

March 29, 2017

Colonel L. Andrew Huff, Director
Armed Forces Radiobiology
Research Institute
National Naval Medical Center
8901 Wisconsin Avenue
Bethesda, MD 20889-5603

SUBJECT: ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE – NUCLEAR
REGULATORY COMMISSION ROUTINE INSPECTION REPORT
NO. 50-170/2017-201 AND NOTICE OF VIOLATION

Dear Colonel Huff:

From January 24-26, 2017, the U.S. Nuclear Regulatory Commission (NRC or the Commission) conducted an inspection at the Armed Forces Radiobiology Research Institute reactor facility. The inspection included a review of activities authorized for your facility. The enclosed report documents the inspection results, which were discussed on January 26, 2017, with you and members of your staff.

This inspection was an examination of 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. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

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 included on the NRC's Web site at www.nrc.gov; select **What We Do, Enforcement**, and then **Enforcement Policy**. 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 constitutes a failure to meet regulatory requirements that has more than minor safety significance and the licensee failed to identify the violation.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should 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 Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.390, "Public inspections, exemptions, request for withholding," a copy of this letter and its enclosure will be made 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 Johnny Eads at (301) 415-0136 or by electronic mail at Johnny.Eads@nrc.gov.

Sincerely,

/RA/

Anthony J. Mendiola, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-170
License No. R-84

Enclosures:
As stated

cc: w/enclosure: See next page

SUBJECT: ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE – NUCLEAR
 REGULATORY COMMISSION ROUTINE INSPECTION REPORT
 NO. 50-170/2017-201 AND NOTICE OF VIOLATION DATED: MARCH 29, 2017

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NRC-002

OFFICE	NRR/DPR/PROB*	NRR/DPR/PROB*	NRR/DPR/PROB
NAME	(OFont for) JEads	NParker	AMendiola
DATE	3/23/17	3/23/17	3/29/17

OFFICIAL RECORD COPY

Armed Forces Radiobiology Research Institute

Docket No. 50-170

cc:

Director, Maryland Office of Planning
301 West Preston Street
Baltimore, MD 21201

Montgomery County Executive
101 Monroe Street, 2nd Floor
Rockville, MD 20850

Environmental Program Manager III
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Maryland Dept of the Environment
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Baltimore, MD 21230-1724

Director
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Maryland Dept of the Environment
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Test, Research and Training
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Gainesville, FL 32611

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Nuclear Programs
Maryland Department of Natural Resources
Tawes B-3
Annapolis, MD 21401

Mr. Stephen I. Miller
Reactor Facility Director
Armed Forces Radiobiology
Research Institute
8901 Wisconsin Avenue
Bethesda, MD 20889-5603

NOTICE OF VIOLATION

Armed Forces Radiobiology
Research Institute

Docket No. 50-170
License No. R-84

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted January 24-26, 2017, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(q)(3) states, in part, "The licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains an analysis demonstrating that the changes do not reduce the effectiveness of the plan."

The Emergency Plan for the Armed Forces Radiobiology Research Institute (AFRRI), Section 1.3.1, states, in part, that the site boundary is bounded on the south by Palmer Road South, on the west and north by Stone Lake Road, and on the east by a circular arc extending from Stone Lake Road to the northernmost corner of the AFRRI "N" parking lot, clockwise to the intersection of Palmer Road South and Grier Road. It also states that, "Within this area, AFRRI has jurisdiction and control of activities."

Contrary to the requirements of 10 CFR 50.54(q)(3), on January 26, 2017, the NRC inspector found the licensee had previously implemented a change to eliminate AFRRI jurisdiction and control of the AFRRI "N" parking lot without prior NRC approval. The licensee failed to document that the change did not reduce the effectiveness of the plan nor seek NRC approval of the emergency plan change.

This has been determined to be a Severity Level IV violation (Section 6.6).

Pursuant to the provisions of 10 CFR 2.201, "Notice of violation," Armed Forces Radiobiology Research Institute 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, 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: (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.

Enclosure 1

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and Management System), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public 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 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, "Protection of Safeguards Information: Performance Requirements."

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

Dated this 29th day of March 2017

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

Docket No. 50-170

License No. R-84

Report No. 50-170/2017-201

Licensee: Armed Forces Radiobiology Research Institute

Facility: AFRRRI Reactor Facility

Location: Bethesda, MD

Dates: January 24-26, 2017

Inspector: Johnny Eads

Approved by: Anthony J. Mendiola, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Armed Forces Radiobiology Research Institute
Research Reactor Facility
NRC Inspection Report No. 50-170/2017-201

The primary focus of this routine, announced inspection included the onsite review of selected aspects of the Armed Forces Radiobiology Research Institute (AFRRI's or the licensee's) Class II research reactor facility safety programs, including: (1) organization and staffing, (2) operations logs and records, (3) requalification training, (4) surveillance and limiting conditions for operation, (5) emergency preparedness, (6) maintenance logs and records, and (7) fuel handling logs and records. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with U.S. Nuclear Regulatory Commission (NRC) requirements.

Organization and Staffing

- The licensee's organization and staffing were in compliance with the requirements specified in the technical specification (TS) 6.1.

Operations Logs and Records

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

Requalification Training

- Operator requalification was up-to-date and was being performed as required by AFRRI's reactor operator requalification program.

Surveillance and Limiting Conditions for Operation

- All surveillances were completed in accordance with TS 4.0 and the licensee was in compliance with limiting conditions for operation requirements in TS 3.0.

Emergency Planning

- The emergency preparedness program was generally conducted in accordance with the Emergency Plan. One Level IV violation was identified.

Maintenance Logs and Records

- Maintenance activities ensured that equipment remained consistent with the safety analysis report and TS requirements.

Fuel Handling Logs and Records

- Fuel handling and inspection activities were completed and documented as required by TS and facility procedures.

REPORT DETAILS

Summary of Facility Status

The Armed Forces Radiobiology Research Institute (AFRRI's or the licensee's) one megawatt training reactor and isotopes production, General Atomics (TRIGA) Mark II research reactor, located on the campus of the National Naval Medical Center, operated in support of the Institute's mission of research, experiments, education, reactor operator training and periodic equipment surveillance. During the inspection the reactor was maintained in a shutdown status for maintenance.

1. Organization and Staffing

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

To verify that the licensee's organization and staffing were in accordance with AFRRI technical specification (TS) 6.1, the inspector reviewed the following:

- Organizational structure
- Management responsibilities
- Staffing requirements for safe operation of the research reactor facility
- Reactor Logbook Number 138, August 6, 2015 to November 23, 2016
- Reactor Logbook Number 139, December 12, 2016 to present

b. Observations and Findings

The structure and functions of the licensee's organization at the AFRRI facility had not functionally changed since the last U.S. Nuclear Regulatory Commission (NRC) inspection. The licensee's current organizational structure and assignment responsibilities were consistent with those specified in the TS 6.1. There were no major changes in management since the last inspection. All positions reviewed were filled with qualified personnel. Review of records verified that management responsibilities were generally administered as required by TS 6.1.2 and applicable procedures. The inspector determined from the reactor console logbook that minimum staffing and on-call requirements were in compliance with TS 6.1.3.2.

c. Conclusion

The licensee's organization and staffing was in compliance with the requirements specified in the TS 6.1.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with TSs 2.0, 3.0, and 6.0 and applicable procedure requirements for operation:

- Reactor Logbook Number 138, August 6, 2015 to November 23, 2016
- Reactor Logbook Number 139, December 12, 2016 to present
- AFRRRI Operational Procedure 8, "Reactor Operations," dated May 1, 1998
- AFRRRI Operational Procedure 8, Tab B, "Daily Operational Startup Checklist," dated April 5, 2012
- AFRRRI Operational Procedure 8, Tab I, "Daily Operational Shutdown Checklist," dated March 21, 2012
- Daily Operational Startup and Shutdown Checklists, 2015 to present
- AFRRRI 2015 Annual Report

b. Observations and Findings

The operating logs and records were well maintained and provided a clear indication of operational activities, changes in reactivity, and maintenance actions or malfunctions that had occurred.

Logs and records also showed that operational conditions and parameters were consistent with license and TS requirements. Information on the operational status of the facility was recorded in logbooks and on checklists as required by procedure.

Operational problems and events noted in the logs were reported, reviewed, and resolved as required. Operations logs and records also documented that shift staffing met the minimum requirements.

c. Conclusion

Operational activities were consistent with applicable TS and procedural requirements.

3. Requalification Training

a. Inspection Scope (IP 69001)

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

- "Reactor Operator Requalification Program for the Armed Forces Radiobiology Research Institute TRIGA Reactor Facility," revised September 12, 2016
- Effective dates of current operator licenses

- Operator training records maintained on “Requalification Program Checklist,” forms in individual folders for each operator
- Medical examination records for the past 2 years
- Operator requalification training lectures for 2015–2016
- Facility written exam, administered in 2016

b. Observations and Findings

As of the date of the inspection, all the NRC-licensed senior reactor operators on staff maintained current licenses. All operators were enrolled in the licensee’s NRC-approved requalification and training program and had completed a minimum of 4 hours of shift functions per quarter. The inspector 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 attendance at training sessions and completion of written examinations and operation tests, was documented as required. The inspector noted that the required biennial written examination was administered in 2016 as required. Records of quarterly reactor operations, reactivity manipulations, and other operations activities were being maintained.

c. Conclusion

Operator requalification was up-to-date and was being performed as required by the AFRRRI reactor operator requalification program.

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

To determine that limiting conditions of operation (LCOs) were met and surveillances were completed as required by TSs 3.0 and 4.0, the inspector reviewed:

- TS for the AFRRRI reactor facility
- 2015 Annual Operating Report for the AFRRRI
- AFRRRI Malfunction Log from 2015 to present
- Reactor Logbook Number 138, August 6, 2015 to November 23, 2016
- Reactor Logbook Number 139, December 12, 2016 to present
- Daily Operational Startup/Shutdown Checklist, 2015 to present
- Calibration procedures for the AFRRRI reactor facility
- Maintenance procedures for the AFRRRI reactor facility
- TRIGA Tracker Report

b. Observations and Findings

Daily, weekly, monthly, quarterly, semi-annual, and other periodic checks, tests, and verifications for TS required LCOs were being completed as required. The inspectors performed a random sampling of the AFRRRI surveillance and verified that the reactor fuel elements inspection was performed in accordance with TS 4.6, that the ventilation system check was performed in accordance with TS 4.4, and the area radiation monitoring system check was performed in accordance with TS 4.5.

The inspector reviewed a random sampling of operational logs and records and determined that they met the required LCOs.

The AFRRRI uses a computer database, the TRIGA Tracker Report, to track completion of the various required surveillance and LCO verifications. The inspector performed a random sampling of the database to ensure that there were no overdue requirements and cross-referenced the applicable TS to ensure all required surveillances were accounted for in the TRIGA Tracker Report; there were no issues noted.

c. Conclusion

All surveillances were completed in accordance with TS 4.0 and the licensee was in compliance with LCO requirements in TS 3.0.

5. Emergency Preparedness

a. Inspection Scope (IP 69001)

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

- AFRRRI Emergency Plan, dated December 2003
- AFRRRI emergency drill conducted on December 17, 2015
- AFRRRI emergency drill conducted on December 22, 2016
- AFRRRI emergency supplies
- Security guard radiation safety procedures

b. Observations and Findings

The inspector reviewed the current emergency plan (EP). The inspector noted that the notification rosters in the control room and at the guard's desk were up to date and reviewed periodically in accordance with procedures. The inspector verified that the four emergency supply boxes were inventoried and their radiation monitoring devices were within their calibration period.

The inspector reviewed the 2015 and 2016 annual drills. The 2015 emergency drill was a large exercise with external participants, as required in the EP to be held biennially. The large exercise included participants from the Naval Support Activity Bethesda, police, and fire departments. The drill was successfully completed, followed by discussion and feedback. Action items were being tracked and closed out, as appropriate.

The inspector verified that key emergency response personnel and individuals authorized access (e.g., guards) completed initial and periodic retraining of the emergency preparedness program as required by the EP.

During the review of the AFRRI emergency plan, the inspector identified a violation of NRC requirements.

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(q)(3) states, in part, "The licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains analysis demonstrating that the changes do not reduce the effectiveness of the plan."

The EP for the AFRRI, Section 1.3.1, states, in part, that the site boundary is bounded on the south by Palmer Road South, on the west and north by Stone Lake Road, and on the east by a circular arc extending from Stone Lake Road to the northernmost corner of the AFRRI "N" parking lot, clockwise to the intersection of Palmer Road South and Grier Road. It also states that, "Within this area, AFRRI has jurisdiction and control of activities."

Contrary to the requirements of 10 CFR 50.54(q)(3), on January 26, 2017, the NRC inspector found the licensee had previously implemented a change to eliminate AFRRI jurisdiction and control of the AFRRI "N" parking lot without prior NRC approval. The licensee failed to document that the change did not reduce the effectiveness of the plan nor seek NRC approval of the emergency plan change.

This has been determined to be a Severity Level IV violation (Section 6.6) (Violation 50-170/2017-201-01).

c. Conclusion

The emergency preparedness program was generally conducted in accordance with the EP with the exception of the identified violation.

6. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To determine that maintenance was being completed as required by the TS and applicable procedures, the inspector reviewed:

- AFRRRI Malfunction Log from 2015 to present
- Reactor Logbook Number 138, August 6, 2015 to November 23, 2016
- Reactor Logbook Number 139, December 12, 2016 to present
- Daily Operational Startup Checklist, various
- Maintenance procedures for the AFRRRI reactor facility
- TRIGA Tracker Report
- Annual Maintenance Report for 2016, dated December 12, 2016
- Annual Shutdown Maintenance Checklist

b. Observations and Findings

The inspector verified through records that annual, semi-annual, quarterly, and monthly maintenance requirements were performed on their respective frequency. Routine and preventive maintenance were well controlled and documented in the TRIGA tracking system. Use of maintenance and malfunction logs satisfied procedural requirements.

c. Conclusion

Maintenance activities ensured that equipment remained consistent with the safety analysis report and TS requirements.

7. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with the procedural requirements in TS 6.3.e:

- AFRRRI current stainless steel clad fuel element records
- Control room reactor fuel inventory map
- Reactor Logbook Number 138, August 6, 2015 to November 23, 2016
- Reactor Logbook Number 139, December 12, 2016 to present

b. Observations and Findings

The AFRRRI maintains a fuel element record of all their elements. Information such as serial number, core position, and power history are maintained and tracked. The inspector reviewed selected records for fuel movements and inspection of the reactor fuel. The inspector verified that fuel moves and

measurements were accurately recorded in each of the various records. A written and properly approved procedure was used in the conduct of the fuel moves.

c. Conclusion

Fuel handling and inspection activities were completed and documented as required by TS and facility procedures.

8. Exit Interview

The inspector presented the inspection results to licensee management at the conclusion of the inspection on January 26, 2017. The inspector described the areas inspected and discussed in detail the inspection observations. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

L. Andrew Huff, Colonel	Director, AFRRRI
S. Miller	Reactor Facility Director

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors
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ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-170/2017-201-01	VIO	Jurisdiction and control of AFRRRI "N" parking lot
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Closed

None.

Discussed

None.

PARTIAL LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
AFRRRI	Armed Forces Radiobiology Research Institute
EP	Emergency Plan
IP	Inspection Procedure
LCO	Limiting Condition for Operation
NRC	U.S. Nuclear Regulatory Commission
TS	Technical Specifications
TRIGA	Training reactor and isotopes production, General Atomics