevented loose radiological contamination in uncontrolled areas. Instruments were adequately tested before use to demonstrate functionality and calibrated as required by the applicable procedure. The licensee took appropriate actions when radiation survey results did not compare as expected.

1.2 Review and Audit

a. Inspection Scope

The inspector reviewed the licensee's annual Report on Reactor Operations to determine it was completed as required by Technical Specifications. The inspector reviewed Decommissioning Review Committee (DRC) meeting minutes from the previous two meetings on March 15, 2011 and September 27, 2010 to determine whether the committee performed its function as described in the Technical Specifications. The minutes reviewed also included minutes from the January 19, 2010 meeting. The inspector also reviewed independent audits required by Technical Specifications that were conducted in 2011 to determine the adequacy of their scope and evaluate the results.

b. Observations and Findings

The inspector found the Report on Reactor Operations was completed as required by Technical Specifications and the content reflected current licensee activities and status. The DRC met semi-annually as required, and a quorum existed in each meeting reviewed. The inspector found the DRC reviewed, in part, current decommissioning activities and a procedure change for soil sampling, as required by Technical Specifications.

The inspector requested the licensee to provide a copy of the independent audit or audits performed in 2011. The licensee could not provide any independent audit performed for 2011, as required by Technical Specifications. In addition, when the inspector requested the licensee provide the last independent audit performed, no audits could be found in the licensee's records. The inspector reviewed the DRC meeting minutes for 2010 and 2011 and found no mention of scheduling or reviewing independent monitoring or audits as required. A contractor for the licensee that performed Reactor Manager duties in the past was contacted by the licensee to determine when the last independent audit was performed. The licensee has verbally stated an independent audit was last performed in 2008.

Audits are required to be conducted to independently assess program performance and determine whether policies, procedures, and practices ensure health and safety. Audits are intended to identify flaws and prompt corrective action, which results in a substantial decrease in potential for significant issues to occur. Therefore, the failure to complete the required audits of decommissioning operations and quality assurance is of more than minor safety significance given the potential impact on overall program effectiveness. For example, radiation survey reports performed in the February to June 2011 timeframe did not receive a timely quality assurance review, which was for six months, in the most extreme case.

Technical Specification 6.3 states, in part, "the following are independently monitored or audited: a. Decommissioning operations to ensure they are being performed safely and in accordance with all applicable licenses and registrations held by the University and in compliance with applicable federal and state regulatory requirements. b. The quality assurance to verify that performance criteria are met as well as to determine the effectiveness of the program in satisfying the quality assurance requirements." In addition, Technical Specification 6.3 states, in part, "monitoring or audits shall be performed annually, at a minimum..." The failure to perform an annual independent audit, from 2009 until 2011, of both decommissioning operations and quality assurance, is a violation of Technical Specification 6.3. (VIO 05000002/11-01-01).

c. Conclusions

The annual Report on Reactor Operations was completed as required and comprehensive in content. DRC meetings were conducted semi-annually with more than the required attendance, and discussed all current decommissioning activities. A Technical Specification violation was identified for not performing the required annual independent monitoring or audit of both decommissioning operations and quality assurance.

2.0 **Exit Meeting Summary**

The inspector presented the interim inspection results to licensee management at the conclusion of the onsite inspection on August 11, 2011. After in-office review was completed on October 12, 2011, a final exit teleconference was held. The licensee acknowledged the results presented and did not identify any of the documents reviewed by the inspectors as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION
PARTIAL LIST OF PERSONS CONTACTED

Licensee

^{1,2}M. Driscoll, Radiation Safety Officer

^{1,2}R. Blackburn, Assistant Manager of Laboratory Operations

¹Indicates presence at the interim on-site exit meeting held on August 11, 2011.

²Indicates presence at the telephone exit meeting held on October 12, 2011.

LIST OF PROCEDURES USED

IP 69013 Research and Test Reactor Decommissioning

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	Type	Summary
VIO 05000002/11-01-01	VIO	Failed to perform independent monitoring or audits of decommissioning operations and quality assurance as required by Technical Specification 6.3
Closed	None	
Discussed	None	

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
DCGL	Derived Concentration Guideline Level
DNMS	Division of Nuclear Material Safety
DRC	Decommissioning Review Committee
FNR	Ford Nuclear Reactor
NRC	U. S. Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
PML	Phoenix Memorial Laboratory

DOCUMENTS REVIEWED

Licensee documents used during the inspection were specifically identified in the Report Details above.