

April 18, 2000

Dr. David B. Ashley, Director
Engineering Experiment Station
Ohio State University
167 Hitchcock Hall
Columbus, OH 43210

SUBJECT: NRC INSPECTION REPORT NO. 50-150/00-201 AND NOTICE OF VIOLATION

Dear Dr. Ashley:

This refers to the inspection conducted on March 20-23, 2000, at the Ohio State University Research Reactor facility. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

Various aspects of your safety program were inspected including selective examinations of procedures and representative records, and interviews with personnel. Based on the results of this inspection, certain of your activities appeared to be in violation of NRC requirements as specified in the enclosed Notice of Violation (Notice). The circumstances surrounding the apparent violation are described in detail in the subject inspection report.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response in accordance with its policies to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact Craig Bassett at 404-562-4712

Sincerely,

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-150
License No. R-75

Enclosures:

1. Notice of Violation
2. NRC Inspection Report No. 50-150/00-201

cc w/encl: Please see next page

Ohio State University

Docket No. 50-150

cc:

Ohio Department of Health
ATTN: Radiological Health Program Director
P. O. Box 118
Columbus, OH 43216

Ohio Environmental Protection Agency
Division of Planning
Environmental Assessment Section
P. O. Box 1049
Columbus, OH 43216

Mr. Richard D. Myser
Reactor Operations Manager
Engineering Experiment Station
Ohio State University
142 Hitchcock Hall
Columbus, OH 43210

Dr. William Vernetson
Director of Nuclear Facilities
202 New Science Center
Department of Nuclear
Engineering Science
University of Florida
Gainesville, FL 32611

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NOTICE OF VIOLATION

Ohio State University Research Reactor
Ohio State University

Docket No. 50-150
License No. R-75

During an NRC inspection conducted on March 20-23, 2000, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 71.5(a) requires that a licensee who delivers licensed material to a carrier for transport comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Parts 170-189.

49 CFR 171.2(a) prohibits any person from offering hazardous material for transportation unless, among other requirements, the hazardous material is properly classified, described, packaged, marked, labeled, and in condition for shipment required or authorized under the Hazardous Material Regulations (49 CFR 171-177).

49 CFR 172.202(a)(5) requires that the total quantity (by net or gross mass, capacity, or as appropriate) of material being shipped, including the unit of measurement, be included on the shipping papers.

49 CFR 172.203(d)(3) requires that a description of the physical and chemical form of the material being shipped be included on the shipping papers.

49 CFR 172.203(d)(4) requires that the activity contained in each package of the shipment be listed on the shipping papers in terms of the appropriate SI units (e.g., Becquerel, Terabecquerel, etc.) or in terms of the appropriate SI units followed by the customary units (e.g., Curies, millicuries, etc.).

49 CFR 172.403(c) requires that the category of label applied to a package in the shipment with a Transport Index of greater than 1 but less than 10 be a Yellow III label.

49 CFR 172.504(a) requires that a transport vehicle containing any quantity of hazardous material bearing a Yellow III label be placarded with a RADIOACTIVE placard on each side and end of the vehicle.

Contrary to the above, several discrepancies were noted on the shipping papers prepared by the staff of the Nuclear Reactor Laboratory as follows:

1. Of the shipping papers of four shipments made to one organization during January and February 1999, at least one set or more did not list:
 - a. the total quantity of material being shipped,

- b. the chemical and physical form of the material being shipped, and
 - c. the activity in SI units.
2. The shipping papers for one shipment to the Cleveland Clinic on February 2, 1999, indicated that the package had been incorrectly labeled compared with the Transport Index listed (the shipment was labeled as a Yellow II when it should have been labeled a Yellow III). Consequently, the transport vehicle was not properly placarded as required.

This is a Severity Level IV violation (Supplement V).

Pursuant to the provisions of 10 CFR 2.201, Ohio State University is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the responsible inspector, U.S. Nuclear Regulatory Commission, Region II, 61 Forsyth St. S.W., Suite 23T85, Atlanta, GA 30303, within 30 days of the date of this 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, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, 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 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 to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be placed in the NRC Public Document room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. 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 or information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(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 are required to post this Notice within two working days.

Dated at Rockville, Maryland this

U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-150

License No: R-75

Report No: 50-150/00-201

Licensee: Ohio State University

Facility: Ohio State University Research Reactor

Location: Columbus, Ohio

Dates: March 20-23, 2000

Inspector: Craig Bassett

Approved by: Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of various aspects of the licensee's programs concerning radiation protection, security, and the transportation of radioactive materials as they relate to the licensee's five-hundred kilowatt (500 kW) Class II research reactor. The licensee's programs were directed toward the protection of public health and safety and were generally in compliance with NRC requirements. No safety concerns were identified.

Organization and Staffing

- The licensee's organization and staffing remain in compliance with the requirements specified in the Technical Specifications.

Review and Audit Functions

- Audits were being conducted by the Reactor Operations Committee in compliance with the requirements specified in the Technical Specifications.

Radiation Protection Program

- Surveys were being completed and documented acceptably to permit evaluation of the radiation hazards present.
- Postings and notices met the regulatory requirements.
- Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and the NRC's regulatory limits.
- Radiation monitoring equipment was being maintained and calibrated as required.
- The Radiation Protection and ALARA Programs satisfied regulatory requirements.
- Radioactive effluents from the facility were monitored as required.

Transportation of Radioactive Materials

- One violation was noted for failure to include all the required information on the shipping papers and failure to properly label one shipment.

Safeguards and Security

- The security program at the facility was acceptably carried out.

Material Control and Accountability

- No deficiencies were identified in the licensee's Material Control and Accounting program.

Report Details

Summary of Plant Status

The licensee's non-power reactor (NPR) continues to be operated at various power levels up to the maximum authorized level of 500 kW for neutron activation analysis, limited isotope production, physics experiments to support research, and testing. During this inspection the reactor was operated to perform fission chamber testing.

1. Organization, and Staffing (69001)

a. Inspection Scope

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of the Technical Specification (TS) were being met:

- organizational structure
- management responsibilities
- staffing requirements for the research reactor facility

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the facility had not changed since the previous NRC inspection in March 1999 (Inspection Report No. 50-150/99-201).

Through review of records and logs and through discussions with licensee personnel, the inspector determined that the staffing at the facility was acceptable to support the work and ongoing activities. The staffing met the requirements of the TS.

c. Conclusions

The licensee's organization and staffing remain in compliance with the requirements specified in the TS.

2. Review and Audit Functions (69001)

a. Inspection Scope

The inspector reviewed the following to ensure that the audits and reviews stipulated in the requirements of the TS were being completed:

- Reactor Operations Committee meeting minutes
- duties specified for the Reactor Operations Committee in the TS

b. Observations and Findings

The inspector reviewed the Reactor Operations Committee (ROC) meeting minutes from January 1998 to the present. These meeting minutes showed that the committee

met as required by the TS with a quorum being present. The inspector also noted that the ROC had considered the types of topics outlined by the TS.

It was noted that the ROC, or a designated representative, completed audits of the radiation protection and security programs as required by the TS. The inspector noted that the audits and the resulting findings were acceptable. If the findings contained recommendations for possible changes, the licensee responded and took corrective actions as necessary.

c. Conclusions

Audits were being conducted by the ROC according to the requirements specified in the TS.

3. Radiation Protection Program (69001)

a. Inspection Scope

The inspector reviewed the following to verify compliance with 10 CFR Part 20 and the applicable licensee TS requirements and procedures:

- health physics survey records
- radiological signs and posting
- dosimetry records
- calibration and periodic check records for radiation monitoring instruments
- the Radiation Protection Program
- the ALARA Program
- the 1998 and 1999 Annual Reports

The inspector also toured the licensee's facility and observed the use of dosimetry and radiation monitoring equipment. Licensee personnel were interviewed as well.

b. Observations and Findings

(1) Surveys

Daily, weekly, and other periodic contamination and radiation surveys were completed by Nuclear Reactor Laboratory (NRL) staff and by Health Physics staff members from the Radiation Safety Division of the Ohio State University (OSU) Office of Environmental Health and Safety (EH&S) as required by TS. Results were evaluated to ensure that the survey results did not exceed set action levels. When surveys did indicate that there was a problem with contamination, actions were taken to decontaminate the area affected.

(2) Postings and Notices

Postings at the entrances to the controlled areas were acceptable for the hazards present. The facility's radioactive material storage areas were properly posted. No unmarked radioactive material was noted.

Copies of current notices to workers required by 10 CFR Part 19, including copies of NRC Form-3, were posted in appropriate areas in the facility.

(3) Dosimetry

The licensee used a National Voluntary Laboratory Accreditation Program (NVLAP) accredited vendor to process personnel dosimetry. Examination of the records for the past two years through the date of the inspection showed that all exposures were well within NRC limits and the licensee action levels. Dosimetry was acceptably used by facility personnel.

(4) Radiation Monitoring Equipment

The calibration of portable survey meters was typically completed by EH&S Radiation Safety Division personnel. Calibration frequency met TS requirements and records were maintained as required.

(5) Radiation Protection Program

The licensee's Radiation Protection Program was established in the OSU Radiation Safety Guidebook and Records manual, dated September 15, 1995, and in the Radiation Safety Standards for the Ohio State University. The program included requirements that all personnel who had unescorted access to the facility receive training in radiation protection, policies, procedures, requirements, and facilities. Completion of this training was verified by the person's supervisor or by the person in charge of the laboratory using radioactive materials. The program appeared to be acceptable.

(6) ALARA Program

The ALARA Program was also outlined and established in the OSU Radiation Safety Guidebook and Records manual. The ALARA program provided guidance for keeping doses as low as reasonably achievable and was consistent with the guidance in 10 CFR 20.

(7) Facility Tours

The inspector toured the NRL and selected support laboratories and areas. Control of radioactive material and control of access to radiation areas were acceptable. The inspector also determined that the program for the monitoring of radioactive gases was consistent with applicable regulatory requirements. The principles of As Low As Reasonably Achievable (ALARA) were acceptably implemented to minimize radioactive releases. Monitoring equipment was acceptably maintained and calibrated. Records were current and acceptably maintained.

c. Conclusions

Surveys were being completed and documented acceptably to permit evaluation of the radiation hazards that might exist. Postings and notices met regulatory requirements.

Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and the NRC's regulatory limits. Radiation monitoring equipment was being maintained and calibrated as required. The Radiation Protection Program and the ALARA Program satisfied regulatory requirements. Radioactive effluents were monitored as required.

4. Transportation (86740)

a. Inspection Scope

The inspector interviewed licensee personnel and reviewed various records to verify compliance with regulatory requirements and procedural directions for transferring and/or shipping licensed radioactive material.

b. Observations and Findings

10 CFR 71.5(a) requires that a licensee who delivers licensed material to a carrier for transport comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Parts 170-189.

49 CFR 171.2(a) prohibits any person from offering hazardous material for transportation unless, among other requirements, the hazardous material is properly classified, described, packaged, marked, labeled, and in condition for shipment required or authorized under the Hazardous Material Regulations (49 CFR 171-177).

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49 CFR 172.203(d)(4) requires that the activity contained in each package of the shipment be listed on the shipping papers in terms of the appropriate SI units (e.g., Becquerel, Terabecquerel, etc.) or in terms of the appropriate SI units followed by the customary units (e.g., Curies, millicuries, etc.).

49 CFR 172.403(c) requires that the category of label applied to a package in the shipment with a Transport Index of greater than 1 but less than 10 be a Yellow III label.

49 CFR 172.504(a) requires that a transport vehicle containing any quantity of hazardous material bearing a Yellow III label be placarded with a RADIOACTIVE placard on each side and end of the vehicle.

Through records reviews and discussions with licensee personnel, the inspector determined that various shipments of licensed material had been made since the last inspection. Shipment records had been completed and were being maintained as required. The records showed that, in general, the material had been properly described and classified, that the correct labeling had been provided, and that the

contamination and radiation levels of the packages shipped had been recorded acceptably. However, some discrepancies were noted with the shipping papers as follows:

- (1) Of the shipping papers filled out by the licensee for four shipments made to the Cleveland Clinic during January and February of 1999, at least one set or more did not list the following required information: a) the total quantity of material being shipped, b) the chemical and physical form of the material being shipped, and c) the activity in SI units, such as becquerels, Terabecquerels, etc, or in SI units followed by the customary units, such as millicuries, Curies, etc.
- (2) The shipping papers for one shipment to the Cleveland Clinic on February 2, 1999, indicated that the package was incorrectly labeled compared with the Transport Index (TI) listed. The papers indicated that the TI was 1.2 and that the package was labeled with a Yellow II label. With a TI of 1.2 the proper labeling for the package would have been a Yellow III label. Also, as a result of the improper labeling of the package, the transport vehicle was not properly placarded as required.

The licensee was informed that failure to fill out the shipping papers and label a package according to the regulations was an apparent violation of 10 CFR 71.5(a) (VIO 50-150/00-201-01).

c. Conclusions

One apparent violation was noted for failure to provide all the required information on shipping papers for various shipments of radioactive material and failure to properly label a package for shipment.

5. Physical Security (81401, 81402, 81431)

a. Inspection Scope

To verify compliance with the licensee's Physical Security Plan (PSP), the inspector reviewed:

- logs, records, and reports
- the supporting security organization
- access and key controls
- intruder detection and physical barriers

b. Observations and Findings

The inspector determined that the licensee's physical protection measures conformed to the licensee's PSP and implementing procedures.

c. Conclusion

The security program at the facility was acceptably carried out.

6. Material Control and Accounting (85102)

a. Inspection Scope

To verify compliance with 10 CFR 70, the inspector reviewed:

- control of storage areas
- annual inventory results of Special Nuclear Material (SNM)
- associated records and reports

b. Observations and Findings

Records showed that SNM was adequately controlled and that physical inventories were conducted at least annually as required by 10 CFR 70.51(d). Nuclear Material Transaction Reports (DOE/NRC Form 741) and Material Status Reports (DOE/NRC Form 742) were being submitted by the licensee as required by 10 CFR 74.13(1).

c. Conclusion

No deficiencies were identified in the licensee's Material Control and Accounting program.

7. Follow-Up On Previous Open Items (69001)

a. Inspection Scope

The inspector reviewed the actions taken by the licensee following identification of two Inspector Follow-up Items (IFIs) during a previous inspection.

b. Observations and Findings

- (1) IFI - 50-150/99-201-01 - Follow-up on the corrective actions concerning not addressing compliance with TS requirements during safety audits.

NRC Inspection Report No. 50-150/99-201, dated March 4, 1999, outlined the problem. During this inspection, the inspector reviewed the actions taken by the licensee to correct the problem concerning the failure of the licensee to perform an audit of compliance with the requirements of the Technical Specifications. The licensee had subsequently completed a TS compliance audit in December 1999. These corrective actions were determined to be adequate.

- (2) IFI - 50-150/99-201-02 - Follow-up on the completion of radioactive materials shipping training and documentation of shipper certification.

NRC Inspection Report No. 50-150/99-201, dated March 4, 1999, outlined the problem. During this inspection the inspector reviewed the actions taken by the licensee. The inspector noted that the staff member in question had completed the required training concerning shipment of radioactive material and was now qualified

to complete the shipping paperwork and sign as a certified shipper. The corrective actions were determined to be adequate.

c. Conclusions

Acceptable actions were taken by the licensee regarding the previously identified issues and they are considered closed.

8. Exit Interview

The inspection scope and results were summarized on March 23, 2000, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Kauffman, Reactor Operations Staff
R. Myser, Associate Director, Nuclear Reactor Laboratory
J. Talnagi, Senior Reactor Operator

Other Personnel

R. Anderson, Health Physicist, OSU Office of EH & S
J. Brown, Officer, OSU Security Center, OSU Police Department
R. Clum, Health Physicist, OSU Office of EH & S
C. Kuhn, Public Safety Dispatcher, OSU Police Department
R. Peterson, Director, Office of Radiation Safety, OSU Office of EH & S
R. Stephens, Officer, OSU Security Center, OSU Police Department

INSPECTION PROCEDURES USED

IP 69001: Class II Non-Power Reactors
IP 81401: Plans, Procedures, and Reviews
IP 81402: Reports of Safeguards Events
IP 81431: Fixed Site Physical Protection of Special Nuclear Material of Low Strategic Significance
IP 85102: Material Control and Accounting - Reactors
IP 86740: Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-150/00-201-01	VIO	Failure to provide all the required information on various shipping papers and failure to properly label a package for shipment.
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Closed

50-150/99-201-01	IFI	Follow-up on the corrective actions concerning failure to address compliance with TS requirements during safety audits.
50-150/99-201-01	IFI	Follow-up on the proper completion of radioactive materials shipping training and documentation.

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DOT	Department of Transportation
EH&S	Environmental Health and Safety
IFI	Inspector Follow-up Item
IP	Inspection Procedure
kW	Kilowatt
NPR	Non-Power Reactor
NRL	Nuclear Reactor Laboratory
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
PDR	Public Document Room
PSP	Physical Security Plan
ROC	Reactor Operations Committee
SNM	Special Nuclear Material
TS	Technical Specifications
TRTR	Test, Research, and Training Reactor
OSU	Ohio State University
OSURR	Ohio State University Research Reactor