UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

December 2, 2013

Ms. Charlotte Engstrom, Vice President
and General Counsel
General Atomics
P.O. Box 85608
San Diego, CA 92186-9784

SUBJECT: NRC INSPECTION REPORT 050-00089/13-001, 050-00163/13-001, AND 070-00734/13-001

Dear Ms. Engstrom:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on October 30, 2013, at the General Atomics facility located in San Diego, California. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The NRC's inspection results were presented to your staff at the conclusion of the onsite inspection. The enclosed report presents the results of this inspection. In summary, the inspectors determined that you were conducting site activities in accordance with license and regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC's Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans, Senior Health Physicist, at 817-200-1234 or the undersigned at 817-200-1191.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Docket: 050-00089, 050-00163, 070-00734
License: R-38, R-67, SNM-696

Enclosure:
NRC Inspection Report 050-00089/13-001,
050-00163/13-001, and 070-00734/13-001

cc w/encl: Dr. Keith Asmussen, Director,
General Atomics
Dr. Robert B. Weisenmiller, Chair,
California Energy Commission
Gonzalo Perez, Chief, California
Department of Public Health (CDPH)

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11/27/2013	11/27/2013	12/02/2013		

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	050-00089, 050-00163, 070-00734
License:	R-38, R-67, SNM-696
Report:	050-00089/13-001, 050-00163/13-001, and 070-00734/13-001
Licensee:	General Atomics
Facility:	Torrey Pines Main Site
Location:	3550 General Atomics Court San Diego, California 92121
Date:	October 30, 2013
Inspectors:	Robert Evans, Ph.D., P.E., C.H.P., Senior Health Physicist Repository and Spent Fuel Safety Branch
	Gregory G. Warnick, Senior Resident Inspector Repository and Spent Fuel Safety Branch
Accompanied By:	D. Blair Spitzberg, Ph.D., Chief Repository and Spent Fuel Safety Branch
Approved By:	D. Blair Spitzberg, Ph.D., Chief Repository and Spent Fuel Safety Branch Division of Nuclear Materials Safety
Attachment:	Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

General Atomics
NRC Inspection Report 050-00089/13-001, 050-00163/13-001, 070-00734/13-001

This inspection was a routine, announced inspection of licensed activities being conducted at the General Atomics facility in San Diego, California. In summary, the licensee was conducting activities in accordance with license and regulatory requirements.

Management Organization and Controls

- The licensee maintained site staffing in accordance with license requirements, and sufficient staff was available for the work in progress. The licensee continued to maintain written procedures for emergency and abnormal conditions in accordance with license requirements. Further, the licensee continued to conduct and document the maintenance and surveillance activities as required by the license. (Section 1.2.a)

Work Controls

- The inspectors confirmed that the licensee continued to conduct site decommissioning in accordance with the decommissioning plan dated July 1999. The licensee may have to update the decommissioning plan, as necessary, to address the remediation of mixed wastes. (Section 1.2.b)

Radiation Protection

- The licensee implemented its radiation protection program in accordance with license and regulatory requirements. The licensee monitored workers for occupational exposures, and no individual exceeded the regulatory limits during the period examined. (Section 1.2.c)

Instrument Calibrations

- The licensee's instrumentation program was found to be in compliance with site procedures. In response to a previous U.S. Nuclear Regulatory Commission (NRC) inspection finding at the Sequoyah Fuels Corporation site in Gore, Oklahoma, the licensee conducted an internal investigation to understand why it had supplied Sequoyah Fuels with calibrated meters with inconsistent documentation. Once notified about the documentation inconsistencies, the licensee implemented corrective actions that should prevent future problems with calibration documentation. (Section 1.2.d)

Effluent Control and Environmental Protection

- The licensee implemented its effluent control and environmental monitoring programs in accordance with license and regulatory requirements. All required samples were collected, and no sample result exceeded any license or regulatory limit. (Section 1.2.e)

Solid Radioactive Waste Management and Transportation

- The licensee conducted transportation activities in accordance with Department of Transportation regulations. (Section 1.2.f)

Report Details

Summary of Plant Status

The licensee constructed the Mark I reactor in 1957 and began operating the reactor in 1958. This reactor was originally licensed to operate at a power level of 10-kilowatts but was later upgraded to operate at a steady-state power of 250 kilowatts. The Mark I reactor was permanently shut down in 1997. The NRC amended the Mark I reactor License R-38 in October 1997 to a possession-only license.

In addition, the licensee constructed and began operating the Mark F reactor in 1960. This reactor was rated at 1500 kilowatts of steady state thermal power. This reactor was permanently shut down in 1995. In March 1995, the NRC revised the Mark F reactor License R-67 to a possession-only license.

During 2000-2001, the licensee submitted applications to the NRC to terminate the physical security plan for the Mark I reactor. Based on the status of decommissioning and actual site conditions, the NRC approved the licensee's request by license amendment dated July 20, 2001. At the same time, the NRC approved a new physical security plan for the Mark F reactor by license amendment dated July 20, 2001. At that time, the licensee still possessed reactor fuel at this facility. The remaining fuel was removed from the site in September 2010. The TRIGA fuel was shipped to an out-of-state facility operated by the U.S. Department of Energy. The licensee continues to maintain the physical security plan. At the time of this inspection, the licensee has not submitted a request to the NRC to downgrade its physical security plan for the Mark F reactor facility.

The licensee continues to decommission the two former TRIGA reactors. Since the previous inspection, conducted in October 2012, the licensee removed activated and contaminated metal from the Mark F reactor pool, and shipped this material for disposal at the Nevada National Security Site. The licensee collected core samples from the Mark F pit walls and floor during May 2013. The licensee later cleaned and painted portions of the pool pit. More wall and floor samples will be collected in the near future to further characterize the depth and volume of contamination. In the future, the licensee plans to core-drill through the walls of the Mark F reactor pit to determine the volume of wall and soil material to be remediated. In addition, the Mark I pit walls continue to contain europium contamination. This contamination will be removed at a later date by the licensee in conjunction with remediation of the Mark F reactor pit.

In September 1996, the NRC amended the special nuclear materials (SNM) License SNM-696 to authorize decommissioning activities only. By letter dated March 27, 1997, the NRC notified the licensee that it did not have to renew the SNM license since all licensed activities were associated with decommissioning, and ultimately, site release. In 2003, the licensed possession limit was lowered to less than critical mass quantities. License SNM-696 is currently a possession-only license. As validated by the inspector based on material transaction reports, all special nuclear material has been transferred from the NRC license (SNM-696) to the applicable State of California license (CAL 0145-37). At the time of this inspection, the licensee has not requested termination of the SNM license, but was considering its options for future work that may be conducted under this license.

The licensee continues to possess three sealed radioactive sources under its State of California license. The licensee plans to transfer or dispose of these sources in the near future.

1 Research and Test Reactor Decommissioning; Decommissioning Inspection Procedure for Materials Licensees (69013 and 87104)

1.1 Inspection Scope

The inspectors reviewed the licensee's control and oversight of licensed activities.

1.2 Observations and Findings

a. Management Organization and Controls

The NRC inspectors reviewed the licensee's staffing, and compared the staffing to the requirements presented in the technical specifications for the two reactors. (The technical specifications are attachments to the two NRC licenses.) The licensee had staffed all required positions with qualified staff. The licensing, safety & nuclear compliance manager was responsible for radiation safety. The health physics manager reported directly to this individual. The decommissioning project manager and TRIGA reactor physicist-in-charge both reported to the vice president-research & development and functionally reported to the licensing, safety & nuclear compliance manager. In summary, the licensee's organizational structure was staffed in accordance with license requirements, and the licensee had sufficient staff for the work in progress.

In accordance with the technical specifications for each reactor, the licensee is required to maintain written instructions for emergency and abnormal conditions. Emergency instructions are provided in Procedure TRF-EP-01, "Emergency Procedures-TRIGA Reactor Facility," dated June 2013. This procedure establishes the emergency response organization, emergency classifications (unusual event and alert), emergency response procedures, and emergency response equipment. The procedure TRF-EP-01 provides instructions for medical emergencies, fires, security events, earthquakes, structural damage, and radiation releases. In summary, the licensee continues to maintain written instructions for emergency and abnormal conditions.

The inspectors attempted to determine if the licensee conducted surveillance and maintenance activities for the TRIGA Mark I and Mark F reactor facilities in accordance with requirements outlined in the current reactor license conditions. The inspectors interviewed site staff and reviewed selected logs for daily, weekly, and monthly maintenance and surveillance activities and noted that these activities were performed and recorded as required. The inspectors also reviewed the TRIGA reactor facility decommissioning logbook and observed that, in addition to the log entries for scheduled routine maintenance items, corrective maintenance items were identified for corrective action. However, the logbook did not always provide an entry to document that the corrective maintenance items had been resolved. The inspectors noted that the maintenance activities performed on the TRIGA Mark I and Mark F reactor facilities were all minor in nature since the last NRC inspection was performed in 2012. In summary, the inspectors noted that the licensee continued to perform maintenance and surveillance activities in accordance with license requirements.

b. Work Controls

According to each license, the licensee is authorized to conduct decommissioning. The licensee conducts this decommissioning in accordance with the General Atomics TRIGA Reactor Facility Decommissioning Plan dated July 1999. The inspectors discussed the status of decommissioning with licensee representatives and toured the two reactors to observe the status of decommissioning.

The licensee's records indicate that it released the Mark F pool water during July-November 2012. The total amount of fluid released was estimated to be 16,000 gallons. The water was released in 1,000-gallon batches. The water was filtered prior to release. The licensee's records indicate that no radioactive contamination was detected above background levels in any of the batch samples. All batches were discharged to the licensee's sanitary sewer outfall without incident.

During May 2013, the licensee conducted core sampling of the Mark F reactor pit floor and walls as well as the fuel storage canal wall. Five locations were sampled, with sampled locations varying in depth between 1-4 inches deep. A total of 19 samples were collected. After the completion of sampling, the licensee cleaned the floor of the pit to remove all residual contamination. The licensee subsequently painted portions of the pit to ensure that loose contaminants remained in place. The preliminary sample results indicate that the epoxy and gunnite wall layers contained lead, cadmium, cobalt-60, cesium-137, and europium-154 contamination. The combination of lead and cadmium with radioactive contamination suggests that some of these samples may be classified as mixed wastes for disposal purposes. Immediately after the onsite inspection, the licensee planned to collect more samples from the Mark F reactor pit area to further delineate the lead and cadmium contamination.

At some point in the future, the licensee plans to develop a remediation plan and decontaminate the surfaces containing mixed waste contamination. These mixed wastes may have to be processed and disposed separately from the remainder of the radioactive wastes. Because the decommissioning plan does not clearly address the reclamation of lead and cadmium, in conjunction with remediation of radioactive contamination, the licensee may have to revise the decommissioning plan to address its remediation of these mixed wastes.

In the near future, the licensee plans to drill through the 1-foot thick concrete biological shield and 2-foot thick concrete floor to sample the concrete walls and soil behind the walls for radiological contamination. This information is needed, in part, to determine how much volumetric material will need to be remediated and whether structural supports are needed during these decontamination efforts.

At the time of the onsite inspection, the licensee had suspended the decommissioning of the Mark I reactor, pending completion of the characterization of the Mark F reactor pit, biological shield, and surrounding soil. The Mark I reactor continues to have europium-152 and europium-154 contamination in the concrete walls of the former pool pit. The licensee plans to remediate this contamination at some future date, concurrent with final remediation of the Mark F facility.

Areas of the site that still require decommissioning, final surveys, and free-release include the various rooms and pits that housed the two former reactors, the front yard of the reactor facility (location where the radioactive wastes were being stored, packaged, and shipped), and the back yard of the facility (area where the former cooling tower equipment was previously located).

In summary, the inspectors confirmed that the licensee continued to conduct site decommissioning in accordance with the decommissioning plan dated July 1999. The licensee may have to update the decommissioning plan, as necessary, to address the remediation of the mixed wastes.

c. Radiation Protection

The inspectors reviewed the licensee's radiation protection program to verify compliance with 10 CFR Part 20 and license requirements. The inspectors reviewed the licensee's occupational exposure records for 2012 to ensure that no individual had exceeded the limits specified in 10 CFR 20.1201. The licensee monitored 40 employees for radiation exposure who were authorized to work on the TRIGA reactor facilities during 2012. The highest recorded annual dose for an employee was 107 millirems, a small fraction of the 5000-millirem limit specified in 10 CFR 20.1201. Personnel doses were primarily a result of the inspection of neutron-activated stainless steel items in the Mark F reactor pool, loading of these items into waste disposal boxes, and subsequent shipment of these boxes.

The inspectors conducted a site tour to observe the radiation protection controls in place at the time of the inspection and to ensure compliance with regulatory requirements. Specifically, the inspectors determined the following:

- The radiation work permit process and associated briefing provided appropriate information, including recent dose and contamination survey data, and complied with regulatory requirements

- Restricted areas and radioactive materials were posted and labeled in accordance with 10 CFR 20, Subpart J requirements

- Access to radioactive materials and contaminated areas was being controlled in accordance with 10 CFR 20, Subpart I requirements

- Individuals followed requirements of the applicable radiation work permit during the tour and completed adequate surveying of hands and feet after completion of the tour

In summary, the licensee implemented its radiation protection program in accordance with license and regulatory requirements.

d. Instrument Calibrations

The inspectors conducted a review of maintenance and calibration of radiation detection instrumentation. The inspectors noted that site personnel correctly used instrumentation when performing area surveys. Instruments in use were calibrated and had been source

checked as required. Also, instruments in use were capable of detecting radiation for the type and at the levels expected for the location of usage. In summary, the licensee's instrumentation program was found to be in compliance with site procedures.

Under its State of California license, the licensee conducts instrument calibrations for Sequoyah Fuels Corporation (SFC). During the NRC's April 2013 inspection at SFC, documented in NRC Inspection Report 040-08027/13-002 dated July 2, 2013, SFC was cited for its failure to maintain documentation to demonstrate that only properly calibrated and maintained equipment was used during decommissioning. In response to the NRC's findings at SFC, General Atomics conducted an internal investigation during May 2013. The cause of the problem was traced, in part, to an obsolete instrument calibration database. General Atomics' investigation resulted in several proposed corrective actions including the development of a new calibration recordkeeping database and updated calibration procedures.

Based on interviews of SFC and General Atomics staff, the NRC concluded that the survey instruments in use at both SFC and General Atomics were properly calibrated; however, the calibration documentation did not always reflect the actual calibration performed. One reason for the inconsistent documentation was traced to the software being used by the laboratory technician. The licensee's internal investigation also acknowledged that its annual quality assurance audit had failed to identify the problem in advance of the NRC's April 2013 inspection findings.

During this inspection, the inspectors conducted an onsite review of the status of General Atomics' corrective actions. The licensee had updated, rescinded, and created new site procedures as necessary. Also, the inspectors noted that a new electronic instrument calibration database had been created. In summary, once notified about the documentation inconsistencies, the licensee implemented corrective actions that should prevent future problems from reoccurring.

e. Effluent Control and Environmental Monitoring

The inspectors reviewed the effluent control and environmental monitoring programs to verify compliance with 10 CFR Part 20 and license requirements. In accordance with 10 CFR 70.59, the licensee provides semiannual effluent reports to the NRC and the State of California. Table 1 of these reports provides details of radiological gaseous and particulate effluent releases to unrestricted areas from licensee facilities handling radioactive material. Release point designations are keyed to facility names and locations. Attachment A of the report provides details of airborne effluent stack samples for the reporting period. Table 2 of the report documents any liquid effluent releases to the sanitary sewer system which flows to a 100-million gallon per day sewage treatment plant.

The inspectors interviewed site staff and reviewed the reports for the periods of July 1, 2012, through December 31, 2012, and January 1, 2013, through June 30, 2013. The information presented in the reports verifies the licensee's compliance with applicable regulations and reporting limits. The licensee also submitted the semiannual effluent reports to the NRC in a timely manner. Estimated doses to members of the public from air emissions were below the dose constraint specified in regulations.

The inspectors reviewed the TRIGA reactor facilities annual reports for 2012 and noted that the environmental monitoring program had remained essentially unchanged from the previous year. The inspectors also reviewed the monitoring equipment and actions used to implement the environmental monitoring program and determined that the licensee continued to collect, analyze, and record environmental samples to ensure compliance with license and regulatory requirements.

f. Solid Radioactive Waste Management and Transportation

Since the previous inspection, conducted in October 2012, the licensee made two shipments of radioactive material. The first shipment occurred in June 2013 and involved two containers of limited amounts of SNM. This shipment consisted of small quantities of high temperature gas reactor fuel samples, packaged within two 55-gallon drums. The drums were classified as Type A packages. The SNM was shipped to Oak Ridge National Laboratory. Each drum contained less than 15 grams of fissile material to comply with the fissile material exceptions as provided in U.S. Department of Transportation regulation 49 CFR 173.453. Based on the measured external exposure rates, both packages were labeled with White I labels as stipulated in regulation 49 CFR 172.403.

The second shipment consisted of five boxes containing contaminated or activated metal, water treatment system components, and unirradiated fuel originally destined for a high temperature gas reactor. The licensee shipped approximately 75 grams of fuel, distributed evenly across the five boxes. The licensee shipped the material to the Nevada National Security Site for disposal. The material was packaged as Low Specific Activity LSA-II material, and the boxes were designated as IP-1 packages. The boxes were labeled based on external exposure rates. The shipment was designated as an exclusive use shipment. The licensee shipped the waste material in July 2013.

The inspectors reviewed the shipment documentation with licensee representatives, and interviewed staff responsible for the shipments. The inspectors concluded that the licensee conducted the shipments in accordance with Department of Transportation regulations.

1.3 Conclusion

In summary, the licensee conducted site activities in accordance with license and regulatory requirements. The licensee maintained site staffing in accordance with license requirements, and sufficient staff was available for the work in progress. The licensee continued to maintain written procedures for emergency and abnormal conditions in accordance with license requirements. Further, the licensee continued to conduct and document the maintenance and surveillance activities as required by the license.

The inspectors confirmed that the licensee continued to conduct site decommissioning in accordance with the decommissioning plan dated July 1999. The licensee may have to update the decommissioning plan, as necessary, to address the remediation of mixed wastes.

The licensee implemented its radiation protection program in accordance with license and regulatory requirements. The licensee monitored workers for occupational exposures, and no individual exceeded the regulatory limits during the period examined

The licensee's instrumentation program was found to be in compliance with site procedures. In response to a previous NRC inspection finding at the Sequoyah Fuels Corporation site in Gore, Oklahoma, the licensee conducted an internal investigation to understand why it had supplied Sequoyah Fuels with calibrated meters with inconsistent documentation. Once notified about the documentation inconsistencies, the licensee implemented corrective actions that should prevent future problems with calibration records.

The licensee implemented its effluent control and environmental monitoring programs in accordance with license and regulatory requirements. All required samples were collected, and no sample result exceeded any license or regulatory limit.

The licensee conducted transportation activities in accordance with Department of Transportation regulations.

2 Exit Meeting Summary

The inspectors presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on October 30, 2013. The licensee did not identify as proprietary any information provided to or reviewed by the inspectors.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

K. Asmussen, Director, Licensing, Safety and Nuclear Compliance
J. Greenwood, Manager, TRIGA Reactor
P. Pater, Manager, Health Physics
J. Razvi, Chair, Compliance and Radiation Safety Working Group

INSPECTION PROCEDURES USED

IP 69013	Status of Decommissioning
IP 87104	Decommissioning Inspection Procedure for Materials Licensees

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access & Management System
CFR	*Code of Federal Regulations*
IP	Inspection procedure
NRC	U.S. Nuclear Regulatory Commission
SFC	Sequoyah Fuels Corporation
SNM	special nuclear material