



**TRIGA<sup>®</sup> Mark F Reactor**

**ANNUAL REPORT**

**CALENDAR YEAR 2010**

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

**MARCH 2011**

**GENERAL ATOMICS TRIGA REACTORS FACILITY  
TRIGA Mark F Reactor  
ANNUAL REPORT  
Calendar Year 2010**

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## Introduction

This report documents operation of the General Atomics (GA) TRIGA<sup>®</sup> Mark F Non-power Reactor for the period January 1, 2010 through December 31, 2010. 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 TRIGA Mark F 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) 2010, the TRIGA Mark F Reactor was in a Decommissioning status. The major task accomplished during this reporting period was the removal of all irradiated fuel elements from the Mark F Reactor Pool.

### 1.2 Facility Status

1.2.1 All TRIGA Mark F and Mark I Reactor fuel has been removed from the Storage Canal portion of the TRIGA Mark F Reactor Pool and shipped off-site.

1.2.2 The GA Senior Reactor Operators (SROs) have all completed the requirements necessary to maintain their licenses current.

1.2.2.1 The SROs completed the required biennial SRO requalification written examination on July 8, 2010. All three SROs passed the examination.

1.2.2.2 On September 23, 2010, the SROs were evaluated as Satisfactory in all areas as part of GA's USNRC-approved Operator Requalification Program.

1.2.2.3 All fuel was shipped offsite by the middle of September of 2010. As a result of the lack of fuel on site, one SRO's license was allowed to expire in October 2010.

1.2.3 From February 10, 2010 through August 30, 2010, a series of four inspections were conducted by USNRC inspectors, Vincent Everett, Lee Brookhart, Earl Love, Robert Temps, and James Pearson. Not all inspectors were here for all of the visits. The visits were to observe activities related to the removal of all TRIGA spent fuel from the TRIGA Facility Reactor Site to assure compliance with all licensing, regulatory, and GA procedural requirements

1.2.3.1 GA Fuel Examination Inspection February 10 - 11, 2010.

Based on the results of this inspection, no findings of significance were identified.

1.2.3.2 GA Failed Fuel Can Inspection and Loading July 12-16, 2010.

During this inspection, two USNRC violations were identified. Based on GA's corrective actions and

additional information, the NRC treated those violations as Non-Cited Violations (NCV) consistent with Section 2.3.2 of the USNRC enforcement policy.

1.2.3.3 GA Program Inspection July 26-30, 2010.

Based on the results of this inspection, one USNRC violation was identified. Based on GA's corrective action and additional information the USNRC treated this violation as a Non-Cited Violation (NCV) consistent with Section 2.3.2 of the USNRC enforcement policy.

1.2.3.4 NAC-LWT Cask Loading Inspection August 26 - 31, 2010.

Based on the results of this inspection, no findings of significance were identified.

1.2.4 From March 16 through March 18, 2010, Craig Bassett of the USNRC conducted a non-routine Security Inspection of the TRIGA Reactor Facility. No safety concerns or violations of regulatory requirements were discovered.

1.2.5 From April 27 - 28, 2010, Craig Bassett of the USNRC conducted another non-routine Security Inspection of the TRIGA Reactor Facility. Based on the results of this Inspection, no findings of significance were identified.

1.2.6 From August 27 - 30, 2010, Otis Smith, Jr. conducted a USNRC Security Inspection.

Because this inspection involved security-related information, no details of this inspection will be provided in this report.

1.2.7 On December 29, 2010, the Criticality and Radiation Safety Working Group (C&RSWG) completed its annual inspection of the TRIGA Reactor Facility. No problems were noted. A report is currently being prepared.

### **1.3 Decommissioning Schedule**

All major task items in the Decommissioning Plan through fuel removal for the TRIGA Mark F Reactor have been completed to the extent feasible. Now that all of the fuel has been removed, the remainder of the tasks will begin as early as is feasibly possible.

### **1.4 Radioactive Material Shipments**

Three (3) radioactive material shipments occurred from the TRIGA Reactor Facility during this reporting period.

- On September 1, 2010, 6,604 grams of Material Type 20, 110 grams of Material Type 50 along with the isotopes Cs-137, Ba-137m, Y-90, Sr-90 and Pu 241 was shipped offsite . Total activity shipped was 476.5 Tbq.
- On September 8, 2010, 6,393 grams of Material Type 20, 55 grams of Material Type 50, along with the isotopes Cs-137, Ba-137m, Y-90, and Sr-90 was shipped offsite. Total activity shipped was 619.1 Tbq.
- On September 15, 2010, 5,467 grams of Material Type 20, 49 grams of Material Type 50, along with the isotopes Cs-137, Ba-137m, Y-90, and Sr-90 was shipped offsite. Total activity shipped was 483 TBq.

## **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 Reactor Facility 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 Reactor Facility 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 CY2010 reporting period.

There were no Special Experiments submitted for the R-67 facility during CY2010.

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

During CY2010, 0.00 millicuries of Argon-41 were discharged from the TRIGA Mark F Reactor Facility ventilation stack to the atmosphere.

5      **Environmental Surveys**

During CY2010, 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      Six (6) 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      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), continuously samples 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 2010. Personnel who are listed on the TRIGA Reactors Facility Work Authorization (WA #3389) and specific Radiological Work Permits (RWPs) were monitored for radiation exposure; these individuals included 33 General Atomics Staff and 34 Non-General Atomics Staff employees. The following exposures were primarily as a result of fuel inspection, loading and shipment activities.

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

Number of individuals monitored:	33
High Exposure:	0.296 REM
Low Exposure:	0.000 REM
Average Exposure:	0.026 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.

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

Number of individuals monitored:	34
High Exposure:	0.071 REM
Low Exposure:	0.000 REM
Average Exposure:	0.009 REM

**6.3 Routine Wipe Surveys of Mark F Reactor Facility**

High Wipe:	999.0	dpm/100 cm <sup>2</sup>
Low Wipe:	< 1.0	dpm/100 cm <sup>2</sup>
Average Wipe:	7.7	dpm/100 cm <sup>2</sup>

**6.4 Routine Radiation Measurements of Mark F Reactor Facility**

High Measurement:	38	mR/hr
Low Measurement:	< 0.2	mR/hr
Average Level:	1.3	mR/hr

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<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.