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**VIA OVERNIGHT DELIVERY SERVICE**

Document Control Desk  
ATTN: Mr. Alexander Adams, Jr., Senior Project Manager  
Non-Power Reactors & Decommissioning Projects Directorate  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

**Subject: Docket No. 50-89, Facility License R-38, and  
Docket No. 50-163, Facility License R-67;  
Submission of General Atomics' TRIGA<sup>®</sup> Mark I and Mark F Annual  
Reports for Calendar Year 2005 (3 Copies each)**

Dear Mr. Adams:

Enclosed are the annual reports required by the applicable Technical Specifications of General Atomics' (GA's) Mark I (License R-38) and Mark F (License R-67) TRIGA<sup>®</sup> research reactors. These reports cover operations for the calendar year 2005. The sections of these reports are numbered consistent with the items of information referred to in Section 7.6d of the Technical Specifications for the Mark I TRIGA<sup>®</sup> reactor and in 8.6d of the Technical Specifications for the Mark F TRIGA<sup>®</sup> reactor.

Should you desire additional information concerning the above, please contact me at (858) 455-2823, or Mr. John Greenwood at (858) 455-4526.

Very truly yours,

A handwritten signature in black ink that reads "Keith E. Asmussen".

Dr. Keith E. Asmussen, Director  
Licensing, Safety and Nuclear Compliance

Enclosures: "TRIGA<sup>®</sup> Mark I Reactor / Annual Report / Calendar Year 2005," dated March 2006 (3 Copies), and  
"TRIGA<sup>®</sup> Mark F Reactor / Annual Report / Calendar Year 2005," dated March 2006 (3 Copies)

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**TRIGA<sup>®</sup> Mark I Reactor**

**ANNUAL REPORT**

**CALENDAR YEAR 2005**

prepared to satisfy the requirements of  
U.S. Nuclear Regulatory Commission  
Facility License R-38  
Docket No. 50-89

**MARCH 2006**

TRIGA REACTORS FACILITY  
TRIGA Mark I Reactor  
ANNUAL REPORT  
Calendar Year 2005

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## Introduction

This report documents operation of the General Atomics (GA) TRIGA<sup>®</sup> Mark I Non-Power Reactor for the period January 1, 2005 through December 31, 2005. The TRIGA Mark I Reactor, possessed by GA at its San Diego, California facilities, was not operated for the duration of the reporting period. The Reactor is possessed by GA under License No. R-38 (Amendment No. 36) granted by the U.S. Nuclear Regulatory Commission (Docket No. 50-89).

This report is being prepared and submitted to satisfy the requirements of Section 7.6(d) of the R-38 Technical Specifications, as amended. This report is presented in six parts, consistent with the information required by the applicable Technical Specifications.

<sup>®</sup> TRIGA is a registered trademark of General Atomics

## 1. Summary of Facility Activities

### 1.1 Decommissioning Activities

During Calendar Year (CY) 2005, the TRIGA Mark I has been in Decommissioning status. There were no decommissioning activities performed during this period.

### 1.2 Facility Status

- o All TRIGA Mark I fuel remains situated in the Fuel Storage Canal portion of the Mark F Reactor pool, in Rm. 21/107.
- o Decommissioning of the contaminated soil around the pit of the Mark I reactor has been deferred until shipment of the fuel from the Mark F reactor pit for safety reasons.
- o The Senior Reactor Operators (SROs) have all completed the requirements necessary to keep their licenses current. The required biennial physical exam was taken by the three (3) operators during August 2005.
- o One SRO's license was renewed for a six (6) year period.
- o On June 9, 2005, two representatives of the USNRC inspected the TRF as part of the GA site visit to confirm various HP release surveys and to review all recent GA Radioactive Shipping documentation.
- o The Criticality and Radiation Safeguards Committee (CRSC) completed its annual inspection on December 14, 2005. No problems were noted.
- o The roof of Building 21 was surveyed by the General Atomics Health Physics organization. Very low levels of Cs-137 were detected; above background, but below site-wide release criteria.

### 1.3 Decommissioning Schedule

All major task items in the Decommissioning Plan schedule have been completed except for shipment of the fuel from the Mark F storage canal and the decommissioning of the soil around the pit.

#### 1.4 Radioactive Material Shipments

There were no shipments of radioactive material during the CY 2005 reporting period.

#### 2. Maintenance Operations

All TRIGA Mark I maintenance activities, performed during the reporting period, generally fall into three categories: (i) routine preventive maintenance, (ii) routine calibration activities, and (iii) activities associated with replacement of older components and systems due to age. All maintenance activities are recorded in the TRIGA Reactors Decommissioning Logbook. Facility Maintenance Checklists are completed on a regular schedule, at weekly, quarterly, and annual frequencies. All maintenance operations performed on the TRIGA Mark I were minor in nature. There were no major maintenance operations performed during the reporting period.

#### 3. 10CFR50.59 Facility Modifications and Special Experiments

There were no applications for Facility Modifications to the TRIGA Mark I, under the provisions of 10CFR50.59, submitted during the CY2005 reporting period. There were no new Special Experiments submitted for approval for the R-38 facility during CY2005.

#### 4. Radioactive Effluents Released to the Environs

During CY2005, 0.00 millicuries of Argon-41 were discharged from the TRIGA Mark I Reactor facility stack to the atmosphere.

#### 5. Environmental Surveys

During CY2005, the Environmental Monitoring Program (EMP) for the TRIGA Reactors Facility remained essentially unchanged from the prior year. The applicable EMP includes the following monitoring equipment and actions:

- o Five (5) emergency air samplers, situated on the Facility roof and around the TRIGA Reactor Facility perimeter.
- o Ten (10) environmental air samplers, situated adjacent to, and near the GA site perimeter, in accordance with the GA Material License (SNM-696).
- o Daily liquid effluent monitoring from the GA Main Sewerage Outfall Pump House, for gross alpha and beta radioactivity concentrations.

- o Annual soil and water sampling at ten (10) stations on the GA site, including stations around the perimeter of the TRIGA Reactor Facility.
- o External radiation monitoring of the TRIGA Reactor Facility using five (5) passive area dosimeters, as well as radiation meter surveys conducted periodically.
- o Since there were no decommissioning activities or fuel stored in the Mark I Facility the use of the Continuous Air Monitor (CAM) was discontinued. It will be placed in use any time in the future when there are decommissioning activities.

## 6. Summary of Radiation Exposures and Radiological Surveys

The following data summarizes measured personnel occupational radiation exposures and radiological surveys of the TRIGA Reactor Facility during CY2005. Personnel who are listed on the TRIGA Reactor Facility Work Authorization (WA #3294) and specific Radiation Work Permits (RWPs) were monitored for radiation exposure; these individuals included 19 General Atomics Staff and 17 Non-General Atomics Staff employees.

### 6.1 General Atomics Staff Whole Body Exposures<sup>1</sup>

Number of individuals monitored:	19
High Exposure:	0.011 Rem
Low Exposure:	0.000 Rem
Average Exposure:	< 0.001 Rem

### 6.2 Non-General Atomics Staff Whole Body Exposures<sup>2</sup>

Number of individuals monitored:	17
High Exposure:	0.000 Rem
Low Exposure:	0.000 Rem
Average Exposure:	0.000 Rem

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<sup>1</sup> Includes reactor facility staff and facility support staff authorized to work at the TRIGA Reactor Facility. These personnel may also work routinely at other GA radiation facilities; therefore, this dose represents *cumulative* exposure at all GA facilities.

<sup>2</sup> Includes non-GA sub-contractor personnel who were granted periodic access to the TRIGA Reactor Facility for the performance of work. These personnel may also work routinely at other GA radiation facilities; therefore, this dose represents *cumulative* exposure at all GA facilities

### 6.3 Routine Wipe Surveys of Mark I Reactor Facility

High Wipe:	2.90 dpm/100 cm <sup>2</sup>
Low Wipe:	< 1.00 dpm/100 cm <sup>2</sup>
Average Wipe:	< 1.00 dpm/100 cm <sup>2</sup>

### 6.4 Routine Radiation Measurements of Mark I Reactor Facility

High Measurement:	1.5 mRem/hr @ 1 foot
Low Measurement:	< 0.2 mRem/hr @ 1 foot
Average Level:	< 0.2 mRem/hr @ 1 foot

**TRIGA<sup>®</sup> Mark F Reactor**

**ANNUAL REPORT**

**CALENDAR YEAR 2005**

prepared to satisfy the requirements of  
U.S. Nuclear Regulatory Commission  
Facility License R-67  
Docket No. 50-163

**MARCH 2006**

**TRIGA REACTORS FACILITY  
TRIGA Mark F Reactor  
ANNUAL REPORT  
Calendar Year 2005**

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## Introduction

This report documents operation of the General Atomics (GA) TRIGA<sup>®</sup> Mark F Nonpower Reactor for the period January 1, 2005 through December 31, 2005. The TRIGA Mark F Reactor, possessed by GA at its San Diego, California facilities, was not operated for the duration of the reporting period. The Reactor is possessed by GA under License No. R-67 (Amendment No. 45) granted by the U.S. Nuclear Regulatory Commission (Docket No. 50-163).

This report is being prepared and submitted to satisfy the requirements of Section 8.6(d) of the R-67 Technical Specifications, as amended. This report is presented in six parts, consistent with the information required by the applicable Technical Specifications.

<sup>®</sup> TRIGA is a registered trademark of General Atomics

## 1. Summary of Facility Activities

### 1.1 Decommissioning Activities

During Calendar Year (CY) 2005, the TRIGA Mark F has been in Decommissioning status. The following represents a summary of activities during this reporting period:

### 1.2 Facility Status

- o The Senior Reactor Operators (SROs) have all completed the requirements necessary to keep their licenses current. The required biennial physical exam was taken by the three (3) operators during August 2005.
- o One SRO's license was renewed for a six (6) year period.
- o All TRIGA Mark F fuel remains in the Fuel Storage Canal.
- o All stainless steel non-fuel items stored in the Mark F pool were characterized and a final report prepared.
- o New security system hardware (for Fire, Criticality and Intrusion) was purchased and delivered just prior to the end of the calendar year. It will be installed during the next reporting period.
- o On February 18, 2005, representatives of the San Diego Police Department and Department of Homeland Security met on site to discuss current plans for stepped up security at the Mark F Facility. Their primary goal is to create a protective security buffer zone around the GA site in the event of a security breach.
- o On June 9, 2005, two representatives of the USNRC inspected the TRIGA Reactor Facility as part of the GA site visit to confirm various HP release surveys and to review all recent GA Radioactive Shipping documentation.
- o The Criticality and Radiation Safeguards Committee (CRSC) completed its annual inspection on December 14, 2005. No problems were noted.
- o The roof of Building 21 was surveyed by the General Atomics Health Physics organization. Very low levels of Cs-137 were detected; above background, but below site-wide release criteria.

### 1.3 Decommissioning Schedule

All decommissioning for the Mark F reactor has been completed up to the point where the fuel needs to be shipped. Any further decommissioning tasks may jeopardize the fuel and will only be conducted after the fuel is shipped.

### 1.4 Radioactive Material Shipments

Two (2) Model RG-1 Sr-90 Radioisotope Thermoelectric Generators stored in the Mark F Facility were shipped to the Los Alamos National Laboratory Off-Site Source Recovery Program on May 9, 2005. This removed 7,340 Curies (272 Tbq) of activity from the site.

One (1) Am-Be (2.52 Ci  $^{241}\text{Am}$ ) start-up source was packaged and shipped to CNESTEN in Morocco on December 9, 2005.

Two (2) Fission Chambers (1.68gm  $^{235}\text{U}$  [93.1% enriched]) were packaged and shipped to CNESTEN in Morocco on December 22, 2005.

## 2. Maintenance Operations

All maintenance activities, performed during the reporting period, generally fall into three categories: (i) routine preventive maintenance, (ii) routine calibration activities, and (iii) activities associated with replacement of older components and systems due to age. All maintenance activities are recorded in the TRIGA Reactors Decommissioning Logbook. Facility Maintenance Checklists are completed on a regular schedule, at weekly, quarterly, and annual frequencies. All maintenance operations performed on the TRIGA Mark F were minor in nature. There were no major maintenance operations performed during the reporting period.

## 3. 10CFR50.59 Facility Modifications and Special Experiments

There were no applications for Facility Modification under the provisions of 10CFR50.59 submitted for the R-67 facility during the CY2005 reporting period. There were no Special Experiments submitted for the R-67 facility during CY2005.

## 4. Radioactive Effluents Released to the Environs

During CY2005, 0.00 millicuries of Argon-41 were discharged from the TRIGA Mark F Reactor facility stack to the atmosphere.

## 5. Environmental Surveys

During CY2005, the Environmental Monitoring Program (EMP) for the TRIGA Reactors Facility remained essentially unchanged from the prior year. The applicable EMP includes the following monitoring equipment and actions:

- o Five (5) emergency air samplers, situated on the Facility roof and around the TRIGA Reactor Facility perimeter.
- o Ten (10) environmental air samplers, situated adjacent to, and near the GA site perimeter, in accordance with the GA Special Nuclear Material License (SNM-696).
- o Daily liquid effluent monitoring from the GA Main Sewerage Outfall Pump House, for gross alpha and beta radioactivity concentrations.
- o Annual soil and water sampling at ten (10) stations on the GA site, including stations around the perimeter of the TRIGA Reactors Facility.
- o External radiation monitoring of the TRIGA Reactor Facility using five (5) passive area dosimeters, as well as radiation meter surveys conducted periodically.
- o A Continuous Air Monitor (CAM), situated in the Mark F Reactor Room (21/107), to continuously sample room air for airborne radioactivity. CAM air filters are collected each week and analyzed for radioactivity.

## 6. Summary of Radiation Exposures and Radiological Surveys

The following data summarizes measured personnel occupational radiation exposures and radiological surveys of the TRIGA Reactors Facility during CY 2005. Personnel who are listed on the TRIGA Reactors Facility Work Authorization (WA #3294) and specific Radiological Work Permits (RWPs) were monitored for radiation exposure; these individuals included 19 General Atomics Staff and 17 Non-General Atomics Staff employees.

6.1 General Atomics Staff Whole Body Exposures<sup>1</sup>

Number of individuals monitored: 19  
High Exposure: 0.011 Rem  
Low Exposure: 0.000 Rem  
Average Exposure: < 0.001 Rem

6.2 Non-General Atomics Staff Whole Body Exposures<sup>2</sup>

Number of individuals monitored: 17  
High Exposure: 0.000 Rem  
Low Exposure: 0.000 Rem  
Average Exposure: 0.000 Rem

6.3 Routine Wipe Surveys of Mark F Reactor Facility

High Wipe: 5.90 dpm/100 cm<sup>2</sup>  
Low Wipe: < 1.00 dpm/100 cm<sup>2</sup>  
Average Wipe: < 1.00 dpm/100 cm<sup>2</sup>

6.4 Routine Radiation Measurements of Mark F Reactor Facility

High Measurement: 42.0 mRem/hr @ 1 foot  
Low Measurement: <0.2 mRem/hr @ 1 foot  
Average Level: 1.9 mRem/hr @ 1 foot

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<sup>1</sup> Includes reactor facility staff and facility support staff authorized to work at the TRIGA Reactor Facility. These personnel may also work routinely at other GA radiation facilities; therefore, this dose represents *cumulative* exposure at all GA facilities

<sup>2</sup> Includes non-GA personnel who were granted periodic access to the facility for the performance of work. These personnel may also work routinely at other GA radiation facilities; therefore, this dose represents *cumulative* exposure at all GA facilities.