

December 6, 2010

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

SUBJECT: AEROTEST OPERATIONS, INC. – NRC NON-ROUTINE INSPECTION
REPORT NO. 50-228/2010-203

Dear Ms. Warren:

On November 8-10, 2010, the U. S. Nuclear Regulatory Commission (NRC, the Commission) completed an inspection at your Aerotest Radiography and Research Reactor facility (Inspection Report No. 50-228/2010-203). The enclosed report documents the inspection results which were discussed on November 10, 2010, with you and other 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 activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

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

Should you have any questions concerning this inspection, please contact Craig Bassett at (404) 358-6515 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/

Johnny H. Eads, Jr., 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: NRC Inspection Report No. 50-228/2010-203
cc w/encl: See next page

Aerotest Operations, Inc.

Docket No. 50-228

cc w/encl:

Dario Brisighella, President
Aerotest Operations, Inc.
Autoliv
3350 Airport Road
Ogden, UT 84405

Fred Meren, Reactor Supervisor
Aerotest Operations, Inc.
3455 Fostoria Way
San Ramon, CA 94583

California Energy Commission
1516 Ninth Street, MS-34
Sacramento, CA 95814

Radiological Health Branch
P.O. Box 997414, MS 7610
Sacramento, CA 95899-7414

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

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NAME	CBassett	GLappert	JEads
DATE	11/12/2010	11/30/2010	12/6/10

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

Docket No: 50-228

License No: R-98

Report No: 50-228/2010-203

Licensee: Aerotest Operations, Inc.

Facility: Aerotest Radiography and Research Reactor

Location: 3455 Fostoria Way
San Ramon, CA 94583

Dates: November 8-10, 2010

Inspector: Craig Bassett

Approved by: Johnny H. Eads, Jr., 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: 50-228/2010-203

The primary focus of this non-routine, announced inspection was the onsite review of selected aspects of the Aerotest Operations, Inc. (the licensee's) 250 Kilowatt (250 kW) Class II research reactor safety program including: 1) organizational structure and staffing; 2) conformance to License conditions and Technical Specification requirements, 3) radiation protection, 4) environmental monitoring; 5) security, and 6) material control and accounting since the last NRC inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety, and in compliance with the U. S. Nuclear Regulatory Commission (NRC) requirements. No violations or deviations were identified.

Organizational Structure and Staffing

- The Aerotest Radiography and Research Reactor organization and staffing met the requirements specified in the Technical Specifications.
- All hourly personnel at the facility had been laid off and only salaried personnel remained.

Conformance to License Conditions and Technical Specification Requirements

- License conditions were being met.
- Technical Specification requirements were being completed.

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* (10 CFR) Section 19.12.
- The Radiation Protection and As Low As Reasonably Achievable (ALARA) Programs satisfied regulatory requirements.

Environmental Monitoring

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

Operator Requalification

- 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.

Security

- Security facilities, equipment, and procedures satisfied the Physical Security Plan requirements.

Material Control and Accounting

- Special nuclear material was acceptably controlled and tracked as required by 10 CFR Part 70.

Emergency Preparedness

- The current facility Emergency Plan and implementing procedures were being reviewed biennially as required and updated as needed.
- Emergency response equipment was being maintained and alarms were being tested periodically as required.
- The Letter of Agreement with the local hospital 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.

REPORT DETAILS

Summary of Plant Status

Aerotest Operations, Inc. (Aerotest, the licensee) had ceased to operate the 250 kilowatt (kW) TRIGA Conversion research reactor on October 15, 2010. In the past the reactor had been operated to support neutron radiography, surveillance, and reactor operator training. During this inspection, the reactor was not started up or operated.

1. Background Information

In 2000, Aerotest Operations, Inc. was a wholly-owned subsidiary of OEA, Aerospace Inc. OEA Aerospace, Inc. was a wholly-owned subsidiary of OEA, Inc. Subsequently, in a 100% stock purchase, Autoliv, Inc. bought OEA, Inc., including Aerotest Operations. Autolive, Inc. was a publicly-traded Delaware corporation headquartered in Stockholm, Sweden and traded on the New York Stock Exchange. On May 5, 2000, Aerotest reported this sale to the NRC. NRC determined that Autoliv was a foreign-owned company and ordered divestiture of OEA, Inc., and Aerotest Operations, Inc. OEA was sold to a U.S. based corporation but that corporation declined to buy Aerotest. The NRC and Aerotest developed a plan whereby Autoliv would divest itself of at least 1-5% of Aerotest and provide the NRC a semiannual report on progress to sell the remainder of the company. During the years from about 2002 through 2008, various companies were initially interested in buying Aerotest but none did so.

In February of 2005, Aerotest submitted an application for license renewal. In February of 2008, the President of Aerotest Operations, Inc. retired and a new president was named by Autoliv. On July 9, 2009, Aerotest was informed by the NRC that, due to concerns regarding the degree of foreign ownership of Aerotest's ultimate parent (Autoliv), the NRC would deny Aerotest's application for license renewal. During the next several months, Aerotest worked with the NRC, other government agencies, and private parties to structure a transaction that would allow Aerotest to continue operations. In early 2009 Aerotest negotiated a letter of intent for the transfer of the facility to another non-destructive testing company.

On July 6, 2010, the NRC issued an order that approved the transfer of the license to operate the Aerotest facility if Aerotest and the potential transferee could complete the transaction prior to September 13, 2010. However, due to various uncertainties involving the future disposition of the spent fuel and the costs involved, the potential transferee declined to proceed with the transaction. Aerotest also submitted a proposal to the Department of Defense to allow the facility to continue to operate. That proposal was not acceptable to the Department of Defense and Aerotest voluntarily ceased operating the research and test reactor on October 15, 2010.

2. Organizational Structure 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 Sections 10.0 and 12.1 of the facility Technical Specifications (TS), Change No. 8, dated October 22, 1974, were met:

- Management and staff responsibilities
- Aerotest Operations, Inc. organizational structure
- Section II of the Aerotest Radiography and Research Reactor (ARRR) Procedures Manual entitled, "Operating Procedures," Procedure Change Notice (PCN) Number (No.) 2, Reactor Safeguards Committee (RSC) approval dated June 28, 1990
- Annual Summary of Changes, Tests, and Experiments at Aerotest Radiography and Research Reactor (ARRR) for the period from July 1, 2008, to June 30, 2009, issued July 15, 2009
- Annual Summary of Changes, Tests, and Experiments at Aerotest Radiography and Research Reactor (ARRR) for the period from July 1, 2009, to June 30, 2010, issued July 15, 2010

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities at the facility had not changed since the previous NRC inspection of radiation protection in April 2008 (NRC Inspection Report Number 50-228/2010-201). The inspector noted that the General Manager was the local official in charge of day-to-day operations 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 TS. The General Manager and the Reactor Supervisor reported to the President, Aerotest Operations, Inc.

Through review of records and discussions with licensee personnel, the inspector determined that the current staffing at the facility had been cut due to the failure of the parent company to sell Aerotest and continue operations (see Paragraph 1 above). All of the hourly personnel had been laid off and only the salaried personnel remained. The salaried employees were performing clean-up of the facility and were conducting maintenance and surveillance duties as required by the TS.

c. Conclusion

The licensee's organization was as specified in the TS. All hourly personnel had been laid off and only salaried personnel remained at the facility.

3. Conformance to License Conditions and Technical Specification Requirements

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the licensee was meeting certain license conditions and complying with various TS requirements:

- RSC Charter dated March 17, 1978
- Fuel movement and examination records
- RSC meeting minutes for the past two years
- Reactor Period Data Sheets for the past two years
- Fuel handling equipment and reactor instrumentation
- Various records and data sheets related to fuel movement
- Selected ARRR Operational Log Sheets for the past two years
- Monthly Alarm Check Lists for 2008, 2009, and to date in 2010
- Operations Request Forms – Numbers 09-702 through 10-709
- ARRR Pool Water Analysis sheets for 2009 and to date in 2010
- Control Rod Calibration - Rod Drop Data Sheets (Graphic Version)
- Data Sheets for Fuel and Graphite Transfer forms for 2008 and 2009
- Quarterly Maintenance Check Lists for 2008, 2009, and to date in 2010
- Selected ARRR Startup/Shutdown Sheets for 2009 and to date in 2010
- TS defined duties of the RSC including the review and audit functions
- Section I of the ARRR Procedures Manual entitled, “Administrative Procedures,” PCN No. 2, RSC approval dated June 28, 1990
- Section II of the ARRR Procedures Manual entitled, “Operating Procedures,” PCN No. 2, RSC approval dated June 28, 1990
- Section IV of the ARRR Procedures Manual entitled, “Critical Assembly and Power Calibration,” PCN No. 7, RSC approval dated November 2, 2005
- Section VIII of the ARRR Procedures Manual entitled, “Maintenance Procedures,” PCN No. 2, RSC approval dated January 14, 1993

The inspector toured the facility on various occasions and observed activities in offices, support areas, the Reactor Bay, and the mezzanine area. The inspector also toured the area inside the fence surrounding the facility.

b. Observations and Findings

(1) License Conditions

License Conditions of the Aerotest Operations, Inc., Facility Operating License No. R-98, Paragraph 2.B.(2) and (3) stipulated that the licensee may possess up to 5.0 kilograms of contained uranium 235 in connection with operation of the reactor and possess a 2 curie americium-beryllium neutron startup source.

Through records review and discussions with licensee personnel the inspector verified that the licensee had approximately 4.2 kilograms of U-235 and possessed an americium-beryllium start-up source as allowed.

(2) Technical Specification Requirements

(a) TS Section 2 – Reactor Site

TS Section 2 required that there be a locked, steel perimeter fence surrounding the facility, forming an exclusion area.

The inspector toured the exterior of the Reactor Building and fenced area of the facility. The fence was being maintained as required and was locked at all times except for entry by staff or during periods when deliveries were received or shipments were made. (Also see Paragraph 7 below for more information.)

(b) TS Section 3 – Reactor Building

TS Section 3 required that the reactor be housed in a steel building with various capabilities.

The inspector toured the Reactor Building and verified that all circulating fans and air conditioning systems except that which supplied air to the Control Room had the capability to be shut off from a single control which was located in the Control Room. A positive air pressure was being maintained in the Control Room with respect to the Reactor Room. An alarm system had been installed and was being tested periodically to detect unauthorized entry into the Reactor Building.

(c) TS Section 4 – Reactor Pool

TS Section 4 required that the primary system have various capabilities.

Through records review and interviews with licensee personnel, the inspector determined that there was an instrument in the reactor pool to monitor the depth of the water and that it would alarm if the level fell below 16 feet above the top of the core. The temperature of the pool water was monitored and the water was cooled as needed. The inspector verified that the licensee had plans in place to maintain the pool water temperature above 60° Fahrenheit in the eventuality that the water ever reached a temperature below that limit. Also, the pH and conductivity of the primary coolant was being measured once each month as required.

(d) TS Section 5 – Reactor Core

TS Section 5.1, “Fuel Elements,” required that the reactor contain no more than 90 TRIGA type fuel elements and that the maximum excess reactivity did not exceed a specified amount.

Through records review and interviews with the licensee, the inspector verified that the reactor core contained 87 fuel elements with a total U-235 loading of less than 3.3 kilograms (kg). In addition, every quarter the licensee verified that the maximum excess reactivity was less than 3 dollars.

TS Section 5.3, “Control Elements,” required that the reactor was subcritical by a minimum margin, that there were a minimum of three operable control elements, and that the insertion time for the control rods be less than a specified amount.

Through records review and interviews with the licensee, the inspector determined that the licensee verified on a quarterly basis that the reactor was subcritical by a minimum margin of 0.50 dollars when the maximum worth rod is fully withdrawn. The licensee also verified that there were a minimum of three operable control elements prior to reactor operation. The licensee also conducted a quarterly check to verify that the total insertion time for the control rods was less than 600 milliseconds.

(e) TS Section 6 – Reactor Safety Systems

TS Section 6.4 required that reactor sequence, interlocks and safety circuits remain operable while the fuel was in the core. TS Section 6.7 required that process instrumentation with readout in the Control Room be operating to permit continuous indication of pool water temperature and conductivity and that there be alarms to indicate low water flow, low pool water, and improper location of the bridge crane.

Through records review, observations, and interviews with the licensee, the inspector verified that the licensee continued to maintain the reactor safety systems in operating order and that process instrumentation was functioning to indicate pool water temperature and conductivity. Alarms were operable to indicate low water flow, low pool water, and improper crane bridge location and were being checked quarterly.

(f) TS Section 7 – Radiation Monitoring

TS Section 7 required that there be a radiation monitoring system with various capabilities.

Through records review, observations, and interviews with the licensee, the inspector verified that there was a fixed gamma monitor located on the wall connecting the Control Room and the Reactor Room. The monitor had the required range and the annunciation and siren actuation of the system was tested monthly. A fission product water monitor was attached to the process water clean-up system with continuous indication in the Control Room. The licensee had portable survey instrument for measuring beta-gamma dose rates and portable instruments for measuring fast and thermal neutron dose rates. Dosimeters were placed at various locations within the Reactor Building for post-accident radiation analysis. All the monitors and instruments were being calibrated as required.

Also, see Paragraph 3 below for further information on the radiation monitoring system and the radiation protection program at the facility.

(g) TS Section 11 – Fuel Storage and Transfer

TS Section 11 required that the licensee store fuel in specific locations and transfer fuel only under certain conditions.

Through records review, observations, and interviews with the licensee, the inspector verified that the licensee was not storing fuel in the floor of the Reactor Room as allowed. All fuel was stored in a locked vault or in the reactor tank. The fuel handling tool was locked in a specified location under the cognizance of the Reactor Supervisor. Not more than one fuel element was allowed in the facility which was not in storage or in the core lattice.

(h) TS Section 12 – Administrative Requirements

TS Sections 12.1.1 and 12.1.2 outlined the responsibilities of the Reactor Supervisor and the Radiological Safety Officer.

See Paragraph 1 above for details concerning these positions.

TS Section 12.1.3 detailed the composition of the Reactor Safeguards Committee, specified the meeting frequency, and outlined the responsibilities of the group including auditing operations and reviewing proposed modifications.

The inspector reviewed the RSC meeting minutes from November 2008 through the present. The minutes showed that the RSC met annually as required and considered the types of topics outlined by the TS, including as low as reasonably achievable (ALARA) challenges faced by the facility. The inspector determined that the review functions required by the TS were being completed by the

RSC. Through records review the inspector noted that the RSC membership satisfied the TS requirements and the Charter stipulations.

The inspector noted that two members of the RSC had completed annual unannounced audits of various aspects of the reactor facility operations and programs as stipulated in the TS. The audit for 2009 was completed on August 17, 2009, and the audit for 2010 was completed on September 28, 2010. The audits, as well as the resulting findings, were appropriate and the licensee's response and corrective actions, if needed, were acceptable.

Through review of applicable records, which included the latest Operations Request Forms, and through interviews with licensee personnel, the inspector determined that no changes had been initiated and/or completed at the facility since the last NRC inspection. It was noted that, on various occasions, different items of equipment were found to be defective following a check out or test. These items had been replaced with spares of the same make/design that were typically maintained on hand at the facility.

The inspector verified that the licensee was aware that changes or modifications to the facility were required to be analyzed by the staff and the results of the analyses presented to the RSC. Following a review, the RSC would then approve them if the changes or modifications were determined to be acceptable.

c. Conclusion

The licensee was meeting the License Conditions. Technical Specification requirements were being completed.

4. Radiation Protection Program

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with Title 10 of the *Code of Federal Regulations* (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
- Radiation protection and reactor surveillance and survey data from 2009 to the present recorded on:
 - Swipe Count Sheet forms
 - ARRR Pool Water Analysis forms

- Neutron Instrument Calibration forms
- Air Filter Paper Counting Sheet forms
- Aerotest Operations, Inc. Monthly Radiation Survey forms
- Aerotest Operations, Inc. Survey Instrument Calibration forms
- Aerotest Operations, Inc. Quarterly Maintenance Check List forms
- Section VI of the ARRR Procedures Manual entitled, "Radiological Safety Procedures," PCN No. 3, RSC approval dated April 29, 1996
- 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 and last reviewed August 14, 2009

b. Observations and Findings

(1) Surveys

Radiation and contamination survey results indicated that licensed activities were being conducted in accordance with operating procedures. The inspector noted that the quarterly radiation surveys 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 contamination 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 Part 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 (Radiation Detection Co.). An examination of the TLD results indicating radiological exposures at the facility for the past two years showed that the highest

occupational doses, as well as doses to the public, were within 10 CFR Part 20 limitations. The records showed that the highest annual whole body exposure received by a single individual for 2009 was 3,057 millirem (mr) deep dose equivalent (DDE). The highest annual extremity exposure for 2009 was 22,612 mr shallow dose equivalent (SDE) and the highest skin or other shallow dose was 3,015 mr SDE. The highest annual whole body exposure received by a single person through September in 2010 was 2,898 mr DDE. The highest annual extremity exposure for 2010 was 18,262 mr SDE and the highest skin or other shallow dose was 2,921 mr SDE.

The inspector verified that NRC Form-5 reports had been completed and provided to each employee who had received exposure at the facility during 2009. It was noted that the annual radiation safety training for facility personnel had been completed January 6, 2010.

(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) Facility Tours

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, 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 because:

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.

5. Effluent and 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:

- Air Filter Paper Counting Sheets for the past two years
- Environmental dosimetry records for the past two years
- Radioactive Liquid Waste Holding Tank release records
- Selected ARRR Operations Log Sheets for the past two years
- Section VI of the ARRR Procedures Manual entitled, "Radiological Safety Procedures," PCN No. 3, RSC approval dated April 29, 1996, outlining the licensee's environmental monitoring program

b. Observation and Findings

(1) Liquid and Airborne Releases

The inspector reviewed the calibration records of the area, water, and stack monitoring systems. These systems had been calibrated semiannually in accordance with procedure. The inspector also reviewed the records documenting liquid and airborne releases to the environment for the past two years. Gaseous releases were monitored as required by TS and the amount of Argon-41 released per year was calculated. The results indicated that the releases were within 10 CFR, Appendix B, Table 2 concentrations, and TS limits.

To demonstrate compliance with the annual dose constraints of 10 CFR 20.1101(d), the licensee used the COMPLY computer code. The highest calculated dose that could be received by a member of the public as a result of gaseous emissions from reactor operations was 1.8 E-2 millirem per year (mr/yr) for 2008 and 1.5 E-2 mr/yr for 2009. These doses were well below the 10 mr/yr limit set in 10 CFR 20.1101(d).

As documented in NRC Inspection Report 50-228/2010-201, the licensee had released approximately 2,000 gallon of wastewater that had been stored in two Radioactive Liquid Waste Holding Tanks on site. Prior to the release the water had been sampled and the activity documented. During the release, the water was commingled and diluted with other process water as it left the site and entered the sanitary sewer system. The General Manager had reviewed and approved the release after the appropriate water samples were analyzed and the results indicated that the release would meet regulatory requirements for such a discharge. Prior to the actual release of liquid, the results of the sample analyses were also reviewed and verified by the Central Contra Costa Sanitary District, State of California. The Sanitary District then approved the release.

(2) Gamma Radiation Monitoring

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.

6. Operator Requalification Program

a. Inspection Scope (IP 69001)

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

- Status of all qualified operators' licenses
- Operator physical examination records for 2008 and 2010
- Selected ARRR Operational Log Sheets documenting reactivity manipulations
- 2008 Senior Reactor Operator Biennial Written Examinations and related records
- 2007 and 2008 Senior Reactor Operator Annual Operating Exam results and related records

b. Observations and Findings

There were three people who maintained SRO licenses at the facility. The inspector noted that two other individuals were participating in the licensee's training program to become licensed operators. It was also noted that these individuals had participated in on-the-job training and had signed the Operations Logs on several occasions as Operator Trainees.

The inspector verified that the SROs' licenses were current. Records showed that operators were given biennial requalification examinations and annual operations tests as required. It was noted that the next biennial examinations were scheduled to be administered during the third week in November 2010 and the licensee planned to complete that schedule.

Logs indicated that operators had maintained active duty status as required by operating the reactor the required number of hours quarterly and by completing the required number of reactivity manipulations. The inspector also verified that the operators were reviewing the contents of all abnormal and emergency procedures on a regularly scheduled basis as indicated by a sign off sheet located in the emergency procedures folder.

The inspector determined that the Operator Requalification Program was being maintained up to date and that the operators were current in their training and would be considered current through the end of the year. In March 2011, if the reactor remained in a non-operating condition, they would fall into an "inactive" status. In order to be reclassified as being "active," each operator would need to be certified by an authorized representative of the facility that their qualifications and status were current and that each reactor operator had completed a minimum of 6 hours of licensed functions under the direction of an operator or senior operator as appropriate prior to resuming licensed activities.

The inspector further verified that two of the operators had received a biennial physical examination in 2010 as required. The third operator was scheduled to receive a physical examination in December. That licensee planned to ensure that that physical was completed as required.

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.

7. Security

(1) Inspection Scope (IPs 81401, 81402, 81431, 81810)

The inspector reviewed the following to verify compliance with Section 3.2 of the Technical Specifications (TS) and with the licensee's NRC-approved Physical Security Plan (PSP) entitled, "Aerotest Radiography and Research Reactor Security Plan," last revised January 7, 2005:

- Key and access controls currently in effect
- Emergency detection devices and physical barriers
- Records documenting the annual security refresher training
- Monthly Alarm Check List forms for 2008 through October 2010
- "Emergency Plan for the Aerotest Radiography and Research Reactor," last revised January 14, 2005, and last reviewed May 15, 2008
- Section III of the Aerotest Radiography and Research Reactor (ARRR) Procedures Manual entitled, "General Emergency Procedures," PCN No. 4, Reactor Safeguards Committee approval dated January 28, 2005
- Section V of the ARRR Procedures Manual entitled, "Security Procedures," PCN No. 3, RSC approval dated February 11, 2005
- Section VIII of the ARRR Procedures Manual entitled, "Maintenance Procedures," PCN No. 2, RSC approval dated January 14, 1993
- "ARRR Fingerprint Program," issued May 15, 2007 and last reviewed May 15, 2009

b. Observations and Findings

The PSP in use by the licensee was the same as the version approved by the NRC. That version was dated January 7, 2005, and had last been reviewed on May 17, 2010. The PSP was being reviewed biennially as required and annual security training was completed as stipulated by the PSP. Implementing procedures were consistent with the PSP. Acceptable security response and training were demonstrated through alarm response and drill response in accordance with procedures. The most recent security refresher training was completed on January 6, 2010.

The inspector observed that the licensee was properly controlling and protecting the PSP and other safeguards information as required by the regulations. Through records review and interviews with licensee personnel, the inspector verified that there had been no safeguards events at the facility since the last inspection.

The physical protection system, consisting of barriers, alarms, equipment, and instrumentation, was as stipulated in and required by the PSP. The system was being maintained and tested periodically as required by procedure. Access controls were implemented as required and keys to the various facility doors were controlled and held only by designated personnel. The inspector observed as the General Manager conducted an inventory of the various keys for the facility. The keys were all present or in the possession of the assigned personnel.

The inspector verified that Local Law Enforcement Agency (LLEA) assistance, if needed, would continue to be provided by the Contra Costa County Sheriff's Department and the California State Highway Patrol. Support in the event of a fire would be provided by San Ramon Fire Protection District personnel. As directed by the Contra Costa County Sheriff's Dispatch Office, members of the police force from either San Ramon or Danville provided periodic patrols of the facility and would, along with the Fire Department, provide initial response to incidents at the reactor.

In May 2010, the inspector had visited the offices of the security alarm contractor, Denalect Alarm, and observed a test of the alarm system. The alarm response test provided a practical and effective check of the system and demonstrated the responsiveness of the contractor personnel. The inspector verified that the contractor had the current telephone numbers to call in case of an emergency and that the proper licensee personnel and/or support organizations would be notified according to the predetermined protocol.

c. Conclusion

Security facilities, equipment, training, and procedures satisfied PSP requirements.

8. Material Control and Accounting

a. Inspection Scope (IP 85102)

To verify compliance with TS Sections 5.1.1 and 11.1 and with 10 CFR Part 70, the inspector reviewed selected aspects of:

- Control of Special Nuclear Material (SNM) storage areas
- "ARRR SNM Inventory" forms documenting annual inventory results
- "ARRR SNM Control Manual," issued May 15, 2007 and last reviewed November 24, 2008
- Reactor core configuration documented on Figure II of the "Critical Assembly and Power Calibration Procedure"
- Accountability records and fuel storage locations documented on forms entitled, "Data Sheet for Fuel and Graphite Transfer"
- Nuclear Material Transaction Reports and Material Balance Reports (DOE/NRC Forms 741 and 742) from January 2008 through January 2010
- Section IV of the ARRR Procedures Manual entitled, "Critical Assembly and Power Calibration Procedures," PCN No. 7, RSC approval dated November 2, 2005

b. Observations and Findings

The records reviewed by the inspector showed that the licensee was maintaining control of SNM as required. The records also indicated that a physical inventory of all SNM at the facility was performed annually as required by 10 CFR 70.51(d).

The inspector also determined that the licensee submitted Nuclear Material Transaction Reports (DOE/NRC Form 741) and Material Balance Reports (DOE/NRC Form 742) and/or the required data on storage disk to the appropriate agencies at the frequency and as required by 10 CFR 74.13(a)(1).

The inspector reviewed the ARRR SNM Control Manual which formed the basis for the licensee's material control and accountability program. The inspector determined that the licensee tracked the locations and the content of irradiated and unirradiated fuel elements, fission foils, and sources maintained under the R-98 license. The inspector verified that the licensee maintained an amount of SNM that was less than that authorized by the license. Fuel burn-up related measurements and calculations were found to be acceptable and properly documented. Fuel inventory and movement forms were maintained and completed as required.

During the inspection, the inspector toured the facility, examined the SNM and fuel storage areas, and verified that the licensee was using and storing SNM in those areas designated for such use in the Physical Security Plan. All the SNM, including the fuel elements, were being maintained in the appropriate locations as indicated on the applicable licensee records. The fuel was being stored securely as required. The inspector noted that the licensee had received 15 new fuel elements in 2008. The appropriate forms had been completed and submitted as required.

c. Conclusion

The licensee was acceptably controlling and tracking SNM as required by 10 CFR Part 70.

9. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify compliance with the facility Emergency Plan, the inspector reviewed selected aspects of:

- Emergency response facilities, supplies, and instrumentation
- Quarterly Maintenance Check Lists for 2008, 2009, and to date in 2010
- Emergency drill records for 2009 and 2010 documented in the Monthly Alarm Check Lists
- Emergency response training for 2008, 2009, and 2010 documented in the Training Log
- Offsite support as indicated in the current Letter of Agreement with the Valley Care Health System
- Emergency 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 ANSI/ANS 15.16 – 1982 (R1988), "Emergency Planning for Research Reactors"

b. Observations and Findings

The Emergency Plan for the Aerotest Radiography and Research Reactor 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 Emergency Plan (E-Plan) was audited and reviewed biennially as required and was last reviewed in May 17, 2010. E-Plan implementing procedures were also reviewed and revised as needed to implement the Plan effectively.

Through records review and through 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 facility emergency Notification List was maintained up to date by the alarm contractor, Denalect, 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 Letter of Agreement (LOA) that had been signed with the Valley Care 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 annually as required to ensure that the LOA remained in effect and to verify facility readiness. The Fire Department was also being contacted annually to review emergency interface requirements as required.

c. Conclusion

The emergency preparedness program was conducted in accordance with the Emergency Plan as exemplified by the following: 1) the Emergency Plan and implementing procedures were being reviewed biennially as required and updated as needed, 2) emergency response equipment was being maintained and alarms were being tested monthly as required, 3) the Letter of Agreement with the local hospital was being verified annually as needed, 4) evacuation drills were being conducted twice a year as required, and 5) emergency preparedness training for staff personnel was being completed as required.

10. Exit Interview

The inspection scope and results were summarized on November 10, 2010, with members of licensee management. The inspector described the areas inspected and discussed the inspection findings. No dissenting comments were received from the licensee. Although proprietary information was reviewed during the inspection, no such material is included in this report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

C. Bauman	Research and Development Manager
A. Meren	Reactor Supervisor and Reactor Operations Manager
T. Richey	Neutron Radiography Manager
C. Schmidt-Mulcahy	Office Manager
S. Warren	General Manager and Radiological Safety Officer
M. Wilkinson	Quality Assurance Manager

INSPECTION PROCEDURES 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
IP 85102:	Material Control and Accounting - Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

ALARA	As low as reasonably achievable
ARRR	Aerotest Radiography and Research Reactor
10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
DDE	Deep dose equivalent
IP	Inspection Procedure
kW	kilowatt
mr/yr	millirem per year
mr	millirem
No.	Number
NRC	Nuclear Regulatory Commission
PCN	Procedure Change Notice
RSC	Reactor Safeguards Committee
SDE	Shallow dose equivalent
TLD	Thermoluminescent dosimeter
TS	Technical Specification