December 5, 2013

Thomas E. Blue, Director
Nuclear Reactor Laboratory
Ohio State University
1298 Kinnear Road
Columbus, OH 43212

SUBJECT: THE OHIO STATE UNIVERSITY – NRC ROUTINE INSPECTION REPORT NO. 50-150/2013-201

Dear Mr. Thomas Blue:

On November 18-21, 2013, the U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at your Ohio State University Nuclear Reactor Laboratory facility (Inspection Report No. 50-150/2013-201). The enclosed report documents the inspection results, which were discussed on November 21, 2013, with various members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, and requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Ossy Font at 301-415-2490 or by electronic mail at Ossy.Font@nrc.gov.

Sincerely,

/RA P. Isaac Acting for/

Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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

Enclosure:
NRC Inspection Report No. 50-150/2013-201

cc: See next page

cc:

Chief
Bureau of Radiation Protection
Ohio Department of Health
246 North High Street
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Radiological Branch Chief
Ohio Emergency Management Agency
2855 West Dublin-Granville Road
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Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

Should you have any questions concerning this inspection, please contact Ossy Font at 301-415-2490 or by electronic mail at Ossy.Font@nrc.gov.

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DATE	12/4/2013	12/5/2013	12/5/2013

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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No.:	50-150
License No.:	R-75
Report No.:	50-150/2013-201
Licensee:	Ohio State University
Facility:	Nuclear Reactor Laboratory
Location:	Columbus, Ohio
Dates:	November 18-21, 2013
Inspector:	Osvaldo Font Patrick Isaac
Approved by:	Gregory T. Bowman, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

ENCLOSURE

EXECUTIVE SUMMARY

Ohio State University
Nuclear Reactor Laboratory
Report No: 50-150/2013-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the Ohio State University's (the licensee's) Class II research and test reactor safety program including: 1) organization and staffing, 2) operations logs and records, 3) operator requalification, 4) surveillance and limiting conditions for operations, 5) maintenance logs and records 6) fuel handling logs and records, and 7) emergency preparedness since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and in compliance with NRC requirements. No violations or deviations were identified.

Organization and Staffing

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

Operations Logs and Records

- Operational activities were consistent with applicable TS and procedural requirements.

Operator Requalification

- Operator requalification was being conducted and completed as required by the Operator Requalification Program.

Surveillance and Limiting Conditions for Operations

- The program for Surveillance and LCO confirmation was implemented in accordance with TS Sections 3.0 and 4.0 requirements.

Maintenance Logs and Records

- Maintenance logs, records, reviews, and performance satisfied TS and procedure requirements.

Fuel Handling Logs and Records

- Fuel movements and inspections were being completed and documented in accordance with the requirements specified in the TS and by procedure.

Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the Emergency Plan.

REPORT DETAILS

Summary of Plant Status

The Ohio State University's (OSU, the licensee's) five-hundred kilowatt (kW) open pool-type reactor continued to be operated in support of undergraduate instruction, laboratory experiments, reactor operator training, and various types of irradiation projects. During the inspection, the reactor was started up and operated, and shut down in accordance with applicable procedures to support these ongoing activities.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69001)

The inspectors reviewed the following regarding the Ohio State University Nuclear Reactor Laboratory (OSU-NRL) organization and staffing to ensure that the requirements of Technical Specifications (TS) Section 6.1, were being met:

- Organizational structure (TS Figure 6.1)
- Management responsibilities and authority
- Staffing requirements for safe operation of the research reactor facility (TS Section 6.1.3)
- Ohio State University Research Reactor (OSURR) Console Log Book entries from March 13, 2012 to present

b. Observations and Findings

The inspectors determined that the organizational structure at the OSU-NRL facility had not changed since the previous U.S. Nuclear Regulatory Commission (NRC) inspection. The Associate Director continued to be responsible for the day-to-day operation of the OSURR and ensured that operations were conducted in a safe manner.

The inspectors noted that there were four Senior Reactor Operators (SROs) working at the facility and no reactor operators and determined that the minimum shift staffing composition for operation, including on-call personnel, is consistent with the TS.

c. Conclusion

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

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS Section 6.3 and 6.7 and applicable procedure requirements for operation:

- OSURR Console Log Book entries from March 13, 2012 to present
- Request for Reactor Operations procedures and forms for 2012 – present

- Pre-Startup and Post-Shutdown procedures and forms for 2012 - present
- "Annual Report for The Ohio State University Research Reactor, License R-75, Docket 50-150," for Fiscal Years (FY) 2012 and 2013

b. Observations and Findings

The inspectors reviewed selected log book entries, request for operations, and pre-start and post-shutdown forms and determined that logs and records are maintained as required by the licensee's administrative procedures. Records also showed that operational conditions and parameters were consistent with the license and TS requirements. The inspectors also observed the reactor staff perform the required pre-start and post-shutdown checkout and a reactor startup and shutdown and the completion of the associated records and logs. The inspectors determined that reactor operations were carried out following written procedures as required by TS Section 6.3 and 6.7.

A total of seven scrams occurred during reactor operations from 2011 – present. They were recorded and resolved before reactor operations were resumed as authorized by the SRO on duty.

c. Conclusion

Operational activities were consistent with applicable TS and procedural requirements.

3. Operator Requalification

a. Inspection Scope (IP 69001)

To verify that the licensee was complying with the requirements of the operator requalification program, the inspectors reviewed selected aspects of:

- Operator physical examination records
- OSURR Console Operating Experience Records from October 2011 to present
- OSURR Operator Requalification Training Sessions for 2011 and 2012
- OSURR Operator Requalification Operational Examination Records for 2011 and 2012
- OSURR Operator Requalification Written Examination Records for 2011 and 2012
- Logs and records of reactivity manipulations and data for 2011 to the present
- OSURR Console Log Book entries from March 13, 2012 to July 22, 2013
- NRL Administrative Procedure AP-09, "RO/SRO Requalification," Rev. 7, approval dated September 25, 1996

b. Observations and Findings

As of the date of the inspection, all the operators' licenses were current. All operators were enrolled in the licensee's NRC-approved requalification and training program and had completed a minimum of four hours of shift functions per quarter. The inspectors

noted that operators were receiving the required biennial medical examinations.

A review of the logs and records showed that training was being conducted in accordance with the program. Requalification program data such as completion of written examinations and operation tests was documented as required. The inspectors noted that the last written examination was administered in December 2012. Records of reactivity manipulations, and other operations activities were being maintained.

c. Conclusion

Operator requalification was being conducted and completed as required by the Operator Requalification Program.

4. Surveillance and Limiting Conditions for Operations

a. Inspection Scope (IP 69001)

To determine that surveillances and Limiting Conditions for Operations (LCOs) verifications were being completed as required by TS Sections 3.0 and 4.0, the inspectors reviewed:

- Reactivity Data / Control Rod Calibration Data Logbook
- Surveillance tracking log sheets
- OSURR Console Log Book entries from March 13, 2012 to July 22, 2013
- "Annual Report for The Ohio State University Research Reactor, License R-75, Docket 50-150," for Fiscal Years (FY) 2012 and 2013
- Process System Checks Records from January 2013 to present
- Core Reactivity Data Calculations (Procedure IM-05) dated June 21, 2013

b. Observations and Findings

The inspectors performed a random sampling of the daily, weekly, monthly, quarterly, semi-annual, and other periodic checks, tests, and verifications for TS required LCOs and determined that they were completed in the specified time frame and in accordance with licensee procedures. The records and logs reviewed were complete and were being maintained as required. The inspectors noted that the licensee maintained an effective record keeping system that helped ensure that all required tests, LCO verifications, and calibrations were completed in a timely manner. All routine periodic surveillance items and tasks were listed on log sheets readily visible to all operators.

All the recorded results for the activities reviewed by the inspectors were within the TS required parameters.

c. Conclusion

The program for Surveillance and LCO confirmation was implemented in accordance

with TS Sections 3.0 and 4.0 requirements.

5. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To determine that maintenance activities were being completed as required by TS Sections 3.0, and 4.0, the inspectors reviewed:

- Maintenance Log-Book Volume III, pages 72-110
- OSURR Console Log Book entries from March 13, 2012 to July 22, 2013
- "Annual Report for The Ohio State University Research Reactor, License R-75, Docket 50-150," for FYs 2012 and 2013
- Reactor Operations Committee Meeting Minutes for December 7, 2011, and December 5, 2012
- NRL Operations and Maintenance Procedure OM-16, "Power Calibration," Rev. 2, approval dated November 4, 2002

b. Observations and Findings

The inspectors reviewed the records regarding scheduled and unscheduled preventive and corrective maintenance activities for 2012 through the present. This review indicated that all maintenance activities were controlled by, and documented in, the maintenance and/or operations log as required. After completion of maintenance activities, system operational checks were performed to ensure that the affected systems functioned properly before returning them to service.

c. Conclusion

Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

6. Fuel Handling

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Sections 4.1.2, 5.3, 5.4, and 5.5, the inspectors reviewed:

- OSURR Console Log Book entries from March 13, 2012 to July 22, 2013
- Fuel Element Inspection Records for 2011 and 2013
- Fuel Element Inspection Inventory dated March 21, 2012 through June 20, 2013
- NRL Administrative Procedure AP-13, "Personnel Required for Reactor Operations," dated March 21, 2008
- NRL Operations and Maintenance Procedure OM-07, "Fuel Element Inspections," Rev. 6, approval dated May 1, 2001

b. Observations and Findings

The licensee maintained a fuel element record of all their elements. The inspectors reviewed selected records for fuel movements conducted for the periodic surveillance measurements and inspection of the reactor fuel. The movements of elements and their position in the core were maintained and tracked. All fuel movements were noted in the appropriate OSURR Console Log Book.

c. Conclusion

Fuel movements and inspections were being completed and documented in accordance with the requirements specified in the TS and by procedure.

7. Emergency Preparedness

a. Inspection Scope (IP 69001)

The inspectors reviewed the implementation of selected portions of the emergency preparedness program including:

- E-Plan for the Ohio State University Nuclear Reactor Laboratory, dated September 2012
- Inventory of emergency supplies, dated September 2011, 2012, 2013
- Scenarios and critiques of emergency drills 2011 and 2012
- NRL Emergency Procedure EP-01, “Emergency Procedures,” Rev. 25 (8-21-2013)
- NRL EP-03, “Response to Scrams and Alarms,” Rev. 1 (9-12-2012)
- NRL EP-04, “Emergency Equipment Inventory,” Rev. 10 (10-24-2013)
- Emergency Response Plan for the OSU-NRL (10-24-2013)

b. Observations and Findings

The inspectors noted that the E-Plan was being audited and reviewed annually as required. Implementing procedures were reviewed biennially and revised as needed to effectively implement the E-Plan. Emergency facilities, instrumentation, and equipment were being maintained and controlled, and supplies were being inventoried annually as required in the E-Plan.

The inspectors also noted that response to facility emergencies would be provided by the university such as campus police and the University Hospital. Outside agencies such as the City of Columbus Fire Department also would respond to emergencies.

Emergency preparedness and response training for reactor staff was completed during operator requalification and documented in that program’s records. The licensee held tours for the Columbus Fire Department and OSU Police department in January/February 2012.

Emergency drills had been conducted annually as required by the E-Plan. The drill for 2011 was a contaminated staff member. The OSU Medical Center participated in the 2012 drill which involved a radiologically contaminated person. Critiques were written following the exercises to document the strengths and weaknesses identified during the exercises and to develop possible solutions to any problems noted. The critiques indicated that the E-Plan was being properly implemented and all recommendations made following the drills were subsequently addressed.

An emergency drill recommendation resulted in the creation of an Emergency Response Plan for the OSU-NRL to be kept at the OSU Police Department dispatch room. It provides information for use by the OSU Department of Public Safety and supporting responders in the event of a fire or other emergency at the reactor facility.

The inspectors and the NRL Associate Director visited the OSU Police Department and talked with the Deputy Chief of Police and the Captain along with the Director of the OSU Department of Public Safety and the Communications Supervisor to discuss their roles during an emergency. The alarm center and dispatch room were visted and the inspectors inquired about the recently created Emergency Response Plan for the OSU-NRL. Though specific training has not taken place for this new document, it is located in a place where the dispatcher has been trained to look for information.

c. Conclusion

The emergency preparedness program was conducted in accordance with the Emergency Plan.

8. Exit Interview

The inspection scope and results were summarized on November 21, 2013, with members of licensee management and staff. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

T. Blue	Director, Nuclear Reactor Laboratory
A. Kauffman	Associate Director, Nuclear Reactor Laboratory and SRO
K. Herminghuysen	Research Associate and SRO

Other Personnel

R. Mormon	Deputy Chief of Police, OSU Police Department
D. Rose	Captain, OSU Police Department
S. Persons	Director, OSU Department of Public Safety
T. Page	Communications Supervisor, OSU Department of Public Safety

INSPECTION PROCEDURES USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
ADAMS	Agencywide Documents Access and Management System
AP	Administrative Procedure
E-Plan	Emergency Plan
EP	Emergency Procedure
IM	Instrumentation Use and Maintenance
IP	Inspection Procedure
kW	Kilowatt
LCO	Limiting Conditions for Operation
No.	Number
NRC	U.S. Nuclear Regulatory Commission
NRL	Nuclear Reactor Laboratory
OM	Operations and Maintenance Procedure
OSU	The Ohio State University
OSURR	The Ohio State University Research Reactor
Rev.	Revision

ROC	Reactor Operations Committee
SRO	Senior Reactor Operator
TS	Technical Specifications