July 10, 2017

Ms. Sandra Warren, General Manager
Aerotest Operations, Inc.
3455 Fostoria Way
San Ramon, CA 94583

SUBJECT: AEROTEST OPERATIONS, INC. – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 50-228/2017-201

Dear Ms. Warren:

From June 19-21, 2017, the U.S. Nuclear Regulatory Commission (NRC or the Commission) conducted an inspection at your Aerotest Radiography and Research Reactor facility. The enclosed report documents the inspection results which were discussed on June 21, 2017, 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,* Section 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).

Should you have any questions concerning this inspection, please contact Mr. Craig Bassett at (240) 535-1842 or by electronic mail at Craig.Bassett@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. 50-228
License No. R-98

Enclosure:
As stated

cc: w/enclosure: See next page

cc w/enclosure:

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SUBJECT: AEROTEST OPERATIONS, INC. – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 50-228/2017-201, DATED: JULY 10, 2017

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DATE	7/7/17	7/6/17	7/10/17

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

Docket No.	50-228
License No.	R-98
Report No.	50-228/2017-201
Licensee:	Aerotest Operations, Inc.
Facility:	Aerotest Radiography and Research Reactor
Location:	San Ramon, CA 94583
Dates:	June 19-21, 2017
Inspector:	Craig Bassett
Approved by:	Anthony J. Mendiola, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Aerotest Operations, Inc.
Aerotest Radiography and Research Reactor
Report No. 50-228/2017-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the Aerotest Operations, Inc. (the licensee's) Class II research and test reactor safety program including: (1) organization and staffing, (2) review and audit and design change functions, (3) procedures, (4) operator requalification, (5) maintenance and surveillance, (6) emergency preparedness, (7) radiation protection, (8) environmental monitoring, and (9) transportation 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.

Organization and Staffing

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

Review and Audit and Design Change Functions

- Review and oversight functions required by TS Section 12.1.3 were acceptably completed by the Reactor Safeguards Committee.

- No changes had been made at the facility since the last NRC inspection.

Procedures

- Facility procedures were being reviewed by the licensee and reviewed and approved by the Reactor Safeguards Committee as required by TS and administrative procedures.

Operator Requalification

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

- Medical examinations were being completed biennially as required.

Maintenance and Surveillance

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

- The program for completing surveillance checks, tests, verifications, and calibrations was being implemented in accordance with TS and procedural requirements.

Emergency Preparedness

- The current facility Emergency Plan was being reviewed biennially as required and updated as needed.
- Emergency response equipment was being maintained and alarms were being tested monthly as required.
- The Letter of Agreement with the local hospital had been signed and was being verified annually as required.
- Evacuation drills were being conducted twice each year as required by the Emergency Plan.
- Emergency preparedness training for staff personnel was being completed as required.

Radiation Protection

- Surveys and associated checks were completed and documented acceptably to permit evaluation of the radiological conditions present in the facility.
- Notices and postings at the facility met the regulatory requirements.
- Personnel dosimetry was being worn and doses were within the regulatory limits.
- Radiation monitoring equipment was maintained and calibrated as required.
- Training was provided as required covering the topics outlined in Title 10 of the *Code of Federal Regulations* 19.12.
- The Radiation Protection and As Low As Reasonably Achievable Programs satisfied regulatory requirements.

Environmental Monitoring

- Effluent monitoring satisfied license and regulatory requirements, and releases were within the specified regulatory and TS limits.

Transportation

- The program for transportation of radioactive materials satisfied NRC requirements.
- The shipment of radioactive waste from the facility was completed according to the applicable regulations.

REPORT DETAILS

Summary of Plant Status

Aerotest Operations, Inc. (Aerotest, the licensee) 250 kilowatt TRIGA conversion research reactor, known as the Aerotest Radiography and Research Reactor (ARRR), had been operated in the past in support of neutron radiography of various items of equipment and reactor operator training. However, the licensee had voluntarily ceased to operate the research reactor on October 15, 2010, because of foreign ownership issues. During this inspection, the reactor remained shut down.

1. Organization and Staffing

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

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of technical specification (TS) Sections 10.1 and 12.1 were being met:

- Current staffing of the ARRR
- Management responsibilities and organizational structure indicated in Section 12.0 of the TSs, as implemented through the latest revision to the Facility Operating License Number (No.) 98, Amendment No. 4, dated January 28, 1981
- Section II of the ARRR Procedures Manual entitled, “Operating Procedures,” Procedure Change Notice (PCN) No. 2, Reactor Safeguards Committee (RSC) approval dated June 28, 1990
- Annual Summary of Changes, Tests, and Experiments at ARRR for the period from July 1, 2014, to June 30, 2015, issued July 27, 2015, and for the period from July 1, 2015, to June 30, 2016, issued July 19, 2016 (the facility annual reports)

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities at the facility had not changed since the previous routine NRC inspection conducted in August 2015 (NRC Inspection Report No. 50-228/2015-201). The inspector noted that the General Manager was the local official in charge of day-to-day activities at the facility. The Reactor Supervisor (who was also assigned the duties of the Reactor Operations Manager) retained direct control over, and overall responsibility for, management of the reactor as specified in the TSs. The General Manager and the Reactor Supervisor reported to the President, Aerotest Operations, Inc.

It was noted that the facility license was being transferred to a new company called Nuclear Labyrinth, LLC. When that transfer is complete, ownership of the company will also be transferred to Nuclear Labyrinth LLC. It was also noted that

the license is again considered in timely renewal and all the documents associated with the renewal will need to be revised and submitted for NRC review and approval, including the TSs.

Through review of records and discussions with licensee personnel, the inspector noted that the current staffing at the ARRR included of the General Manager, the Reactor Supervisor, a Nuclear Engineer, the Manager of Neutron Radiography, and the Manager of Quality Assurance. The employees were monitoring the facility and completing maintenance and surveillance duties as required by the TSs.

c. Conclusion

The licensee's organization and staffing were in compliance with the TSs requirements.

2. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69001)

In order to ensure that the audits and reviews were being completed as required by TS Section 12.1.3 and to verify that any modifications to the facility were consistent with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, the inspector reviewed the following:

- Completed audits for 2015 and 2016
- Changes made under the licensee's 10 CFR 50.59 change process
- RSC meeting minutes for 2015 and 2016
- Duties of the RSC detailed in TSs Section 12.0
- Charter of the RSC outlined in Section I of the ARRR Procedures Manual entitled, "Administrative Procedures," PCN No. 2, RSC approval dated June 28, 1990
- The last two ARRR annual reports

b. Observations and Findings

(1) Review and Audits Functions

The RSC met at least once per year in accordance with TS requirements with the last two meetings held on November 18, 2015, and on December 1, 2016. The inspector reviewed the RSC's meeting minutes for these meetings. The meeting minutes showed that the RSC had considered the types of topics stipulated by the TSs. It was noted that the meetings were attended by all members of the committee. Review of the minutes also indicated that the committee provided guidance and direction for reactor operations.

The inspector verified that the periodic audits specified by TS Section 12.1.3 were being completed as required. The RSC minutes and audit records indicated that either the Chair of the RSC and another RSC member or just the RSC Chair conducted unannounced audits of facility operations annually and submitted the results to the President, Aerotest Operations, Inc. The inspector noted that there were no significant issues discovered and that the licensee took appropriate corrective actions in response to those audit findings or recommendations that were noted.

(2) Design Change Functions

Through review of applicable records and interviews with licensee personnel, the inspector determined that no changes had been initiated since the last NRC inspection. The most recent change had been one involving the replacement of two waste Hold-up Tanks at the facility. It was noted that that change had been reviewed and approved by the RSC as required.

c. Conclusion

Review and oversight functions required by TS Section 12.1.3 were acceptably completed by the RSC. No changes had been made at the facility since the last NRC inspection.

3. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the requirements of TS Section 12.2 were being met concerning written procedures:

- Procedure Approval Sheets
- Procedure Change Notice forms
- ARRR procedure review sign-off forms
- Section I of the ARRR Procedures Manual entitled, “Administrative Procedures,” PCN No. 2, RSC approval dated June 28, 1990, which detailed the process used to review, revise, and approve all facility procedures
- Section IV of the ARRR Procedures Manual entitled, “Critical Assembly and Power Calibration Procedures,” PCN No. 9, RSC approval dated November 6, 2012
- Section VI of the ARRR Procedures Manual entitled, “Radiological Safety Procedures,” PCN No. 5, RSC approval dated June 16, 2017

b. Observations and Findings

The inspector noted that procedures had been developed for reactor operations and safety as required by the TSs. The licensee’s procedures were found to be

dated but acceptable. The inspector noted that the administrative procedure specified the responsibilities of the RSC. The inspector verified that a designated member of the RSC had completed biennial reviews of the facility procedures as required. It was noted that the last review of all procedures had occurred on May 15, 2017. The inspector verified that various changes had been made to the Radiological Safety Procedures. These had been presented to the RSC for review and approval. The RSC Chair had approved the changes on June 16, 2017.

c. Conclusion

Changes to facility procedures satisfied TSs and administrative procedure requirements for being reviewed by the licensee and reviewed and approved by the RSC.

4. Operator Requalification

a. Inspection Scope (IP 69001)

To verify compliance with the Operator Requalification Program for the ARRR, which was submitted to the NRC on July 13, 2000, the inspector reviewed:

- Status of all qualified operators' licenses
- Operators' physical examination records for 2014 through 2016
- Senior Reactor Operator (SRO) Licensed Activities Log documenting completion of maintenance and surveillance activities and operator supervisory and related functions for 2016 and to date in 2017
- 2016 SRO Biennial Written Examinations and related records
- 2015 and 2016 SRO Annual Operating test results and related records

b. Observations and Findings

There were three employees who maintained an SRO license at the facility. The inspector verified that the SROs' licenses were current. Records showed that operators were given biennial requalification examinations and annual operations tests as required. Logs indicated that operators maintained active duty status as required by performing maintenance and the required calibrations of reactor components or by completing supervisory and related licensed operator duties. The Operator Requalification Program was being maintained up to date. The inspector also verified that the operators were reviewing the contents of all abnormal and emergency procedures on a regularly scheduled basis (annually) as indicated by a sign off sheet located in the emergency procedures folder. The inspector further verified that each operator was receiving a physical examination every two as required.

It was noted in Section II of the licensee's Operator Requalification Program that lectures were mentioned. The program required that, "preplanned lectures will be given a minimum of 4 hours per month on a continuous basis in areas where

operator and senior operator written exams and facility operating experience indicate a deficient knowledge in the subject matter." Because the SROs at the facility had scored at least 80 percent or better on their written and operating exams for the past seven years, the licensee determined that no one showed a deficiency in knowledge and, therefore, no lectures were required. Because the reactor had been shutdown since October 2010, the inspector agreed with this interpretation of the requirements of the Requalification Program. However, the inspector indicated that lectures should be given at some frequency despite the scores of the operators. The licensee proposed that, on a quarterly basis, a 4 hours of lecture would be given to all the SROs at the facility. The initiation of a quarterly 4 hours of lecture requirement proposed by the licensee will be considered appropriate during the period when the facility license and the Operator Requalification Program (and other facility documents and programs) are reviewed for license renewal. The 4 hours of lecture per quarter commitment proposed by the licensee as part of their Operator Requalification Program will be considered an Inspector Follow-up Item (IFI) and will be reviewed during the next inspection at the facility (IFI 50-228/2017-201-01).

c. Conclusion

Operator requalification was being conducted and completed as required by the Operator Requalification Program. Medical examinations for each operator were being completed biennially as required.

5. Maintenance and Surveillance

a. Inspection Scope (IP 69001)

To determine that maintenance and surveillance activities were being completed as required by TS Sections 3.0, 4.0, 5.0, 6.0, and 7.0, the inspector reviewed:

- ARRR Repair Folders for various instruments
- Operations Request Forms for 2016 and to date in 2017
- Monthly Alarm Check Lists for 2016 and to date in 2017
- ARRR Pool Water Analysis sheets for 2016 and to date in 2017
- Quarterly Instrument Calibration forms for 2016 and to date in 2017
- Quarterly Maintenance Check Lists for 2016 and to date in 2017
- Section VIII of the ARRR Procedures Manual entitled, "Maintenance Procedures," PCN No. 2, RSC approval dated January 14, 1993

b. Observations and Findings

(1) Maintenance

The various Repair Folders and Operations Request Forms maintained by the licensee indicated that emergent problems were addressed by appropriate corrective maintenance as needed. If electrical components for the nuclear instrumentation were replaced, the maintenance

procedures required that calibrations and voltage checks occur prior to the instrumentation being placed back into service. The inspector verified that these tests were completed as required. Records showed that routine maintenance activities were conducted at the required frequency and in accordance with the TSs and/or the applicable procedure.

(2) Surveillance

The inspector noted that the licensee's TSs did not contain a specific section stipulating what surveillances needed to be performed at the facility. However, the TSs did contain some requirements for certain checks and tests mostly dealing with experiments and radiation protection. Nevertheless, the inspector also noted that the licensee's procedures contained guidance and requirements concerning various calibrations and measurements that were to be performed. Specifically, the procedure entitled, "Critical Assembly and Power Calibration Procedures," in the ARRR Procedures Manual required in Section IV, Part B.3.d that, upon completion of the (element repositioning and addition) program, perform a reactivity loss to power measurement the first time the reactor is taken to power. Section IV, Part B.3.e required that, within one month of program completion, perform a calorimetric power level measurement. Section IV, Part C. required that the control rod calibrations are to be performed at least once a year and following each new significant change in reactor loading. Also, a new power level measurement is to be performed every 6 months. Section IV, Part C.2.c required that a new reactor power coefficient must be determined for each change in reactor core configuration.

Because the licensee had shutdown reactor operations in October 2010 and then had found fuel element damage in 2011 during a fuel inspection, and further fuel damage in 2012, all fuel and graphite elements had been removed from the core and placed in storage in the reactor pool. The licensee realized that it was not possible to perform the aforementioned tests as required. Therefore, they revised their procedure so that the tests would not be required until after the reactor core has been fully reassembled. This change had been reviewed and approved by the RSC as required.

After the reactor was shutdown in October 2010, the licensee continued to complete the various monthly, quarterly, and annual tests and calibrations as required. As noted above, the majority of the semiannual and annual surveillance items were not being completed because they required a functioning reactor. One annual surveillance involving fuel inspection has continued to be completed as required.

The inspector determined that the licensee had developed a checklist to ensure that appropriate oversight was maintained over the various maintenance and surveillance items and other activities. These included

items such as pool water pH and temperature levels, air filter change out, cycling the pumps, and limited reactor console checkouts. These items were checked and/or completed on a periodic basis even though this was not required because the reactor was shut down and not operating.

c. Conclusion

Maintenance was being completed in accordance with TSs and procedural requirements. The program for surveillance checks, tests, verifications, and calibrations was being implemented in accordance with TSs and procedural requirements.

6. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify compliance with the facility Emergency Plan (E-Plan), the inspector reviewed selected aspects of:

- Emergency response facilities, supplies, and instrumentation
- Quarterly Maintenance Checklists for 2016 and to date in 2017
- Emergency drill records for 2016 and to date in 2017 documented in the Monthly Alarm Check Lists
- Emergency response training for 2016 and to date in 2017 documented in the Training Log
- Offsite support as indicated in the current Letter of Agreement (LOA) with the ValleyCare Health System
- E-Plan implementing procedures, Section III of the ARRR Procedures Manual entitled, “General Emergency Procedures,” PCN No. 4, last revised January 28, 2005
- Emergency response requirements stipulated in American National Standards Institute/American Nuclear Society-15.16 – 1982 (R1988), “Emergency Planning for Research Reactors”

b. Observations and Findings

The E-Plan for the ARRR in use at the facility was the same as the version most recently approved by the NRC with the last revision dated January 14, 2005. The inspector verified that the E-Plan was audited and reviewed biennially as required. The licensee’s General Emergency Procedures were being reviewed annually by all licensed operators and revised as needed to implement the Plan effectively.

Through records review and interviews with staff personnel, emergency responders were determined to be knowledgeable of the proper actions to take in case of an emergency. Emergency response equipment was being maintained and calibrated and alarms were being tested at the frequency stipulated in the

E-Plan. Communications capabilities with the various offsite support groups were acceptable. The Notification List was maintained up to date by an alarm contractor, and verified by the licensee.

The inspector verified that emergency preparedness and response training for staff personnel was being completed annually as required. Evacuation drills had been conducted twice a year as required by the E-Plan.

The inspector reviewed the LOA that had been signed with the ValleyCare Health System which operated a hospital in nearby Pleasanton, CA. The LOA stated that the hospital would treat potential victims of a radiological event if such were to occur at the ARRR facility. The inspector verified that the hospital had been contacted and an updated LOA had been signed in December 2015 to ratify that the agreement remained in effect. The Fire Department was also being contacted annually to review emergency interface requirements as required. It was noted that Fire Department personnel had visited the facility on September 2, 2016, and January 26, 2017, for training and a tour.

c. Conclusion

The inspector concluded that the emergency preparedness program was conducted in accordance with the E-Plan because: (1) the E-Plan and procedures were being reviewed as required and updated as needed, (2) emergency response equipment was being maintained and alarms were being tested monthly as required, (3) the LOA with the local hospital had been signed, (4) evacuation drills were being conducted twice a year as required, and (5) emergency preparedness training for staff personnel was being completed as required.

7. Radiation Protection

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Part 20 and the requirements in TS Sections 6.2, 7.0, and 12.1.2:

- Dosimetry records for facility personnel for the past two years
- Radiological signs and posting at the entrances to controlled or restricted areas
- Calibration and periodic check records for portable and fixed radiation monitoring instruments
- Training Log records documenting radiological safety training for facility personnel from 2015 to the present
- Radiation protection and reactor surveillance and survey data from 2016 to the present recorded on:
    - Neutron Instrument Calibration forms
    - Swipe Count Sheet forms completed quarterly

  - ARRR Pool Water Analysis forms completed monthly
  - Air Filter Paper Counting Sheet forms completed weekly
  - Aerotest Operations, Inc. Monthly Radiation Survey forms
  - Aerotest Operations, Inc. Quarterly Instrument Calibration forms
  - Aerotest Operations, Inc. Quarterly Maintenance Check List forms
- Section VI of the ARRR Procedures Manual entitled, "Radiological Safety Procedures," PCN No. 5, RSC approval dated June 16, 2017
- Section VIII of the ARRR Procedures Manual entitled, "Maintenance Procedures," PCN No. 2, RSC approval dated January 14, 1993
- "ALARA and Radiation Protection Program for Aerotest Operations, Inc.," updated August 14, 2004

The inspector also observed the use of dosimetry and radiation monitoring equipment during tours of the facility including various offices, support areas, and the Reactor Bay and during shipment preparations.

a. Observations and Findings

(1) Surveys

Radiation and contamination survey results indicated that activities were being conducted in accordance with operating procedures. The inspector noted that the quarterly radiation surveys stipulated in the procedures were completed more frequently than required, i.e., typically every month. The results of the surveys were documented on the applicable forms and were evaluated as required.

(2) Postings and Notices

During tours of the facility, the inspector observed that caution signs, postings, and controls in the restricted or controlled areas were acceptable for the hazards involving radiation, high radiation, and radioactive material storage areas and were posted as required by 10 CFR Part 20, Subpart J. Radiological signs were typically posted at the entrances to controlled areas.

Copies of current notices to workers were posted in various areas in the facility including the hallway in the Reactor Bay just outside the Control Room. Other postings also characterized the industrial hygiene hazards that were present in the areas as well. The inspector noted that the copies of NRC Form-3, "Notice to Employees," posted at the facility as required by 10 CFR 19.11, were the current version.

(3) Dosimetry

The inspector determined that the licensee used thermoluminescent dosimeters (TLDs) for whole body monitoring of beta and gamma radiation exposure (with an additional component 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. An examination of the TLD results indicating radiological exposures at the facility for the past two years showed that everyone's occupational doses were well within 10 CFR Part 20 limitations.

(4) Radiation Monitoring Equipment

Examination of selected survey meters indicated that the instruments had the acceptable up-to-date calibration sticker attached. The instrument calibration records indicated calibration of portable survey meters was typically completed by licensee personnel and occasionally by a contractor. The inspector verified that the calibration of portable instruments was being verified quarterly as required by procedure. Calibration records were being maintained as required.

(5) Training

Training records showed that personnel were acceptably trained in radiation protection practices. Newly hired personnel were given individual training to acquaint them with radiation terminology, health risks, natural and work-related sources of radiation, and allowable limits. A test was given following the training to demonstrate that the individuals understood the material. Annual refresher training was provided to all staff members by the facility Radiation Safety Officer. The most recent refresher training sessions had been conducted on May 31, 2016, and April 11, 2017. It was noted that, in 2016, each radiation worker at the facility had completed on-line training and had completed a quiz following the training. A review of the topics covered during the training indicated that the appropriate material had been used.

(6) Radiation Work Permit Program

The inspector noted that the licensee had initiated a more extensive radiation work permit (RWP) program than they had had in the past at the facility. All visitors entering a Radiation Area at the facility were required to sign in on a specific RWP. Also, persons entering those areas received a Visitor Orientation and signed a form acknowledging the training.

(7) Documentation of the Radiation Protection and As Low As Reasonably Achievable Programs

The Radiation Protection Program was established and described in the ARRR Procedures Manual, Section VI, entitled "Radiological Safety Procedures," and in the ARRR Reactor Operator Training Manual, Volume 5, entitled "Radiological Safety." The program had not changed

since the last inspection. The licensee reviewed the Radiation Protection Program at least annually in accordance with 10 CFR 20.1101(c). The last review, which was completed August 17, 2016, included all areas of the program.

The as low as reasonable achievable (ALARA) Program was outlined in a licensee document entitled, "ALARA and Radiation Protection Program for Aerotest Operations, Inc." The program appeared to be adequate for the facility. The latest review of the ALARA Program was also completed in August 2016.

(8) Facility Tours

As noted above, the inspector toured the facility on various occasions and observed activities in offices, support areas, the Reactor Bay, and the mezzanine area. Through observations of, and interviews with, licensee staff and contractor personnel, the inspector confirmed that personnel complied with the signs, postings, and controls. The facility's radioactive material storage areas were noted to be properly posted. No unmarked radioactive material was detected in the facility.

c. Conclusion

The inspector determined that the Radiation Protection and ALARA Programs, as implemented by the licensee, satisfied regulatory requirements. Specifically, (1) surveys and associated checks were completed and documented acceptably to permit evaluation of the radiation hazards present; (2) postings met regulatory requirements; (3) personnel dosimetry was being worn and recorded doses were within the NRC's regulatory limits; (4) radiation survey and monitoring equipment was being maintained and calibrated as required; and, (5) radiation protection training was being conducted for facility personnel.

8. Environmental Monitoring

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with the requirements of 10 CFR Part 20 and TS Sections 3.1, 7.2, and 7.3:

- Environmental dosimetry records for the past two years
- Radioactive Liquid Waste Holding Tank release records
- Results listed on Air Filter Paper Counting Sheets for the past two years
- Section VI of the ARRR Procedures Manual entitled, "Radiological Safety Procedures," PCN No. 5, RSC approval dated June 16, 2017, outlining the licensee's environmental monitoring program

b. Observation and Findings

The inspector reviewed the calibration verification records of the area, water, and stack monitoring systems. The calibration of these systems had been checked semiannually in accordance with procedure. If a system failed verification, a full calibration was then conducted. The inspector also reviewed the records documenting the fact that, because the reactor had not been operated since 2010, there had been no liquid and airborne releases to the environment for that period. Through records review and interviews with licensee personnel, the inspector noted that the last time the licensee had released any waste water was in 2009. This was done under the controls specified by procedure and in accordance with the regulations.

On-site and off-site gamma radiation monitoring was completed using environmental TLDs in accordance with the applicable procedures. These data indicated that there were no measurable doses above any regulatory limits. Through observation of the facility, the inspector did not identify any new potential release paths.

c. Conclusion

Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and TS limits.

9. Transportation

a. Inspection Scope (IP 86740)

In order to verify compliance with the requirements of 10 CFR 71.5 for shipments of licensed material, the inspector reviewed the following:

- Personnel training records of facility and contractor personnel
- Shipping records for the radioactive waste being shipped and the containers during the course of the inspection
- Surveys of the loaded waste containers and the loaded SeaLand containers

The inspector also interviewed licensee personnel and contractor personnel regarding shipments of radioactive material and performed independent radiation surveys of various items and containers.

b. Observations and Findings

During this inspection, the inspector observed the preparations and actions taken to ship radioactive waste from the site. The waste consisted of spent resin, dry active waste, other activated items, and two galvanized steel Waste Water Hold-up Tanks. The tanks had been used for many years and were old and rusted in some places. This condition could have eventually led to a possible unmonitored release to the environment. However, this problem was resolved

when the licensee installed two new polyethylene Waste Hold-up Tanks in March 2015. Therefore, the two old hold-up tanks were no longer needed. The licensee hired an experienced vendor, Energy Solutions, to help with the shipment of all these items.

The inspector observed as the tanks were surveyed and then loaded onto a large SeaLand container. The tanks were braced and strapped in place. Various containers of radioactive waste material were surveyed and then loaded behind the tanks. These were also secured in place so nothing would move during transit. The spent resin, which was contained in several steel drums, was surveyed and loaded into a separate shielded (and somewhat smaller) SeaLand container. They too were braced and secured in place. As noted above, all the containers, drums, and tanks had been surveyed for loose surface contamination and surveyed to determine their radiation levels. All the radioactive waste containers had been labeled prior to being secured in the SeaLand containers. Once the containers were loaded, they were placarded as required. A waste manifest was then prepared for each SeaLand container and shipping surveys were completed of the containers and the truck. It appeared that everything required for shipping radioactive waste was done as required by the regulations.

Staff and contractor personnel interviews and records reviews showed that licensee's program for transportation of radioactive material, augmented by the contractor's program, was adequate. The inspector noted that three staff members had received the training for shipping radioactive material and/or dangerous goods as required. The training and qualifications of the contractor personnel were also reviewed and these individuals were determined to be properly trained and adequately qualified to handle radioactive material and conduct radioactive waste shipments.

c. Conclusion

The program for transportation of radioactive materials satisfied NRC requirements. The shipment of radioactive waste from the facility was completed according to the applicable regulations.

10. Exit Meeting Summary

The inspector reviewed the inspection results with members of licensee management at the conclusion of the inspection on June 21, 2017. 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 Personnel

C. Bauman	Nuclear Engineer and Senior Reactor Operator
F. Meren	Reactor Supervisor and Reactor Operations Manager
T. Richey	Neutron Radiography Manager
S. Warren	General Manager and Radiological Safety Officer
M. Wilkinson	Quality Assurance Manager

Other Personnel

M. Bertram	Driver, Hitman Transport Services
M. Cambra	Radioactive Material Specialist and team member, Energy Solutions
L. Conway	Director of Naval Programs and Site Operations, Energy Solutions
M. Phillips	Radioactive Material Shipping Broker and team member, Energy Solutions
R. Swartz	Heavy Equipment Operator and team member, Energy Solutions

INSPECTION PROCEDURE USED

IP 69001	Class II Non-Power Reactors
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-228/2017-201-01	IFI	Follow-up on the commitment proposed by the licensee to conduct 4 hours of lecture per quarter as part of the Operator Requalification Program.

Closed

None

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ARRR	Aerotest Radiography and Research Reactor
CFR	*Code of Federal Regulations*
E-Plan	Emergency Plan
IP	Inspection Procedure
LOA	Letter of Agreement
NRC	U.S. Nuclear Regulatory Commission
PCN	Procedure Change Notice
RSC	Reactor Safeguards Committee
SRO	Senior Reactor Operator
TSs	Technical Specifications