September 26, 2013

Dr. Steven Reese, Director
Radiation Center and TRIGA Reactor
Oregon State University
Radiation Center, A100
Corvallis, OR 97331-5903

SUBJECT: OREGON STATE UNIVERSITY - NRC NON-ROUTINE INSPECTION REPORT NO. 50-243/2013-203

Dear Dr. Reese:

On August 12-15, 2013 and September 9-12, 2013, the U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted a non-routine, announced inspection at the Oregon State University Radiation Center TRIGA Mark-II Reactor facility (Inspection Report No. 50-243/2013-203). The enclosed report documents the inspection results which were discussed on September 11, 2013, with you, Mr. Todd Keller, Reactor Administrator, and Dr. Andrew Klein, Chair of the Reactor Operations Committee, and on September 12, 2013, with Mr. Scott Menn, Senior Health Physicist.

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. The inspectors reviewed selected procedures and representative records, interviewed personnel, and observed activities in progress. 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 Document Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) http://www.nrc.gov/reading-rm/adams.html.

Should you have any questions concerning this inspection, please contact Craig Bassett at (301) 466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/ Paulette Torres Acting for

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

Docket No.: 50-243
License No.: R-106

Enclosure:
NRC Inspection Report

cc:

Mayor of the City of Corvallis
Corvallis, OR 97331

David Stewart-Smith
Oregon Office of Energy
625 Marion Street, N.E.
Salem, OR 97310

Dr. Richard Spinrad,
Vice President for Research
Oregon State University
Administrative Services Bldg., Room A-312
100 Radiation Center
Corvallis, OR 97331-5904

Dr. Michael Hartman, Reactor
Administrator
Oregon State University
100 Radiation Center, A-100
Corvallis, OR 97331-5903

Dr. Andrew Klein, Chairman
Reactor Operations Committee
Oregon State University
100 Radiation Center, A-100
Corvallis, OR 97331-5904

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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ADAMS ACCESSION NO.:ML13267A032 ***via e-mail NRC-002**

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

Docket No:	50-243
License No:	R-106
Report No:	50-243/2013-203
Licensee:	Oregon State University
Facility:	TRIGA Mark-II Reactor Facility
Location:	Radiation Center Oregon State University Corvallis, Oregon
Dates:	August 12-15, 2013 and September 9-12, 2013
Inspectors:	Craig Bassett Taylor Lamb (August 12-14, 2013) Ossy Font (September 9-11, 2013)
Approved by:	Gregory T. Bowman, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Oregon State University
TRIGA Mark-II Reactor Facility
Report No: 50-243/2013-203

The primary focus of this non-routine, announced inspection was the onsite review of selected aspects of the Oregon State University (the licensee's) 1.1 Megawatt Class II research and test reactor safety program during an extended period of maintenance involving the removal of the reflector including: 1) organization and staffing, 2) review and audit and design change functions, 3) outage planning, 4) operator requalification, 5) procedures, 6) maintenance and surveillance, 7) fuel movement, 8) radiation protection, 9) general security, and 10) emergency preparedness since the last U. S. Nuclear Regulatory Commission (NRC) inspection of this project. The licensee's program was acceptably directed toward the protection of public health and safety and in compliance with NRC requirements.

Organization and Staffing

- The licensee's organization and staffing were in compliance with the requirements specified in Section 6 of the Technical Specifications.

- The support being provided by the contract personnel appeared to be adequate.

Review and Audit Functions and Design Change Control

- Review and oversight functions required by Technical Specification Section 6.2 were acceptably completed by the Reactor Operations Committee.

- Modifications or changes to the facility had undergone the required screenings and evaluations and had been reviewed and approved by the Reactor Operations Committee.

Outage Planning and Staff Communication Activities

- The outage was being conducted according to a specific schedule and outage work planning and coordination was appropriate.

- Staff and contractor personnel cognizance of facility conditions were acceptable and oversight functions were being acceptably completed.

Operator Licenses, Requalification, and Medical Activities

- Operator requalification was conducted as required and the program was up-to-date and being acceptably maintained in accordance with the Operator Requalification Program.

Procedures

- The facility procedure that had been developed for the reflector replacement project had been reviewed and approved by the Reactor Operations Committee as required.

- Procedural compliance was observed and found to be acceptable.

Maintenance and Surveillance

- Maintenance was being completed in accordance with Technical Specification and procedural requirements.

- The program for surveillance verifications and calibrations was being implemented in accordance with Technical Specification requirements.

Fuel Movement

- Fuel handling activities were conducted in accordance with facility procedures.

Radiation Protection

- Periodic and job specific surveys were completed and documented as required by procedure.

- An ALARA Plan had been developed for the reflector replacement project.

- Personnel dosimetry was being worn as required and recorded doses were within the NRC's regulatory limits.

- The radiation protection training program was acceptable and training was being completed as required.

General Facility Security

- Security facilities, equipment, procedures, and controls satisfied the physical security plan requirements and the reactor fuel was stored and secured properly.

REPORT DETAILS

Summary of Plant Status

The 1.1 megawatt TRIGA Mark-II research and test reactor at Oregon State University (the licensee) was shut down for an outage which involved extensive maintenance and upgrading including the replacement of the annular reflector.

1. Organizational Structure and Staffing

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

The inspectors reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Section 6 of the Technical Specifications (TS), revised through Amendment No. 22 of the facility operating license, dated September 30, 2008, were being met:

- Oregon State University (OSU) Radiation Center and TRIGA Reactor facility organizational structure and staffing
- Selected portions of the Reactor Console Logbook Number 160 for the past six months which indicated staffing levels
- Oregon State University TRIGA Reactor Operating Procedure (OSTROP) 6, "Administrative and Personnel Procedures," Revision (Rev.) LEU-2, reprinted August 2012, which outlined various administrative controls

b. Observations and Findings

The inspectors noted that the Director of the Radiation Center continued to report to the President of the University through the Vice President for Research. It was also noted that the Radiation Center organizational structure and the responsibilities of the reactor staff were as outlined in TS Section 6 and OSTROP 6 and had not changed since the last inspection.

Staffing levels remained consistent with those noted during the last inspection of this facility. The current reactor operations organization consisted of the Director of the Radiation Center, the Reactor Administrator, the Reactor Supervisor, and a Scientific Instrument Technician. It was noted that all these individuals were qualified Senior Reactor Operators (SROs). The staff also included another full-time SRO and a part-time Reactor Operator (RO) as well. This organization was as required and consistent with that specified in the TS.

During the current outage, the licensee's staff was augmented by personnel from General Atomics Electronics Systems (GA), the general contractor, and two subcontractors working for GA, Greenberry Industrial and Decisive Testing. Greenberry Industrial was responsible for lifting and moving various items of equipment from the reactor pool area and would perform tank repairs as needed. Decisive Testing was to conduct the ultrasonic/dye penetrant testing and visual inspection of the reactor tank once all items were removed and the water was drained. The support being provided by the contract personnel appeared to be adequate and was conducted in an efficient, professional, and safety conscious manner.

c. Conclusion

Organizational structure and staffing were in compliance with the requirements specified in TS Section 6. The support being provided by the contract personnel appeared to be adequate.

2. Review and Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

In order to verify that the licensee had established and conducted reviews and audits as required by TS Section 6.2 and to determine whether modifications to the facility had been reviewed in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, the inspectors reviewed:

- OSU 50.59 Screen Logbook
- OSU 50.59 Evaluation Logbook
- Reactor Operations Committee (ROC) meeting minutes for 2013
- Change screen reviews conducted under and documented in accordance with OSTROP 6, Figure 6.1 entitled, "Oregon State TRIGA Reactor (OSTR) 10 CFR 50.59 Screen Form," Numbers (Nos.) 13-01 through 13-04
- Change evaluations conducted under and documented in accordance with OSTROP 6, Figure 6.2 entitled, "OSU TRIGA Reactor (OSTR) 10 CFR 50.59 Evaluation Form," No. 13-01

b. Observations and Findings

(1) Review and Audit Functions

The inspectors reviewed the ROC meeting minutes for meetings held during 2013. These meeting minutes showed that the committee met quarterly and had considered the types of topics outlined by the TS Section 6.2. Review of the committee meeting minutes also indicated that the ROC provided appropriate guidance and direction for reactor operations, and ensured suitable use and oversight of the reactor. In addition, the inspectors attended an ROC meeting held on August 12, 2013. During that meeting the reflector replacement project was discussed and OSTROP 30, "Annular Reflector Replacement," was reviewed and approved.

(2) Design Control

The inspectors reviewed 10 CFR 50.59 screen and evaluation forms that had been completed for 2013, including Evaluation 13-01, "Evaluation for the Annular Reflector Replacement Project. Through the reviews and interviews with licensee personnel the inspectors determined that screenings and one evaluation had been conducted as required and in accordance with the requirements of OSTROP 6. The screenings and evaluations had been documented as required, had been reviewed and

approved by the ROC as needed, and had been signed off by the appropriate personnel.

c. Conclusion

Review and oversight functions required by TS Section 6.2 were acceptably completed by the ROC. Modifications or changes to the facility had undergone the required screenings and evaluations and had been reviewed and approved by the ROC.

3. Outage Planning and Staff Communication Activities

a. Inspection Scope (IP 69001)

To ensure that maintenance activities were being completed and to determine that surveillance activities and calibrations were being completed as required by TS Section 4, the inspectors reviewed selected aspects of:

- Gantt Chart developed for the Reflector Replacement Project
- Pre-Task Job Safety Analysis RADAR Card used by Greenberry Industrial personnel to detail what equipment was needed and what safety precautions were to be followed for the day
- OSTROP 30, "Annular Reflector Replacement," Rev. 0, ROC approval dated August 13, 2013
- General Atomics Electronics Systems (GA) Procedure, "OSU Removal and Installation Plan," release date August 30, 2013
- GA Procedure, "OSU Primary Tank Inspection Plan," release date August 30, 2013
- GA Procedure, "OSU Primary Tank Repair Plan," release date August 30, 2013
- GA Procedure, "OSU Tank Repair Inspection Plan," release date August 30, 2013

b. Observations and Findings

(1) Outage Planning

A review of the Gantt chart and various logbooks and specific instructions associated with the replacement project indicated that activities had been planned out, were generally on schedule, and were proceeding as planned. Outage and maintenance activities were being tracked and overseen by GA personnel assigned to cover the work, as well as by licensee personnel.

(2) Outage Oversight Activities

On Tuesday, Wednesday, and Thursday mornings, September 10, 11 and 12, the inspectors attended the morning outage meeting. The briefing included everyone involved in the outage activities including staff and contractor personnel as well as members of management. A detailed review of the day's activities was presented and the projected outcome was

outlined. Hazards and hold points were discussed so that everyone was aware of what to expect and what to do in case of a problem. Safety and good work practices were stressed. Greenberry Industrial personnel filled out a "Pre-Task Job Safety Analysis RADAR Card" prior to each day's work.

(3) Staff Communication

Observation of the work in progress indicated that communication was effective. Also, the Reactor Supervisor's Log and various records that were being maintained by the contractors were clear and provided an indication of ongoing activities. The records kept and the briefings that were given ensured that the operations staff and contractor personnel were aware of the conditions in the facility and the status of changes being made. As noted above, proper safety practices were stressed and there was an appropriate safety conscious work environment at the facility.

c. Conclusion

The outage was being conducted according to a specific schedule. Outage work planning and coordination was appropriate. Staff and contractor personnel cognizance of facility conditions were acceptable. Oversight functions were being acceptably completed.

4. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (IP 69001)

The inspectors reviewed the following in order to determine that operator training and requalification activities were conducted as required by the requalification program and that medical requirements were met:

- Reactor operations documented in Reactor Console Logbook, No. 160
- "Requalification Program for Licensed Operators of the Oregon State TRIGA Reactor," Rev. 1, reprinted September 30, 2004
- Logs and records of the number of hours spent operating the reactor maintained in the Operator Time Log and associated manual
- OSTROP 16, "Annual Surveillance and Maintenance Procedures," Rev. LEU-1, reprinted November 2008 and related log sheets

b. Observations and Findings

At the time of the inspection, there were five qualified SROs and one RO working at the facility. The inspectors verified that all the operators' licenses were current. It was noted that one operator's license had been due to expire in February 2012 but the licensee was aware of that and had prepared a license renewal application which was forwarded to the NRC in December 2011. As a result, the operator's license was renewed for another six years.

A review of the logs and records showed that training had been conducted in the areas stipulated in the licensee's requalification and training program such that all the material was covered within a two-year period. It was noted that lectures had been given as stipulated, training reviews had been documented, and written examinations had been completed. An annual operating test had been conducted for each operator by the Reactor Supervisor as required by the program as well. It was also verified that each operator had completed the required number of hours of reactor operations each calendar quarter as required. Records of these reactor manipulations, other operational activities, and/or Reactor Supervisor activities were being maintained, as were records of the Annual Operations Tests. The program was up-to-date and training was current.

In addition to the above, the inspectors verified that medical examinations were being completed biennially for each operator as required.

The inspectors asked the licensee how they were going to address the issue of ensuring that each operator met the quarterly operating requirement for the period while the reactor is shutdown due to the reflector replacement project. The licensee informed the inspectors that a plan was still being developed on how to get the operators recertified once the replacement work was completed and the reactor was ready for start-up. The licensee indicated that they will keep the NRC informed.

c. Conclusion

The requalification and training program was up-to-date and acceptably maintained.

5. Procedures

a. Inspection Scope (IP 69001)

To determine whether facility procedures were being audited annually and whether the procedures met the requirements outlined in TS Section 6.4, the inspectors reviewed:

- Procedural reviews and updates documented in ROC meeting minutes
- OSTROP 30, "Annular Reflector Replacement," Rev. 0, ROC approval dated August 13, 2013
- GA Procedure, "OSU Removal and Installation Plan," release date August 30, 2013
- GA Procedure, "OSU Primary Tank Inspection Plan," release date August 30, 2013
- GA Procedure, "OSU Primary Tank Repair Plan," release date August 30, 2013
- GA Procedure, "OSU Tank Repair Inspection Plan," release date August 30, 2013

b. Observations and Findings

The licensee had developed a specific procedure for the reflector replacement project. It dealt with the reflector replacement as well as start-up of the reactor following completion of the replacement work. As noted above, the inspectors attended the ROC meeting during which the new procedure was reviewed and approved by the ROC as required.

It was noted that the contract workers were following procedures developed and approved by the general contractor, General Atomics. The GA procedures were reviewed and concurred by all licensed operators, the Senior Health Physicist, the Reactor Supervisor, and the Reactor Administrator. A copy of these procedures was provided to the ROC but did not require their approval.

The inspectors observed various job evolutions during the inspection. These included removal of the Beam Port 4 collimator, removal of the annular reflector, removal of the reactor pedestal, removal of debris from the reactor tank floor, and dewatering of the reactor tank. The work observed by the inspectors during this inspection was completed in accordance with the applicable procedures.

c. Conclusion

The facility procedure that had been developed for the reflector replacement project had been reviewed and approved by the ROC as required. Procedural compliance was acceptable.

6. Maintenance and Surveillance

a. Inspection Scope (IP 69001)

To determine that surveillance requirements were being completed as required by TS Sections 3 and 4, and that maintenance activities were conducted when required, the inspectors reviewed:

- Reactor Console Logbook, Nos. 160
- Selected portions of the Reactor Supervisor's Log, Volume 15
- Selected surveillance and calibration test data sheets and records maintained in the Surveillance and Maintenance Records Notebook
- OSTROP 13, "Monthly Surveillance and Maintenance Procedures," Rev. LEU-1, reprinted November 2008 and related log sheets
- OSTROP 14, "Quarterly Surveillance and Maintenance Procedures," Rev. LEU-1, reprinted November 2008 and related log sheets

b. Observations and Findings

The inspectors noted that selected daily, monthly, quarterly, and semiannual checks, tests, and/or calibrations for TS-required surveillances were generally being completed as required. Some items had to be postponed due to the outage. These items were appropriately flagged and would be completed prior to restarting of the reactor.

All the surveillances reviewed that could be completed were completed on schedule and in accordance with licensee procedures. All the recorded results were within the TS and procedurally prescribed parameters. The records and logs reviewed were complete and being maintained as required.

The maintenance logs and records indicated that problems were addressed and preventive maintenance operations completed as required by procedure. Records showed that routine maintenance activities were conducted at the required frequencies and in accordance with the TS and/or the applicable procedure. As with various surveillance items, some maintenance activities had to be postponed due to the outage. Again, the licensee had noted these and was planning to complete these items prior to reactor restart.

c. Conclusion

The program for surveillance was being carried out in accordance with TS and procedural requirements. Maintenance was also being completed as required.

7. Fuel Movement

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify adherence to fuel handling and positioning requirements specified in TS Sections 4.1.e and 5.3:

- Reactor Console Logbook, No. 160
- Fuel handling equipment and instrumentation
- Selected portions of the Reactor Supervisor's Log, Volume 15
- Fuel handling records for moving fuel from the reactor to storage as documented on "Oregon State University TRIGA Mark II Research Reactor Fuel Element History File" cards maintained in the LEU Fuel Element History Logbook and on "Fuel Element Transfer Index Sheet" forms maintained in a separate notebook
- OSTROP 11, "Fuel Element Handling Procedures," Rev. LEU-1, reprinted November 2008

b. Observations and Findings

The inspectors determined that the licensee was maintaining the required records of the various fuel movements that were completed and verified that the movements were conducted in compliance with procedure. The procedures used for the movement of fuel from the reactor to a secure storage location were acceptable, as were the precautions that were required to be established during such evolutions. Fuel element locations were being tracked by annotations to the applicable fuel element forms in the log book and on a Fuel Status Board maintained in the Reactor Control Room.

c. Conclusion

Reactor fuel movements were made and documented in accordance with procedure.

8. Radiation Protection

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with 10 CFR Parts 19 and 20 and licensee administrative requirements:

- Training records for current contractor personnel
- Routine periodic surveys documented on various forms
- Radiological signs and postings in various areas of the facility
- Contractor Written Exams; taken and passed on Sept. 3, 2013
- Radiation/Radioactive Material User Orientation; Contract Section 2
- Dosimetry/exposure records for the current reflector replacement project
- Oregon State University TRIGA Reflector Replacement ALARA and Radiation Work Plan
- Various Health Physics (HP) notebooks entitled:
  - HP Notebook - Surveys, Volume I, "Daily/Weekly/ Monthly/Neutron Generator/and Semi-Annual Floor Surveys"
  - HP Notebook - Surveys, Volume II, "Special Surveys"
  - HP Notebook - Surveys, Volume IV, "Work Surveillance Reports"
- Radiation Center Health Physics Procedure (RCHPP) No. 1, "Guidelines for the Radiation Protection Program at the OSU Radiation Center," Rev. 9, dated November 2012
- RCHPP No. 20, "Radiation Survey Procedures for the Release of Items for Unrestricted Use," Rev. 3, dated July 2001
- RCHPP No. 24, "Procedures for Performing Routine (Daily, Weekly, Monthly, and Annual) Radiation Surveys and Non-Routine (Special) Radiation Surveys," Rev. 10, dated October 2004
- RCHPP No. 34, "Orientation and Training Program for the OSU Radiation Center," Rev. 19, dated October 2010
- RCHPP No. 37, "Dosimetry," Rev. 3, dated December 2006

b. Observations and Findings

(1) Surveys

Selected daily, weekly, and monthly radiation and/or contamination surveys were reviewed by the inspectors. The surveys had been completed by HP staff members or students who had received the appropriate training to conduct surveys. Any contamination detected in concentrations above established action levels was noted and the area was decontaminated. Results of the surveys were acceptably documented.

The inspectors observed as various items were removed from the reactor tank and placed into the Bulk Shield Tank (BST). The inspectors also observed as a survey was conducted in the drained reactor tank. Proper precautions and techniques were used during these evolutions.

The inspectors also noted that appropriate exit surveys were being conducted as required. Surveys of tools and equipment used by the contractor personnel were conducted appropriately following completion of the job. If items had inaccessible surfaces or areas, the licensee required that they be left at the facility and not were released to the contractor.

(2) Reflector Replacement ALARA and Radiation Work Plan

The inspectors reviewed the ALARA and Radiation Work Plan that the licensee had developed for the reflector replacement project. It contained a description of the work involved, the expected radiological conditions that would be encountered, shielding, and requirements for personnel involved including training, dosimetry, contamination control, and protective clothing. It also explained the ALARA goals for the project and the dose goal of 2 person-rem deep dose equivalent (DDE) or whole body dose. Also included was a requirement that an evaluation be made if doses in excess of 0.5 rem DDE or 3 rem to the extremities might be encountered.

The inspectors noted that the first portion of the project, the removal of items from the reactor tank, had proceeded routinely and little personal dose was expended (a total of less than 100 millirem cumulative for everyone involved). However, following a survey of the drained reactor tank, which included the equipment protruding from into the tank (i.e., the thermal column, the thermalizing column, and the ends of Beam Ports 1, 2, and 3), it was determined that the remaining work would be the most dose intensive. Following completion of the tank survey, the licensee was evaluating the project and trying to devise ways to effectively shield these various structures so that the tank inspection and repair, and the ultimate installation of the new reflector and remaining reactor structure, could be completed within the dose goal. The licensee indicated that they would keep the NRC informed of their progress and their plans.

(3) Dosimetry

The inspectors determined that the licensee used pocket ion chambers (PIC) and thermoluminescent dosimeters (TLD) for whole body monitoring of beta and gamma radiation exposure, as well as track-etch/albedo neutron dosimeters to measure neutron radiation. The licensee also used TLD finger rings for extremity monitoring. The dosimetry was supplied and processed by a National Voluntary Laboratory Accreditation Program accredited vendor, Mirion Technologies. Contractor personnel were issued TLDs, finger rings, and electronic dosimeters to be worn for each portion of the reflector replacement project.

An examination of the available PIC and TLD dosimetry results indicating radiological exposures at the facility for the project showed that the highest occupational doses were well within 10 CFR Part 20 limitations. As noted above, the total cumulative dose for the job to date was less than 100 millirem.

Through direct observation the inspectors determined that dosimetry was acceptably used by facility and contractor personnel and exit frisking practices were in accordance with facility radiation protection requirements.

(4) Radiation Protection Training

The inspectors reviewed the radiation worker training given to the contractor personnel working on the reflector project. The training program was outlined in Radiation Center Health Physics Procedure (RCHPP) No. 34. It included initial radiation worker training for those new to the facility and refresher training for faculty and staff. The training was required to be completed before a person was allowed access to various restricted areas of the Radiation Center. The inspectors verified that the appropriate training had been given to, and had been completed by, the contractors. A written exam was taken and passed by the contractors and test results indicated that they generally understood the material. Additionally, incorrect questions were discussed with the contractors for clarification and understanding.

(5) Facility Tours

The inspectors toured the reactor bay and the reactor top extensively during the reflector replacement project on various occasions. The inspectors noted that facility radioactive material storage areas were properly posted. No unmarked radioactive material was noted. Radiation areas and radioactive material storage areas were posted as required.

c. Conclusion

The inspectors determined that the radiation protection and ALARA programs, as implemented by the licensee, satisfied regulatory requirements because: (1) periodic and job specific surveys were completed and documented acceptably to permit evaluation of the radiation hazards present, (2) an ALARA Plan had been developed and was being followed, (3) personnel dosimetry was being worn as required and recorded doses were within the NRC's regulatory limits, (4) the radiation protection training program was being implemented as stipulated in procedure.

9. General Facility Security

a. Inspection Scope (Inspection Procedures (IPs) 81401, 81402, 81431, and 81810)

To verify compliance with the licensee's NRC-approved physical security plan (PSP) and to assure that changes, if any, to the plan had not reduced its overall effectiveness, the inspectors reviewed:

- Security maintenance logs and records
- Security alarm, systems, and equipment checks
- Selected records of personnel granted access to the Radiation Center complex by management, as documented on Authorization List A and on Entry List B
- Oregon State University TRIGA Reactor (OSTR) Physical Security Plan, Rev. 20, dated August 2010
- OSTROP 14, "Quarterly Surveillance and Maintenance Procedures," Rev. LEU-1, dated November 2008
- OSTROP 24, "Physical Security System Functional Checks and Control Room Exit Procedures," Rev. 3, dated May 12, 2009

b. Observations and Findings

The PSP in use at the facility was the same as the latest revision submitted to the NRC. Various licensee procedures (OSTROPs) were consistent with, and adequately implemented, the PSP. Access control was being implemented as stipulated in the PSP.

Physical protection systems (barriers, alarms, and equipment) were reviewed and observed by the inspectors and were determined to be in accordance with the PSP. Periodic alarm checks were completed and documented as required. The inspectors also verified that the fuel was being maintained and stored in a secure location in accordance with the PSP and licensee procedures.

c. Conclusion

Security was being maintained in accordance with PSP requirements.

10. Exit Interview

The inspection scope and results were summarized on September 11 and 12, 2013, with licensee representatives. The inspectors discussed the findings for each area reviewed. The licensee acknowledged the findings and did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection of these program areas.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

T. Keller	Reactor Administrator
S. Menn	Senior Health Physicist
S. Reese	Director, OSU Radiation Center
R. Schickler	Senior Reactor Operator
S. Smith	Scientific Instrument Technician

Other Personnel

J. Gormley	TRIGA Program Manager, General Atomics Electronics Systems
S. Howard	Welder, Greenberry Industrial
T. Johnson	Welder, Greenberry Industrial
T. Price	Rigger, Greenberry Industrial
M. Shoemaker	Boilermaker and Job Foreman, Greenberry Industrial
A. Klein	Chairman, Reactor Operations Committee

INSPECTION PROCEDURE 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 81810:	Protection of Safeguards Information

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
GA	General Atomics Electronics Systems
E-Plan	Emergency Plan
ERIP	Emergency Response Implementing Procedure
HP	Health Physics
IP	Inspection Procedure
No.	Number
NRC	Nuclear Regulatory Commission
OSU	Oregon State University

OSTR	Oregon State University TRIGA Reactor
OSTROP	Oregon State University TRIGA Reactor Operating Procedure
PIC	Pocket Ion Chamber
PSP	Physical Security Plan
RCHPP	Radiation Center Health Physics Procedure
Rev.	Revision
RO	Reactor Operator
ROC	Reactor Operations Committee
SRO	Senior Reactor Operator
TLD	Thermoluminescent dosimeter
TS	Technical Specifications