

October 2, 2003

Mr. Randy Walti  
Vice President and General Counsel  
General Atomics  
P.O. Box 85608  
San Diego, CA 92186-9784

SUBJECT: NRC INSPECTION REPORT NOS. 50-163/2003-201 AND 50-089/2003-201

Dear Mr. Walti:

This letter refers to the inspection conducted on August 18-21, 2003, at your General Atomics TRIGA Reactors Facility. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, the NRC has identified a violation of NRC requirements. 10 CFR 55.21 states, in part, that a licensee shall have a medical examination by a physician every two years. Although all operators have had physicals through their personal physicians they had not, since active decommissioning stopped in 2000, had medical exams to meet 10 CFR 55.21 requirements. The circumstances surrounding this are described in detail in the subject inspection report. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, this violation would be categorized at Severity Level IV (Supplement I).

The corrective actions taken by your staff to have the operators get medical exams to meet 10 CFR 55.21 requirements and to insure they will continue to have them every two years was immediate and comprehensive. Based on these corrective actions made during the inspection, the NRC has determined that no further enforcement action is necessary to ensure compliance. No response to this letter is required.

Mr. R. Walti

-2-

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/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Stephen Holmes at 301-415-8583.

Sincerely,

*/RA/*

James E. Lyons, Program Director  
New, Research and Test Reactors Program (RNRP)  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket Nos.: 50-163, 50-89

License Nos.: R-67, R-38

Enclosure: NRC Inspection Report Nos. 50-163/2003-201 and 50-089/2003-201

cc w/encl.: Please see next page

General Atomics

Docket Nos .: 50-163, 50-89

cc:

Steve Hsu  
Radiologic Health Branch  
State Department of Health Service  
P.O. Box 942732  
Sacramento, CA 94234-7320

Dr. Keith E. Asmussen, Director  
Licensing, Safety, and Nuclear Compliance  
General Atomics  
P.O. Box 85608  
San Diego, CA 92186-9784

Ruben Develasco, Manager  
Decommissioning Project  
General Atomics  
P.O. Box 85608  
San Diego, CA 92186-9784

John S. Greenwood  
Manager, TRIGA Reactor Facility  
General Atomics  
P.O. Box 85608  
San Diego, CA 92186-9784

TRTR Newsletter  
Department of Nuclear Engineering Sciences  
University of Florida  
202 Nuclear Sciences Center  
Gainesville, FL 32611

Mr. R. Walti

-2-

October 2, 2003

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/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Stephen Holmes at 301-415-8583.

Sincerely,

**/RA/**

James E. Lyons, Program Director  
New, Research and Test Reactors Program (RNRP)  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket Nos.: 50-163, 50-89

License Nos.: R-67, R-38

Enclosure: NRC Inspection Report Nos. 50-163/2003-201 and 50-089/2003-201

cc w/encl.: Please see next page

**Distribution w/encl:**

PUBLIC RNRP\R&TR r/f AAdams CBassett PDoyle TDragoun  
WEresian FGillespie SHolmes DHughes EHylton PIsaac  
PMadden MMendonca JLyons BDavis (Ltr only O5-A4)  
NRR enforcement coordinator (Only for IRs with NOVs, O10-H14)

**ADAMS ACCESSION NO.: ML032681051**

**TEMPLATE NO.: NRR-106**

OFFICE	RNRP:RI		RNRP:LA		RNRP:SC		RNRP:PD	
NAME	SHolmes:rdr		EHylton		PMadden		JLyons	
DATE	09/ 30 /2003		09/ 30 /2003		10/ 01 /2003		10/ 01 /2003	

**C = COVER**

**E = COVER & ENCLOSURE  
OFFICIAL RECORD COPY**

**N = NO COPY**

U. S. NUCLEAR REGULATORY COMMISSION

Docket Nos.: 50-163 and 50-89

License Nos.: R-67 and R-38

Report Nos.: 50-163/2003-201 and 50-89/2003-201

Licensee: General Atomics

Facility: TRIGA Reactors Facility

Location: 3550 General Atomics Court, Building 21  
San Diego, CA

Dates: August 18-21, 2003

Inspector: Stephen W. Holmes

Approved by: James E. Lyons, Program Director  
New, Research and Test Reactors Program (RNRP)  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

This routine, announced inspection included on site review of various aspects of the licensee's programs concerning operations, emergency preparedness, physical security and safeguards, radiation protection, material control and accounting, and transportation activities as they relate to the licensee's Class III Research Reactor. The licensee's programs were directed toward the protection of public health and safety and were in compliance with NRC requirements.

### Organization and Staffing

- Organization and Staffing met Technical Specification Sections 7 and 8 and Decommissioning Plan Section 2.4 requirements.

### Review, Audit, and Design Change Functions

- The CRSC performed their review and oversight functions as required by Technical Specification Sections 7 and 8. No 10 CFR 50.59 Decommissioning Plan or TRIGA Reactor Facility design changes had been performed.

### Decommissioning and Maintenance Activities

- The decommissioning and maintenance activities were consistent with applicable Technical Specification and procedural requirements. The licensee was following the schedule outlined in the Decommissioning Plan, which indicates that completion of the project is dependent upon removal of all the fuel from the General Atomics site.

### Operator Licenses, Requalification, and Medical Activities

- The Requalification Program was being completed as required and records were being maintained. The operators were maintaining their licenses in an active status. One level IV violation was identified and closed.

### Fuel Handling and Movement

- Fuel handling activities and documentation were as required by Technical Specifications and facility procedures.

### Surveillance

- The program for Surveillance and Limiting Conditions for Operations confirmations was being implemented in accordance with Technical Specification Sections 3, 4, 5, 6 and licensee requirements.

### Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the Emergency Plan.



Radiation Protection Program

- The Radiation Protection Program being implemented by the licensee satisfied regulatory requirements.

Transportation

- Radioactive waste was disposed of as required by decommissioning plan Section 3.2.2, Department of Transportation 49 CFR Parts 172 and 173, Nevada Test Site, and licensee requirements.

Material Control and Accounting

- Special Nuclear Materials were being controlled and inventoried as required.

Physical Security and Safeguards

- The physical security features, equipment, and procedures of the General Atomics TRIGA Reactor Facility satisfied the Fixed Site and Transportation Plan requirements.

Effluents

- No gaseous or liquid effluents have been released since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). Dose to the public calculated using the COMPLY Code and was well below the dose constraint of 10 millirem per year specified in 10 CFR 20.1101 (d).

## REPORT DETAILS

### **Summary of Plant Status**

The reactor is held under a Possession Only License (POL) amendment with an approved Decommissioning Plan (DP). Reactor fuel remains in storage on site. The reactor building and adjacent shops, laboratories, and offices are unoccupied. Facilities are routinely entered for radiation surveys, calibrations, and surveillances on equipment. The NRC issued license amendments on August 12, 1999, authorizing the licensee to begin decommissioning the two remaining research reactors on site. During this inspection no decommissioning was underway. The licensee was maintaining the facility as required by the Technical Specifications and the DP.

#### **1. Organization**

##### **a. Inspection Scope (Inspection Procedure [IP] 40755)**

The inspector reviewed the following to ensure staffing, reporting, and record keeping requirements specified in Technical Specification (TS) Sections 7 and 8 and DP Section 2.4 were being met, the inspector reviewed:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- General Atomics (GA) TRIGA Reactor Facility (TRF) DP, dated July 1999
- administrative controls and management responsibilities specified in TS Sections 7 and 8
- administrative controls and management responsibilities specified in DP Section 2.4
- organization and staffing for the TRF
- Administrative Procedures, TRF, Revision 15, dated May 2003
- Standard Operating Procedure (SOP) No. 1, Procedural and Administrative Requirements - TRF, Revisions 20 and 36, dated January 2003
- GA Mark F and Mark I 2002 annual reports, dated March 3, 2003
- GA Internal Memorandum, from Max Kemp to Distribution, Subject: TRIGA Decommissioning Project Organization, dated August 21, 2003

##### **b. Observations and Findings**

The licensee's current operational organization structure and assignment of responsibilities were consistent with those specified in TS Sections 7 and 8 and DP Section 2.4. All positions were filled with qualified personnel. Through discussions with licensee representatives the inspector determined that, although individual personnel had changed, no functional changes had occurred in the organization since last inspected (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). Review of records verified that management responsibilities were administered as required.

The TRF Decommissioning Project Manager (DPM) also had responsibility for all decommissioning projects on the GA site. As such the DPM reports to the Facilities Director. The TS and the DP required and the inspector verified that the TRF DPM reported to the Vice President for Research and Development. The licensee reconfirmed this by memo dated August 21, 2003.

The annual reports summarized the required information and were issued at the frequency specified in TS Sections 7.6.d and 8.6.d.

c. Conclusions

Organization and Staffing met TS Sections 7 and 8 and DP Section 2.4 requirements.

**2. Review, Audit, and Design Change Functions**

a. Inspection Scope (IP 40755)

The inspector reviewed the following to ensure that the licensee had established and conducted reviews and audits as required in TS Sections 7 and 8 and to determine whether modifications to the facility, if any, were consistent with 10 CFR 50.59:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- Criticality and Radiation Safety Committee (CRSC) meeting minutes from September 2001 through the present
- CRSC Audit of the TRF, dated September 24, 2001
- CRSC Audit of the TRF, dated December 6, 2002

b. Observations and Findings

The inspector reviewed minutes of the last two CRSC meetings. The minutes showed that the committee met at least once per calendar year as required by TS Sections 7.2.b and 8.2.b and that a quorum was present at each meeting. The topics considered during the meetings were appropriate and as stipulated in TS Sections 7.2.d and 8.2.d. The CRSC conducted audits and reviews of the facility as required by TS Sections 7.2.c and 8.2.c. Results of the audits were discussed with the licensee and recommendations for improvements were made. The inspector reviewed the committee's audit, the licensee response and corrective actions taken for a previous violation, and confirmed they were fulfilling their duties as required by TS Sections 7 and 8.

No 10 CFR 50.59 DP or TRF design changes had been performed since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495).

c. Conclusions

The CRSC performed their review and oversight functions as required by TS Sections 7 and 8. No 10 CFR 50.59 DP or TRF design changes had been performed.

**3. Decommissioning and Maintenance Activities**

a. Inspection Scope (IPs 40755 and 69001)

The inspector reviewed the following to ensure that activities at the site were proceeding as outlined in the DP, TS, and the applicable procedures:

- DP, dated July 1999
- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- GA TRF Work Authorization 3252-A, dated June 3, 2003
- Administrative Procedures, TRF, Revision 15, dated May 2003
- SOP No. 1, Procedural and Administrative Requirements - TRF, Revisions 20 and 36, dated January 2003
- SOP No. 4, Checklists -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 5 Facility Operation -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 10, Facility Maintenance and Repair -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 12, Pool System - TRIGA Mark F Reactor Facility, Revision 30, dated January 2003
- GA TRIGA D&D Project Procedure - Decommissioning of Mark I Reactor, Issue B, dated March 6, 2003
- GA TRIGA D&D Project Procedure - Decommissioning of Mark F Reactor, Issue C, dated March 6, 2003
- staffing for operations as recorded on the reactor log sheets
- GA Mark F and Mark I 2002 annual reports, dated March 3, 2003
- Mark F Reactor Log No. 10625, from September 2001 to present
- decommissioning schedule
- ongoing activities and plans
- TRF Maintenance Checklists September 2001 through the present

b. Observations and Findings

Decommissioning personnel have been following the general schedule for completing the project. The schedule, with a few licensee-approved 50.59 modifications, is outlined in the DP. Completion of the decommissioning project involving the TRF is ultimately dependent upon the removal of all fuel from the site. This requires Department of Energy (DOE) approval and acceptance. The licensee is pursuing all options available in this matter. The licensee has reached a point in the decommissioning where the fuel must be removed in order to continue. Those portions of the reactor and the associated equipment that could be removed from the Mark F and Mark I Reactor without jeopardizing the

ultimate fuel removal have been removed. Decommissioning activities are presently on hold until DOE agrees to accept the fuel.

Under the POL no power operations are authorized. All operations were focused on maintaining the integrity and security of the facility, monitoring fuel storage, performing required health physics operations, and fulfilling TS maintenance and monitoring requirements. These operations were carried out following written procedures. Information on the operational status of the facility was recorded in log books and on checklists as required by TS Sections 7.5 and 8.5 and licensee procedures. Use of maintenance and repair logs satisfied procedural requirements.

c. Conclusions

The decommissioning and maintenance activities were consistent with applicable TS and procedural requirements. The licensee was following the schedule outlined in the DP, which indicates that completion of the project is dependent upon removal of all the fuel from the GA site.

**4. Operator Licenses, Requalification, and Medical Activities**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that operator requalification activities and training were conducted as required and that medical requirements were met:

- GA Reactor TRIGA Reactors Facility Operator Requalification Program (REQ), dated March 3, 1998
- active license status of all current operators
- logs and records of reactor maintenance, monitoring, and surveillances from January 2000 through the present
- annual evaluations and biennial exams from January 2000 through the present
- individual operator records for the current training cycle
- medical examination records

b. Observations and Findings

The facility has three qualified licensed senior reactor operators-limited fuel handlers. All of the operators' licenses were current.

Records reviewed verified that annual operational and biennial written examinations were being administered as required. Through exam reviews, the inspector confirmed that the test questions covered the subject matter specified in REQ Section III.a. The inspector noted that the licensee was tracking and documenting hours and practice fuel handling manipulations to ensure that the operators met REQ Section II.a requirements and those stipulated in 10 CFR 55.53(e) to maintain operating licenses in an active status. In order to comply

with the requirement for actively performing the functions of a senior operator for a minimum of four hours per calendar quarter, the licensee included time spent on monitoring, surveillance, and maintenance of the Mark F Pool Canal (used to store all fuel) as required by REQ Section I.a.

10 CFR 55.21 states, in part, that a licensee shall have a medical examination by a physician every two years. During active decommissioning operators participated in the GA respiratory protection program which required physicals annually. These physicals met 10 CFR 55.21 requirements. Since active decommissioning stopped in 2000 no respiratory physicals have been given. Although all operators have had physicals through their personal physicians, they had not had medical exams specifically to meet 10 CFR 55.21 requirements. This is a level IV violation (VIO 50-89/2003-201-01).

When informed of this violation the licensee immediately scheduled the operators for physicals for the next day. The inspector subsequently verified that all operators received the scheduled medical exams. The requirement for medical examinations every two years was added to the "Status of RO/SRO Requalification Program" checklist as well as to the Licensing Safely and Nuclear Compliance, Director's quality assurance checklist.

The inspector concluded that the licensees immediate corrective actions were comprehensive and acceptable to provide the NRC assurance that this oversight will not reoccur. This item is considered closed.

c. Conclusions

The Requalification Program was being completed as required and records were being maintained. The operators were maintaining their licenses in an active status. One level IV VIO was identified and closed.

**5. Fuel Handling and Movement**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that TS Sections 8, 10, 11, and licensee fuel handling and inspection requirements were being met:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- SOP No. 4, Checklists -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 5, Facility Operation -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 12, Pool System - TRIGA Mark F Reactor Facility, Revision 30, dated January 2003
- SOP No. 13, Fuel Movement - TRIGA Mark F Reactor Facility, Revision 36, dated January 2003
- fuel handling equipment and instrumentation

b. Observations and Findings

All fuel elements from the Mark I and Mark F Reactors have been moved to the Mark F fuel storage canal for storage as required by TS Sections 5.0 and 5.1.

Fuel movement has been limited to in-pool practice handling transfer manipulations of standard “dummy” elements. These activities provide practice in safe fuel handling to maintain staff proficiency for future fuel shipments. No real fuel elements have been moved since they were transferred to the canal.

The inspector verified by records review and direct visual inspection that fuel storage in the reactor tank was as required by TS Sections 5.0 and 5.1.

c. Conclusions

The fuel handling activities and documentation were as required by facility TS and procedures.

**6. Surveillance**

a. Inspection Scope (IP 40755)

The inspector reviewed the following to ensure that surveillances and Limiting Conditions for Operations (LCO) verifications were being completed as required by TS Sections 3, 4, 5, and 6:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- SOP No. 2, Auxiliary Instrumentation -TRIGA Mark F Reactor Facility, Revision 36, dated January 2003
- SOP No. 3, Radiation Monitors -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 4, Checklists -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 10, Facility Maintenance and Repair -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 11, Ventilation System -TRF, Revisions 20 and 36, dated January 2003
- SOP No. 12, Pool System - TRIGA Mark F Reactor Facility, Revision 30, dated January 2003
- Health Physics Procedure (HPP) No. 5 - Continuous Air Monitor Tests, dated February 2002
- HPP No. 19 - Containment ventilation Measurements, dated November 2000
- Nuclear Instrument Calibration Procedure (NCP) No. 2, Criticality Alarm Testing, Revision J, dated January 7, 2003
- NCP No. 105, Ludlum Model 32/44 Hand and shoe Monitor, Revision A, dated September 1, 1994
- NCP No. 219, Eberline RAMS II Radiation Monitoring System, Revision C, dated August 8, 1995

- NCP No. 3, Continuous Air Monitors, Revision B, dated February 2, 2002
- Mark F Reactor Log No. 10625, from September 2001 to present
- TRF Startup, Weekly, Quarterly, and Annual checklists from September 2001 to present (Figures 4.1, 4.2, 4.3 and 4.4 of Mark I and Mark F SOPs No. 4 Checklists)
- associated surveillance and calibration data and records from September 2001 to present

b. Observations and Findings

The surveillances for the reactor control, radiation monitoring, and engineered safety systems are to maintain the fuel in a safe, subcritical mode and to protect the safety of the reactor staff and the public.

The inspector reviewed selected weekly, quarterly, annual, other periodic checks, tests, verifications, and calibrations for TS-required surveillances and LCOs. They were being completed and documented as required by TS Sections 3, 4, 5, 6 and licensee requirements. A number were being performed more frequently than required. All the recorded results were within the TS and procedurally prescribed parameters and in close agreement with the previous surveillance results. The records and logs reviewed were accurate, complete, and were being maintained as required. All values checked by the inspector satisfied the limits/parameters listed in the procedure or checklist.

c. Conclusions

The program for surveillance and LCOs confirmation was being implemented in accordance with TS Sections 3, 4, 5, 6 and licensee requirements.

## 7. **Emergency Preparedness**

a. Inspection Scope (IP 40755)

The inspector reviewed selected aspects of the following to ensure the emergency plan (E-Plan) was being implemented as required:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- GA Radiological Contingency Plan, dated April 2001
- Emergency Procedures - TRF, Revision 16, dated March 6, 2003
- CRSC meeting minutes from September 2001 to present
- L. Gonzales, Manager, Health Physics Memorandum to File, 2001 Radiation Exercise, dated August 20, 2003
- emergency and evacuation drills from September 2001 to present
- emergency response facilities, supplies, equipment and instrumentation training records

b. Observations and Findings

The E-Plan in use at the reactor and emergency facilities was the same as the version most recently submitted to the NRC. The Manager of Health Physics audited and reviewed the E-Plan at least annually as required by E-Plan Section 10.4. Implementing procedures were reviewed by the TRF Physicist-in-Charge as required by E-Plan Section 10.4 and were revised as needed to effectively execute the E-Plan.

Through reviews of training and drill records and interviews with TRF and GA Security personnel, the inspector confirmed that emergency response training was given as required by E-Plan Section 10.2 and that emergency responders were knowledgeable of the proper actions to take in case of an emergency. The inspector also verified that off-site support organizations had been periodically briefed on site activities as required by E-Plan Section 10.2.

The notification procedures and phone numbers in use by the GA Security dispatch were current. The dispatchers were knowledgeable of their response to TRF emergencies.

Emergency facilities, instrumentation, equipment, and supplies were being maintained, controlled, and inventoried quarterly as required by E-Plan Section 10.5.

Criticality evacuations were conducted semiannually and selected aspects of the contingency plan were exercised biennially, not to exceed 27 months, as required by E-Plan Section 10.3.

The inspector reviewed documentation of the latest emergency drill. The 2001 annual drill required by the E-Plan was conducted on November 29, 2001. The drill was designed to evaluate GA's Emergency Response Organization's (ERO) response to a severe extremity injury at the Nuclear Waste Processing Facility with high contamination in the wound and in the immediate area. GA Security, Health Physics Staff, and Nuclear Waste Processing Facility personnel participated in the response. The drill scenario acceptably exercised the ERO's capabilities. Critiques were held following the drills to discuss the strengths and weaknesses identified during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented.

The inspector confirmed that Scripps Memorial Hospital and the San Diego Fire and Police departments had agreed to provide assistance to GA in an emergency as noted in E-Plan Section 4.1.6.

c. Conclusions

The emergency preparedness program was conducted in accordance with the E-Plan.

## 8. Radiation Protection Program

### a. Inspection Scope (IPs 40755 and 69001)

The inspector reviewed the following to ensure that the requirements of 10 CFR Part 20, TS, and the licensee's Radiation Protection Program (RPP) were being met:

- HPP No. 18, Issue and Retrieval of Personnel Monitoring Devices, dated November 2001
- HPP No. 64, Procedure for Performing a Routine Wipe (Smear) and Meter Survey
- HPP No. 123, Routine Duties for Health Physics Technician assigned to TRIGA facility (Bldg 21), dated April 1997
- HPP No. 184, Restricted Area Posting and Container Labeling, dated October 2002
- HPP No. 186, Instructions for Restricted Area Entry/Exit Surveys
- HPP No. 1004, Laboratory Procedure for Gamma Spectroscopy, dated March 2002
- HPP No. 1005, Laboratory Procedure for Alpha/Beta System Using GENIE ESP, dated August 2001
- HPP No. 1006 - Annual Review of the Radiation Protection Program, dated November 1997
- NCP No. 2, Criticality Alarm Testing, Revision J, dated January 7, 2003
- NCP No. 3, Continuous Air Monitors, Revision B, dated February 2, 2002
- NCP No. 105, Ludlum Model 32/44 Hand and shoe Monitor, Revision A, dated September 1, 1994
- NCP No. 219, Eberline RAMS II Radiation Monitoring System, Revision C, dated August 8, 1995
- CRSC meeting minutes from September 2001 through the present
- CRSC Annual Audit of the of Health Physics Activities, dated November 21, 2002
- CRSC Annual Audit of the of the Nuclear Calibration Laboratory, dated December 4, 2002
- CRSC completed audits and reviews from September 2001 through 2003
- GA Mark F and Mark I 2002 annual reports, dated March 3, 2003
- Personnel dosimetry records from September 2001 to present
- selected EH&S instrument calibration records

### b. Observations and Findings

#### (1) Radiation Protection Program

The RPP applied to the whole GA site to include the TRF.

Although individual procedures had been revised, the RPP had not appreciably changed since the last NRC inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). The RPP was reviewed at least annually

as required by 10 CFR 20.1101(c). This review and oversight was provided by the Health Physics Manager in accordance with HPP 1006.

The inspector's review of the annual RPP update, selected individual procedure changes, and HP records confirmed that the RSO and CRSC reviewed RPP changes and radiation protection related events/conditions. The inspector determined that they were performing their required oversight of the RPP as required by TS Sections 7.2.d and 8.2.d and licensee requirements.

(2) Postings and Notices

During tours, the inspector observed that caution signs, postings and controls in the controlled areas were acceptable for the hazards involving radiation and contaminated areas and were implemented as required by 10 CFR 20, Subpart J. 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 properly posted. No unmarked radioactive material was detected in the facility. The inspector confirmed that current copies of NRC Form-3 and notices to workers were posted in appropriate areas in the facility as required by 10 CFR Part 19.

(3) Surveys

The inspector audited selected monthly, quarterly, and other periodic contamination and radiation surveys and water analyses since September 2001. They were performed and documented as required by HPP. Results were evaluated and corrective actions taken and documented when readings/results exceeded the licensee's limits of 1,000 dpm /100cm<sup>2</sup>. The inspector's review of the survey records since September 2001, confirmed that contamination in the facility was infrequent. The inspector determined that the survey program satisfied 10 CFR 20.1501(a) requirements.

(4) Dosimetry

The dosimetry program requirements and procedures had not changed since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). A National Voluntary Laboratory Accreditation Program-accredited vendor was used to provide dosimetry for personnel, environmental, and area monitoring. The inspector confirmed that dosimetry was being issued to staff and visitors as required by 10 CFR 20.1502 and HPP 18. All exposures were well within NRC limits specified in 10 CFR 20.1201 and licensee action levels. Most records showed no exposure above background.

(5) Radiation Monitoring Equipment

The calibration and periodic checks of the portable survey meters, radiation monitoring instruments, and laboratory counters and analyzers were performed by the site calibration facility, the HP staff, or certified vendors. The inspector confirmed that the licensee's calibration procedures and frequencies satisfied TS Section 6.2, licensee procedures, 10 CFR 20.1501(b) requirements, and the American National Standards Institute N323 "Radiation Protection Instrumentation Test and Calibration" or the instrument's manufacturers' recommendations. The inspector verified that the calibration and check sources used were traceable to the National Institute of Standards and Technology and that the sources' geometries and energies matched those used in actual detection/analyses.

The inspector reviewed the TRF calibrations done since September 2001, and confirmed that the calibration for the portable survey meters and laboratory instruments had been done. All instruments checked had current calibrations appropriate for the types and energies of radiation they were used to detect and/or measure. Calibrations of the permanently installed radiation area monitors and the continuous air monitors were completed in accordance with requirements specified in TS Section 8.2.

c. Conclusions

The inspector determined that, because: 1) surveys were being completed and documented as required by 10 CFR Part 20.1501(a), TS, and licensee procedures; 2) postings met regulatory requirements; 3) the personnel dosimetry program was acceptably implemented and doses were in conformance with licensee and 10 CFR Part 20 limits; and 4) portable survey meters and radiation monitoring and laboratory instruments were being maintained and calibrated as required, the RPP being implemented by the licensee satisfied regulatory requirements.

**9. Inspection of Transportation Activities**

a. Inspection Scope (IP 86740)

The inspector reviewed selected aspects of the following to ensure that transportation requirements of 10 CFR, 49 CFR, and the Nevada Test Site were being met:

- GA Mark F and Mark I 2002 annual reports, dated March 3, 2003
- GA TRIGA Reactor Facility (TRF) DP, dated July 1999
- Audit of Low-Level Radioactive Waste Disposal Projects, No. 023077, dated October 31, 2002
- D&D Project Procedure FMP-1832, Radioactive Waste Shipments to the Nevada Test Site, Revision E, September 25, 2002

- D&D Project Procedure FMP-1828, Packaging of Solid Waste, Revision K, September 21, 2001
- D&D Project Procedure FMP-1829, Packaging Liquid Waste, Revision D, dated May 7, 1998
- HPP No. 16, Shipment or Individual Removal of Radioactive Materials, dated November 1998
- HPP No. 64, Procedure for Performing a Routine Wipe (smear) and Meter Survey, dated December 1999
- radioactive materials transportation and transfer records for 2002
- Radioactive Material Waste Transfer Package BGL02002, dated April 16, 2002
- Radioactive Material Waste Transfer Package BGL02005, dated May 1, 2002
- Radioactive Material Waste Transfer Package BGL02007, dated May 20, 2002
- Radioactive Material Waste Transfer Package BGL02019, dated June 26, 2002

b. Observations and Findings

49 CFR 171.8 defines a hazmat employer and employee while 49 CFR 172.704 delineates the training and record keeping required for such training provided by the employer.

The inspector verified that GA employees performing shipping activities had received the initial and refresher training required by 49 CFR 172.704.

49 CFR 173 requires that each shipper of a package maintain on file, a written document of the test and engineering evaluation or other data showing the package complies with the appropriate specification.

Packages used at the GA are purchased from a vendor who provides the manufacturers testing and evaluation documentation along with their packaging instruction. The documentation was on file by the licensee.

The facility had procedures in place for reporting to DOT transportation incidents/events involving licensed material shipped by them. During the inspection the inspector tested the emergency response phone number and was put in contact with the appropriate individual.

Ten (10) radioactive waste shipments were made during 2002 from the TRF. Radioactive waste was sent the DOE Nevada Test Site (NTS). The inspector reviewed the shipping files of four of these shipments. The shipments consisted of Low Specific Activity Y-4 boxes of contaminated rubble and soil, drums (55 gallon) of concrete made from contaminated water, drums of concrete made from demineralizer resin, and drums containing contaminated sewer pipes.

Through records review and interviews with staff, the inspector determined that :  
1) Y-4 boxes and drums were packaged as required by NTS and licensee

requirements; 2) radiation and contamination surveys performed prior to shipment were adequate in scope and indicated that levels were below limits specified in 49 CFR 173.441 and 173.443; 3) the shipment manifests and other documents were prepared accurately and included all required information, including the shipper's certification, as specified in 10 CFR Part 20 Appendix G and, 49 CFR Parts 172 and 173; 4) specific documentation required by the NTS was as required; and 5) marking and placarding was as required by 49 CFR Part 172, Subparts D, E, and F.

c. Conclusions

Based on the records reviewed and interviews performed, the inspector found the radioactive waste was disposed of as required by DP Section 3.2.2, Department of Transportation 49 CFR Parts 172 and 173, NTS, and licensee requirements.

**10. Material Control and Accounting**

a. Inspection Scope (IP 85102)

The inspector reviewed selected aspects of the following to ensure that 10 CFR Part 70 requirements were met:

- GA Fax from Chet to Junaid Razvi, "TRIGA Fuel Burnup Data", dated December 2, 1998
- GA Memo, from Junaid Razvi to C.L.Wisham, "Burnup Calculations: October 1, 1993 - March 31, 1994", dated April 13, 1994 (with attachments)
- nuclear material inventories (DOE/NRC Forms 741 and 742) from September 2001 to present
- accountability records and fuel storage locations
- SNM physical inventories since September 2001
- Mark F Reactor Log No. 10625, from September 2001 to present

b. Observations and Findings

The material control and accountability protocol established by the licensee tracked locations and content of fuel and fission detectors under the research reactor licenses. Since the reactors have been permanently shut down, no fuel burn-up calculations are required to be done.

A physical inventory of TRF SNM was conducted at least annually as required by 10 CFR 70.51(d). The inspector reviewed and verified that the material inventories had been performed as required.

The possession and use of SNM was limited to the locations and purposes authorized under the license. The material control and accountability forms (DOE/NRC Forms 741 and 742) were prepared and transmitted as required by 10 CFR 74.13(1).

c. Conclusions

SNM was being controlled and inventoried as required.

**11. Physical Safeguards and Protection**

a. Inspection Scope (IPs 81401 and 81421)

The inspector reviewed selected aspects of the following to ensure that the physical security plan was being implemented as required:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- Fixed Site and Transportation Plan (FSTP) for Protection of Special Nuclear Material at the GA TRF, dated February 2001
- Reply to NRC Notice of Violation, dated February 12, 2002
- CRSC meeting minutes from September 2001 through the present
- GA Security Alarm Books Nos. 117 and 118
- GA Security Watch Tour Records for August 2003
- GA Security Patrol Reports for August 2003
- Mark F Reactor Log No. 10625, from September 2001 to present
- security systems, equipment and instrumentations
- implementation of the SP

b. Observations and Findings

The FSTP was the same as the latest approved by the NRC.

The inspector reviewed the implementation of the licensee's FSTP. The inspector toured the facility and confirmed that the physical security systems (barriers and alarms), equipment, and instrumentation were as required by the FSTP. Keys to access doors were held and controlled only by designated personnel. Access and key control was implemented in accordance with licensee procedures and as required by the plan.

The facility was patrolled by GA security at intervals more frequent than required by the FSTP. If required, back-up support would be provided by the San Diego Police Department. The inspector verified that the security checks, tests, verifications, and the biennial audits were performed and tracked as required by the FSTP. Corrective actions were taken when required. The inspector confirmed that there had been no safeguards events since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495).

The inspector interviewed the GA Security Department Director, a dispatcher, and several security guards. The Director, dispatcher, and officers were knowledgeable of their response responsibilities.

c. Conclusions

Based on the observations, the inspector found that the physical security features, equipment, and procedures satisfied the FSTP requirements.

## 12. Effluents

### a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to ensure compliance with 10 CFR Part 20 and TS Sections 3.7, 4.7, and 6.6 requirements:

- TS for the TRIGA Mark I and Mark F Reactors, Amendment Nos. 36 and 45, dated August 12, 1999
- GA Mark F and Mark I 2002 annual reports, dated March 3, 2003
- COMPLY Code results for the TRF

### b. Observation and Findings

Since the reactor is shut down no gaseous or liquid effluents have been released since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). The dose to the public calculated using the COMPLY Code and was well below the dose constraint of 10 millirem per year specified in 10 CFR 20.1101 (d).

### c. Conclusion

No gaseous or liquid effluents have been released since the last inspection (refer to NRC Inspection Nos. 50-163/2001-201 and 50-89/2001-201, ADAMS Accession No. ML013020495). Dose to the public calculated using the COMPLY Code and was well below the dose constraint of 10 millirem per year specified in 10 CFR 20.1101 (d).

## 13. Follow-up on Previously Identified Issues

### a. Inspection Scope

The inspector followed up on one violation (VIO) and one inspector follow-up item (IFI) as identified and documented in Inspection Report Nos. 50-163/2000-201 and 50-163/2001-201 respectively. The inspector reviewed these issues with the licensee to determine what actions, if any, had been taken.

b. Observations and Findings

- 1) IFI - 50-163/2000-201-01 - Demonstrate an adequate method of adjusting the SNM inventory to reflect the change in burn-up calculation method.

In March of 2000, the licensee's records concerning burn-up adjustments to the fuel inventory were reviewed. Several years prior to the inspection the licensee had changed their method of calculating fuel burn-up to better reflect uranium consumption. This change in calculation method resulted in the need for an adjustment to the material inventory records. The records did not appear to clearly reflect what those adjustments were or how they were made. Consequently, the licensee's method of adjusting the SNM inventory to reflect the change in burn-up calculation method was made an IFI.

During this inspection, the inspector reviewed this issue with the licensee. The licensee indicated that the process was reviewed and a memorandum written explaining what had been done. The inspector reviewed the memorandum, interviewed the knowledgeable licensee staff and determined the adjustments were appropriate and clearly reflected how they were made. This item is considered closed.

- 2) VIO-50-163/2001-201-01 - Failure to mark documents sent to the NRC in a conspicuous manner to indicate the presence of protected information.

On March 5, 2001, the licensee submitted updated (February 2001) versions of their safeguards plans, incorporating the changes and the additional information provided in the licensee's response to an NRC request for additional information. However, these updated versions of the plans were not marked by the licensee as containing safeguards information

The licensee responded to the violation by letter dated February 12, 2002. The licensee stated that all documents had been conspicuously marked with the words "Safeguards Information." Documents existing at the time were either stamped "Safeguards Information," or they were destroyed and replaced with new documents which were printed with the words "Safeguards Information." All file copies and electronic templates for revisions had "Safeguards Information" conspicuously marked on them. Additionally, those few cognizant GA employees who have a responsibility involving documents containing "Safeguards" information have all been counseled regarding the need for, and importance of, properly marking all such documents. The inspector reviewed the licensee corrective actions and confirmed that they were in full compliance. This item is considered closed.

c. Conclusion

One VIO and one IFI as identified during previous inspections were reviewed and both were closed during this inspection.

**14. Exit Interview**

The inspection scope and results were summarized on August 21, 2003, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings.

## **PARTIAL LIST OF PERSONS CONTACTED**

### Licensee

*K. Asmussen,	Director, Licensing, Safety, and Nuclear Compliance
*R. Develasco,	Manager, Decommissioning Project
*L. Drees	Chair, CRSC-TRIGA Subcommittee
*L. Gonzales,	Manager, Health Physics
*J. Greenwood,	Physicist-in-Charge and Manager, TRIGA Reactors Facility
*H. Kleinsorge,	Security Administrator
M. Monreal	Supervisor, Nuclear Calibration Laboratory
*B. Stowe	Informations Systems Security Officer
*W. Whittemore	Senior Scientific Advisor, TRIGA Group

\* attended exit interview

## **INSPECTION PROCEDURE USED**

IP 40755	Class III Non-power Reactors
IP 69001	Class II Non-Power Reactors
IP 81401	Plans, Procedures, and Reviews
IP 81421	Fixed Site Physical Protection of Special Nuclear Material of Moderate Strategic Significance
IP 85102	Material Control and Accounting
IP 86740	Inspection of Transportation Activities

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

### Opened

VIO 50-89/2003-201-01	Licensed operators had not had medical exams every two years as required by 10 CFR 55.21.
-----------------------	---

### Closed

IFI - 50-163/2000-201-01	Demonstrate an adequate method of adjusting the SNM inventory to reflect the change in burn-up calculation method.
--------------------------	--

VIO-50-163/2001-201-01	Failure to mark documents sent to the NRC in a conspicuous manner to indicate the presence of protected information
------------------------	---

VIO 50-89/2003-201-01	Licensed operators had not had medical exams every two years as required by 10 CFR 55.21.
-----------------------	---

### Discussed

NONE



## LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CRSC	Criticality and Radiation Safety Committee
DEH	Department of Environmental Health
DP	Decommissioning Plan
DPM	Decommissioning Project Manager
EH&S	Environment Health and Safety
EP	Emergency Procedure
E-Plan	Emergency Plan
ERO	Emergency Response Organization
FSTP	Fixed Site and Transportation Plan
GA	General Atomics
HPP	Health Physics Procedure
IP	Inspection Procedure
IFI	Inspector follow-up Item
LCO	Limiting Condition for Operations
NCP	Nuclear Instrument Calibration Procedure
NRC	Nuclear Regulatory Commission
NTS	Department of Energy Nevada Test Site
POL	Possession Only license
REQ	Requalification Program
RPP	Radiation Protection Program
SNM	Special Nuclear Materials
SOP	Standard Operating Procedure
SP	Security Plan
SRO	Senior Reactor Operator
TRF	TRIGA Reactor Facility
TS	Technical Specifications
VIO	Violation