

September 6, 2002

Mr. Ray Tsukimura, President
Aerotest Operations, Inc.
3455 Fostoria Way
San Ramon, CA 94583

SUBJECT: NRC INSPECTION REPORT NO. 50-228/2002-201

Dear Mr. Tsukimura:

This letter refers to the inspection conducted on August 26-29, 2002, at your Aerotest Radiography and Research Reactor facility. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

Various aspects of your safety program were inspected including selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress. Based on the results of this inspection, no safety concerns or noncompliances of NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this letter, please contact Mr. Craig Bassett at (404)562-4712.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-228
License No. R-98

Enclosure: NRC Inspection Report

cc w/encl: Please see next page

cc w/encl:

Director, Energy Facilities Siting Division
Energy Resources Conservation & Development Commission
1516 9th Street
Sacramento, CA 95814

California Department of Health
ATTN: Chief, Environmental Radiation Control Unit
Radiologic Health Section
714 P Street, Room 498
Sacramento, CA 95814

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

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

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U.S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-228

License No: R-98

Report No: 50-228/2002-201

Licensee: Aerotest Operations, Inc.

Facility: Aerotest Radiography and Research Reactor Facility

Location: 3455 Fostoria Way
San Ramon, CA 94583

Dates: August 26-29, 2002

Inspector: Craig Bassett

Approved by: Patrick M. Madden, Section Chief
Research and Test Reactors Section
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Aerotest Operations, Inc.
Aerotest Radiography and Research Reactor (ARRR)
Report No: 50-228/2002-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the licensee's Class II non-power reactor operation including: organization and staffing, review and audit functions, procedures, radiation protection and ALARA, effluent and environmental monitoring, shipment of radioactive material, safeguards and security, and material control and accounting since the last NRC inspection of this facility.

Changes, Organization, and Staffing

- The ARRR organization and staffing met the requirements specified in the Technical Specifications.

Review and Audit Functions

- The Reactor Safeguards Committee conducted audits in compliance with the requirements specified in the Technical Specifications.

Procedures

- Facility procedures were acceptable, satisfied Technical Specifications requirements for revision by the licensee, and were reviewed and approved by the Reactor Safety Committee as required.

Radiation Protection Program

- Surveys and analyses were completed and documented acceptably to permit evaluation of the radiological conditions present in the facility.
- Radiation monitoring equipment was maintained and calibrated as required.
- Notices and postings at entrances to work areas met the regulatory requirements.
- Personnel dosimetry was worn as required and doses were within the licensee's procedural action levels and NRC's regulatory limits.
- Training was provided as required covering the topics outlined in 10 CFR 19.12.
- The Radiation Protection and ALARA Programs satisfied regulatory requirements.

Effluent and Environmental Monitoring

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

-4-

-2-

Transportation of Radioactive Materials

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

Safeguards and Security

- The NRC-approved security program was acceptably carried out at the facility and conformed to NRC and the licensee's Physical Security Plan requirements.

Material Control and Accountability

- The licensee's program for control and accountability of special nuclear material was acceptable.

REPORT DETAILS

Summary of Plant Status

The licensee's TRIGA research reactor continued to be operated in support of laboratory experiments, reactor operator training, and neutron radiography. During this inspection, the reactor was started up and operated several hours per day at one hundred and thirty-two kilowatts (132 kW) to complete neutron radiographic operations. The maximum authorized power level is 250 kW. However, the licensee has opted to reduce the operating power of the reactor to achieve several goals including the reduction of personnel radiation exposures.

1. 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 Technical Specifications (TS), Change No. 8, dated October 22, 1974, were met:

- Aerotest Operations, Inc. organizational structure and staffing
- management and staff responsibilities
- staffing for safe operation of the Reactor Facility

b. Observations and Findings

Through discussions with licensee representatives the inspector determined that management responsibilities and the organization at the facility have not changed since the previous NRC inspection in August 2001 (Inspection Report Number [IR No.] 50-228/2001-201). The inspector determined that the Reactor Supervisor retained direct control and overall responsibility for management of the facility as specified in the TS. The Reactor Supervisor reported to the President, Aerotest Operations, Inc.

Through review of records and logs, as well as discussions with licensee personnel, the inspector determined that the current reduced staffing at the facility was acceptable to support the workload and ongoing activities. The staffing also met the requirements of the TS for effective reactor operations.

c. Conclusions

The licensee's organization and staffing met the requirements specified in the TS.

2. Review and Audit Functions

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the audits and reviews stipulated in the requirements of TS Section 12.1.3 were completed:

- Reactor Safeguards Committee (RSC) meeting minutes for the past two years

- Reactor Safeguards Committee Charter dated March 17, 1978
- Section I of the Procedures Manual entitled, "Administrative Procedures," last reviewed May 16, 2002
- TS defined duties of the RSC including the review and audit functions

b. Observations and Findings

The inspector determined that the Reactor Safeguards Committee membership satisfied the TS requirements and the Charter stipulations. The inspector reviewed the RSC's meeting minutes from September 2000 through present. The minutes showed that the RSC met annually as required and considered the types of topics outlined by the TS, including ALARA challenges faced by the facility.

The inspector noted that various committee personnel had completed audits of different aspects of the reactor facility operations and programs as stipulated in the TS. The audits and the resulting findings were appropriate and the licensee's response and corrective actions were acceptable. The inspector also noted that no audit had been completed during 2002 to date but determined that the licensee was in the process of arranging for the Chairman of the RSC or another assigned individual to conduct an audit as required.

The inspector toured the licensee's facility to note any changes that may have been made. The inspector toured the Control Room, High Bay, mezzanine, sample preparation area, and various support areas at the facility. The inspector noted no changes from the facility descriptions or annual report description of changes.

c. Conclusions

The RSC conducted audits according to the requirements specified in the TS.

3. Procedures

a. Inspection Scope (IP 69001)

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

- the process used to revise, review, and approve all facility procedures contained in Section I of the Procedures Manual entitled, "Administrative Procedures," last reviewed May 16, 2002
- Procedure Approval Sheets
- Procedure Change Notice (PCN) forms
- Section III of the Procedures Manual entitled, "General Emergency Procedures," last reviewed May 16, 2002
- Section VI of the Procedures Manual entitled, "Radiological Safety Procedures," last reviewed May 16, 2002

b. Observations and Findings

The inspector verified that procedures had been developed and were implemented for reactor operations and radiation safety. Procedures were being reviewed biennially and revised as needed. Procedure Approval Sheets were maintained and PCN forms were completed when changes were made as required. The inspector also noted that revisions were presented to the RSC for review and approval. The procedures were acceptable and in accordance with 10 CFR 20 and the TS. No problems were noted.

c. Conclusions

Facility procedures were acceptable and satisfied TS requirements for revision by the licensee, and were reviewed and approved by the RSC.

4. Radiation Protection Program

a. Inspection Scope (IP 69001)

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

- Section VI of the Procedures Manual entitled, "Radiological Safety Procedures," last reviewed May 16, 2002
- Section VIII of the Procedures Manual entitled, "Maintenance Procedures," last reviewed May 16, 2002
- radiation protection and reactor surveillance and survey data recorded on Aerotest Operations, Inc. Monthly Radiation Survey forms, Swipe Count Sheet forms, Air Filter Paper Counting Sheet forms, ARRR Pool Water Analysis forms, and Aerotest Operations, Inc. Quarterly Maintenance Check List forms from 2000 to the present
- calibration and periodic check of records for portable and fixed radiation monitoring instruments
- radiological signs and posting at the entrances and barriers for restricted areas
- dosimetry records for facility personnel for the past two years
- Training Log records documenting radiological safety training for facility personnel from 2000 to the present
- the Radiation Protection and ALARA Programs
- Special Work Permits - Numbers 2000-1 through 2002-1

The inspector also observed the use of dosimetry and radiation monitoring equipment during tours of the facility and conducted a radiation survey of the High Bay area with an NRC instrument.

b. Observations and Findings

Quarterly radiation and contamination survey results indicated that licensed activities were being conducted without the spread of contamination and in accordance with operating procedures. Equipment used for these activities was maintained, calibrated and used acceptably. The results of analyses of daily Continuous Air Sample filter

papers and monthly pool water samples indicated that no levels above those allowed in 10 CFR Part 20, Appendix B, Table 1 concentrations were present in the facility.

Copies of the current form, NRC Form 3, "Notice to Employees," were posted in accordance with 10 CFR 19.11. Caution signs, postings, and controls established for radiation areas and other restricted areas within the facility were as required in 10 CFR 20, Subpart J. Licensee personnel were observed to be adhering to the precautions established for access to the restricted areas.

The use of dosimeters was in accordance with radiation protection requirements. The licensee used a National Voluntary Laboratory Accreditation Program-accredited vendor to process dosimetry. Radiological exposure records showed that occupational doses and doses to the public were within 10 CFR Part 20 limitations.

Training records showed that personnel were acceptably trained in radiation protection practices. Annual refresher training was provided to all staff members by the facility Radiological Safety Officer. The most recent refresher training was completed January 14, 2002.

The licensee did not have or require a respiratory protection program or planned special exposure program. However, the inspector did note that the licensee had various air-supplied respirators and hoods staged in a locker for use in an emergency. The licensee understood that, since there is no respiratory protection program in place, even if the respirators or hoods were used in case of an emergency, the workers using the respirators/hoods would be assumed to have inhaled radioactive material at the airborne concentration in which the individuals were present. Therefore, no protection factor credit could be taken for the use of the respirators/hoods and personnel doses would need to be assigned based on the results of air samples taken in the area of airborne radioactivity.

The Radiation Protection Program was established and described in the 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 September 10, 2001, included all areas of the program and no weaknesses were reported. ALARA reviews were acceptably performed as required.

Special Work Permits (SWPs) were being prepared and used in accordance with the requirements specified in the licensee's "Radiological Safety Procedures." The controls and safety precautions specified were appropriate for the work conducted under the SWPs.

As noted above, during a tour of the facility the inspector conducted a radiation survey of the High Bay and mezzanine area and compared the readings noted with those found by the licensee. The results detected by the inspector were comparable to those found by the licensee. No discrepancies were noted.

c. Conclusions

Surveys and analyses were completed and documented acceptably to permit evaluation of the radiological conditions present in the facility. Radiation monitoring equipment was maintained and calibrated as required. Notices and postings at entrances to work areas met regulatory requirements. Personnel dosimetry was worn as required and doses were within the licensee's procedural action levels and the NRC's regulatory limits. Training was completed annually as required. The Radiation Protection and ALARA Programs satisfied regulatory requirements.

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:

- Section VI of the Procedures Manual entitled, "Radiological Safety Procedures," last reviewed May 16, 2002, outlining the licensee's environmental monitoring program
- environmental dosimetry records for the past two years
- Radioactive Liquid Waste Holding Tank release records
- gaseous monitoring and calculation records
- ARRR Operations Log Sheets

b. Observation and Findings

Gaseous releases were monitored as required by TS, calculated as prescribed by procedure, and acceptably documented. The results indicated that the releases were well within 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 dose calculated that could be received as a result of gaseous emissions from reactor operations was 1.4 E-3 millirem per year (mr/yr) for 2000 and 1.3 E-3 mr/yr for 2001. These doses were well below the limit set in 10 CFR 20.1101(d) of 10 mr/yr.

The licensee had released liquid from the Radioactive Liquid Waste Holding Tank only once during the past two years. The Radiological Safety Officer reviewed and approved the release after analyses proved that the release met regulatory requirements for discharge into the sanitary sewer.

c. Conclusion

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

6. 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:

- shipping records from 2000 through the time of the inspection
- operations records from 2000 through the present

The inspector also interviewed licensee personnel regarding shipments of radioactive material.

b. Observations and Findings

Staff interviews and record reviews showed that the licensee had not completed any radioactive material shipments since the last inspection of this area (refer to IR No. 50-228/2000-201). The inspector reviewed the licensee's program for transportation of radioactive material transport and determined that it was adequate.

c. Conclusions

The program for transportation of radioactive materials satisfied NRC requirements.

7. Physical Security

a. Inspection Scope (IP 81401, 81402, and 81421)

The inspector reviewed the following to verify compliance with the licensee's NRC-approved Physical Security Plan (PSP):

- Section V of the Procedures Manual entitled, "Security Procedures," last reviewed May 16, 2002
- Monthly Alarm Check List forms
- key and access controls currently in effect
- intruder detection and physical barriers
- records documenting the annual security refresher training

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 July 31, 1993, and had last been reviewed on May 16, 2002. The existing physical protection systems (barriers and alarms), equipment, and instrumentation were as stipulated in the PSP. Alarm system maintenance was completed as needed and alarm system tests were being conducted monthly as required. Access control was implemented as required by the PSP and licensee procedures. The PSP was being reviewed biennially and annual security training was

completed as stipulated by the PSP. The most recent security refresher training was completed on January 14, 2002.

After checking with the security alarm contractor and ensuring that some needed changes were made, the inspector verified that the response roster was current. Local Law Enforcement Agency assistance, if needed, would be obtained from Contra Costa County Sheriff's Department and the California State Highway Patrol. Support in the event of a fire would be provided by the Contra Costa County Fire Department.

c. Conclusion

The inspector determined that the licensee's physical protection program conformed to NRC requirements, the PSP, and the implementing procedures.

8. Material Control and Accounting

a. Inspection Scope (IP 85102)

To verify compliance with 10 CFR Parts 70 and 74 and with TS Sections 5.1 and 11 concerning the use and handling of special nuclear material (SNM), the inspector reviewed:

- ARRR SNM Control Manual dated January 22, 1980, and last reviewed May 15, 2001
- Section IV of the Procedures Manual entitled, "Critical Assembly and Power Calibration Procedures," last reviewed May 16, 2002
- control of Special Nuclear Material (SNM) storage areas
- annual SNM inventory results
- Nuclear Material Transaction Reports and Material Status Reports from April 2000 through March 2002

b. Observations and Findings

The records reviewed by the inspector showed that the licensee was maintaining control of SNM and SNM storage areas as required. The records also indicated that a physical inventory of all SNM at the facility was performed at least annually as required by 10 CFR 70.51(d). The inspector verified by record reviews and by observation that SNM was being used or stored in the locations specified by the TS and the SNM Control Manual. The inspector also determined that the licensee submitted Nuclear Material Transaction Reports (DOE/NRC Form 741) and Material Status Reports (DOE/NRC Form 742) to the appropriate agencies at the frequency and as required by 10 CFR 74.13(a)(1).

c. Conclusion

No deficiencies were identified in the licensee's Material Control and Accounting program.

9. Exit Interview

The inspection scope and results were summarized on August 29, 2002, with members of licensee management. The inspector described the areas inspected and discussed in detail 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

A. Meren, Manager, Neutron Radiography
R. Tsukimura, President, Aerotest Operations, Inc.
S. Warren, Radiological Safety Officer

Other Personnel

S. Burdt, Technical Services Manger, Denalect Alarm Company (Security Contractor)
T. Lindholm, Central Station Manger, Denalect Alarm Company

INSPECTION PROCEDURES USED

IP 69001	Class II Non-Power Reactors
IP 81401	Plans, Procedures, and Reviews
IP 81402	Reports of Safeguards Events
IP 81421	Fixed Site Physical Protection of Special Nuclear Material of Low Strategic Significance
IP 85102	Material Control and Accounting - Reactors
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As low as reasonably achievable
ARRR	Aerotest Radiography and Research Reactor
CFR	Code of Federal Regulations
IP	Inspection Procedure
kW	kilowatt
mr/yr	Millirem per year
NRC	Nuclear Regulatory Commission
PAR	Publicly Available Records
PCN	Procedure Change Notice
PDR	Public Document Room
PSP	Physical Security Plan
RSC	Reactor Safeguards Committee
SNM	Special Nuclear Material
SWP	Special Work Permit

TS

Technical Specification