

February 11, 2016

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 ANNOUNCED INSPECTION REPORT  
NO. 50-170/2016-202

Dear Colonel Huff:

From January 12-14, 2016, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Armed Forces Radiobiology Research Institute. The inspection included a review of activities authorized for your facility. The enclosed report documents the inspection results, which were discussed on January 14, 2016, with you and 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 inspector reviewed selected procedures and records, observed various 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* 2.390, "Public inspections, exemptions, 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).

L. Huff

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If you have any questions concerning this inspection, please contact Johnny H. Eads at (301) 415-0136 or by electronic mail at [Johnny.Eads@nrc.gov](mailto: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

Enclosure:  
As stated

cc: w/enclosure: See next page

Armed Forces Radiobiology Research

Docket No. 50-170

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L. Huff

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**NRC-002**

<b>OFFICE</b>	NRR/DPR/PROB/RI*	NRR/DPR/PROB/LA*	NRR/DPR/PROB/BC
<b>NAME</b>	JEads	NParker	AMendiola
<b>DATE</b>	02/10/2016	02/11/2016	02/11/2016

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

Docket No: 50-170

License No: R-84

Report No: 50-170/2016-202

Licensee: Armed Forces Radiobiology Research Institute

Facility: AFRRRI Research Reactor Facility

Location: Bethesda, MD

Dates: January 12-14, 2016

Inspectors: Johnny Eads

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

Enclosure

## EXECUTIVE SUMMARY

Armed Forces Radiobiology Research Institute  
AFRRI Research Reactor Facility  
Inspection Report No. 50-170/2016-202

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the Armed Forces Radiobiology Research Institute (AFRRI or the licensee's) Class II research reactor facility safety programs including: (1) procedures; (2) experiments; (3) health physics; (4) design changes; (5) committees, audits and reviews; and (6) transportation. 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.

### Procedures

- The inspector found that appropriate procedures were in effect, being followed, and being updated as necessary.

### Experiments

- Conduct and control of experiments met the requirements of regulations, the AFRRI Technical Specifications (TS), and the applicable facility procedures.

### Health Physics

- The radiation protection program was effective in minimizing radiation doses to individuals. Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory limits.

### Design Changes

- The design change program was being implemented as required by the TS and facility procedures.

### Committees, Audits and Reviews

- The Reactor and Radiation Facilities Safety Subcommittee provided the oversight required by the TS.

### Transportation

- The program for transportation of radioactive materials satisfied NRC requirements.

## REPORT DETAILS

### Summary of Facility Status

The Armed Forces Radiobiology Research Institute's (AFRRI's or the licensee's) one megawatt Training Research Isotope Production General Atomics Mark II research reactor, located on the campus of the Walter Reed National Military Medical Center, is operated in support of the Institute's mission of research, experiments, education, reactor operator training, and periodic equipment surveillance testing. During the inspection, the reactor was shut down and secured for maintenance and testing.

#### 1. Procedures

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

The inspector reviewed the following to ensure that the requirements of Technical Specifications (TS) Section 6.3, "Procedures," were being met concerning written procedures:

- AFRRI Operational Procedure 0, "Writing and Modifying Procedures," revised February 11, 1999
- AFRRI Operational Procedure 8, "Reactor Operations," Tab B, "Daily Operational Startup Checklist," revised April 10, 2012

##### b. Observations and Findings

The inspector reviewed the licensee's written procedures and revisions to procedures. The Procedures Manual was organized to address the specific categories of procedures identified in TS Section 6.3, "Procedures."

The inspector determined that written procedures were available for the activities delineated in TS Section 6.3, and were approved by the Reactor and Radiation Facility Safety Subcommittee (RRFSS) before they were implemented. A cover sheet on each procedure documented review by the Reactor Facility Director, the Reactor and Radiation Facility Safety Committee (RRFSC) or RRFSS, and each licensed reactor operator on the staff at the time the procedure modification was implemented.

Through observation of various activities at the facility, including reactor operation, the inspector determined that licensee personnel conducted activities in accordance with applicable procedures.

##### c. Conclusion

The inspector found that appropriate procedures were in effect, being followed, and being updated as necessary.

## 2. Experiments

### a. Inspection Scope (IP 69001)

To verify compliance with the licensee's procedures; TS Sections 3.6, "Limitations on Experiments;" TS Section 6.4, "Review and Approval of Experiments;" and Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, "Changes, test and experiments," the inspector reviewed selected aspects of:

- Reactor Logbook from January 2014, to present
- Reactor Utilization Requests, various 2014
- Operational Procedure 8, Tab A, "Logbook Entry Checklist," dated February 26, 2001

### b. Observations and Findings

The reactor utilization requests reviewed had been completed and contained the appropriate information, hazards analyses as applicable, and had been reviewed and approved as required by TS and procedure.

Through review of the experiment procedure and the reactor logbook, the inspector verified that the experiments were conducted as outlined in the experiment authorizations and as required by the TS.

### c. Conclusion

Conduct and control of experiments met the requirements of regulations, the AFRRRI TS, and the applicable facility procedures.

## 3. Health Physics

### a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Part 20, "Standards for Protection against Radiation," requirements:

- AFRRRI Facility and Environmental Thermoluminescent Dosimeter Report for the third quarter 2015
- Liquid Effluent Release Reports for 2015
- Gaseous Radioeffluents Reports for 2015
- Radiation Exposure Report (Extremity), various for 2015
- Radiation Exposure Report (Whole Body), various for 2015
- Reactor Controlled Area Radiation Level/Contamination Survey, various for 2015



b. Observations and Findings

The inspector reviewed the facility and environmental dosimetry program and determined that radiation doses were being monitored and reviewed as appropriate to evaluate the impact to the public.

Dosimetry results were reviewed by the inspector; AFRRI's associated occupational radiation exposures were in conformance with 10 CFR Part 20 and administrative limits. During the review of the records for 2015, the inspector identified that doses were low (in most cases zero) due, in part, to the limited time the reactor was operated.

The inspector reviewed radiation and contamination surveys for the reactor. All surveys reviewed indicated that radiation levels and contamination swipe results were less than the threshold action levels at the facility.

The calibration records of selected devices were reviewed. Calibration tags on devices found throughout the facility were verified to be current and in accordance with the calibration records that were reviewed.

No unmarked radioactive material was found in the facility. A copy of the current NRC Form 3 notice to radiation workers required by 10 CFR Part 19 was posted at the entrance to the control room and reactor bay and other conspicuously placed areas near laboratory work stations.

c. Conclusion

The radiation protection program was effective in minimizing radiation doses to individuals. Effluent monitoring satisfied licensee and regulatory requirements and releases were within the specified regulatory limits.

**4. Design Changes**

a. Inspection Scope (IP 69001)

To verify compliance with the licensee's procedures, TS Section 6.2.4, "Review Function," and 10 CFR 50.59, the inspector reviewed selected aspects of:

- Annual Report for AFRRI, covering the period January 1, 2014, through December 31, 2014
- Selected 10 CFR 50.59 analysis completed in 2015
- Reactor Logbook from January 2014, to present

b. Observations and Findings

Through review of applicable records and interviews with licensee personnel, the inspector determined that no changes requiring prior NRC approval had been initiated and/or completed at the facility since the last NRC operations inspection.

The licensee completed the 10 CFR 50.59 screenings and evaluation as required.

c. Conclusion

The design change program was being implemented as required per the TS and facility procedures.

**5. Committees, Audits, and Reviews**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with the requirements of TS Section 6.2, "Review and Audit":

- Minutes of the RRFSC meeting dated June 11, 2015, for the meeting held on January 15, 2015
- Minutes of the RRFSC meeting dated January 4, 2016, for the meeting held on December 22, 2015

b. Observations and Findings

The inspector verified that the RRFSC composition, meeting quorums, and meeting frequency were all in accordance with TS Section 6.2. Records of meeting proceedings were well organized and included complete sets of materials distributed at meetings. The inspector verified that review functions prescribed in TS Section 6.2.4, "Review Function," were all reviewed by the committee. The inspector also verified that the audit function required by TS Section 6.2.5, "Audit Function," was conducted and that the audit reports were reviewed by the RRFSC.

c. Conclusion

The RRFSC provided the oversight required by the TS.

## 6. **Transportation**

### a. Inspection Scope (IP 86740)

The inspector interviewed licensee personnel and reviewed the following records to verify whether the licensee has established and is maintaining an effective management-controlled program, to ensure radiological and nuclear safety for shipping of licensed radioactive material:

- Annual Report for AFRRI, covering the period January 1, 2014, through December 31, 2014
- Reactor Logbook from January 2014, to present

### b. Observations and Find

Through review of applicable records and interviews with licensee personnel, the inspector determined that the licensee had not completed any radioactive material shipments since the last inspection.

### c. Conclusion

The program for transportation of radioactive materials satisfied NRC requirements.

## 7. **Exit Interview**

The inspection scope and results were summarized during an exit meeting on January 14, 2016, with members of licensee management. The inspector described the areas inspected and discussed significant inspection observations. The licensee 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

CDR M. Perry	Radiation Protection Officer
SFC D. Planter	Security Operations Manager
S. Miller	Reactor Facility Director
H. Spence	Contractor

## **INSPECTION PROCEDURES USED**

IP 69001	Class II Research and Test Reactors
IP 86740	Transportation

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### Opened

None

### Closed

None

### Discussed

None

## **PARTIAL LIST OF ACRONYMS USED**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
AFRRI	Armed Forces Radiobiology Research Institute
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
RRFSC	Reactor and Radiation Facility Safety Committee
RRFSS	Reactor and Radiation Facility Safety Subcommittee
TS	Technical Specifications