



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

July 21, 2005

Mr. James Randall Walti
Vice President and General Counsel
General Atomics
P.O. Box 85608
San Diego, California 92186-9784

SUBJECT: NRC INSPECTION REPORT 070-00734/05-001

Dear Mr. Walti:

This refers to the inspection conducted on June 6-9, 2005, at the General Atomics facility 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. A preliminary exit briefing was held with your staff at the conclusion of the onsite inspection, and a final telephonic exit briefing was held with Ms. Laura Gonzales on July 20, 2005. No violations were identified; therefore, no response to this letter is required.

A confirmatory survey was conducted during the inspection at the former Nuclear Waste Processing Facility. The survey included measurement of ambient gamma exposure rates, measurement of fixed (total) contamination on outdoor concrete and asphalt surfaces, and collection of soil samples. All survey results were below the NRC-approved release criteria suggesting that the area had been effectively remediated.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) 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 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 Mr. Robert Evans, Senior Health Physicist, at (817) 860-8234 or the undersigned at (817) 860-8191.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

General Atomics

-2-

Docket No.: 70-734
License No.: SNM-696

Enclosure:
NRC Inspection Report
070-00734/05-001

cc w/Enclosure:
Dr. K. E. Asmussen, Director
Licensing, Safety and Nuclear Compliance
P.O. Box 85608
San Diego, California 92186-9784

Ed Bailey, Chief
Radiologic Health Branch
P.O. Box 997414 MS 7610
Sacramento, CA 95899-7414

bcc w/enclosure (via ADAMS e-mail distribution):

LDWert

MNBaker, NMSS/FCSS/FCFB

DBSpitzberg

RJEvans

BASchlapper

KEGardin

RIV Nuclear Materials File - 5th Floor

SISP Review Completed: RJE

ADAMS: : Yes No Initials: RJE

: Publicly Available Non-Publicly Available Sensitive : Non-Sensitive

DOCUMENT NAME: s:\dnms\!fcd\!rje\50073401.wpd final r:_dnms\50073401.wpd

| | | |
|---------------|-------------|-------------|
| RIV:DNMS:FCDB | FCDB | C:FCDB |
| RJEvans | BASchlapper | DBSpitzberg |
| <u>/RA/</u> | <u>/RA/</u> | <u>/RA/</u> |
| 07/21/05 | 07/21/05 | 07/21/05 |

OFFICIAL RECORD COPY

T=Telephone

E=E-mail

F=Fax

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 070-00734

License No.: SNM-696

Report No.: 070-00734/05-001

Licensee: General Atomics

Location: 3550 General Atomics Court
San Diego, California 92121

Dates: June 6-9, 2005

Inspector: Robert Evans, P.E., C.H.P., Senior Health Physicist
Fuel Cycle & Decommissioning Branch

Accompanied By: Beth A. Schapper, Health Physicist
Fuel Cycle & Decommissioning Branch

Approved by: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

General Atomics
NRC Inspection Report 070-00734/05-001

This routine, announced inspection focused on management organization and controls, operational safety review, radiation protection, operator training, maintenance and surveillance, radioactive waste operations, environmental protection, emergency preparedness, and radioactive waste transportation. In addition, a confirmatory survey was conducted in the vicinity of the former Nuclear Waste Processing Facility. Overall, the licensee was conducting operations in accordance with the conditions of the license and the Site Decommissioning Plan.

Management Organization and Controls

- The licensee's organization was consistent with the license and the NRC-approved Site Decommissioning Plan. Audits performed by the licensee were found to be comprehensive and provided an appropriate review of the site radiological protection program (Section 1).

Operational Safety Review/Decommissioning Inspection

- The licensee continued to maintain adequate control over remaining radioactive material. Posting of the former Nuclear Waste Processing Facility was no longer necessary because the area had been effectively remediated (Section 2).
- At the time of the inspection, the license possession limits were in error, although the inspectors confirmed that the licensee did not possess radioactive material in excess of the correct limits. The licensee submitted a license amendment request to the NRC after the conclusion of the onsite inspection to correct the license error (Section 2).

Radiation Protection

- The licensee's records indicate that no individual exceeded the regulatory limit for occupational doses (Section 3).

Operator Training/Retraining

- The training program for workers had been implemented in accordance with the license and regulatory requirements (Section 4).

Maintenance and Surveillance Testing

- The licensee had an effective program to assure that radiation survey instruments were maintained operable and in calibration (Section 5).

Radioactive Waste Management and Waste Generator Requirements

- The licensee continued to maintain control over wastes generated from decommissioning activities. In the near future, the licensee plans to transfer the remainder of the special nuclear material to either its State or NRC non-power reactor licenses (Section 6).

Transportation of Radioactive Materials

- The licensee's shipping papers were in compliance with regulatory requirements for the transportation of licensed material (Section 7).

Environmental Protection

- The licensee implemented an environmental and effluent monitoring program as required by the license. All required samples were collected, and no regulatory limit was exceeded. The doses to members of the public were below regulatory and reportability limits (Section 8).

Emergency Preparedness

- The licensee had an emergency preparedness program that met the commitments of the Radiological Contingency Plan (Section 9).

Closeout Inspection and Survey

- The inspectors conducted a confirmatory survey of the former Nuclear Waste Processing Facility. The confirmatory survey sample results were below the NRC-approved acceptance criteria for ambient exposure rate, fixed (total) surface contamination, and contamination in soil. The results of the confirmatory survey suggest that the licensee had effectively remediated the area around the former Nuclear Waste Processing Facility (Section 10).

Follow-Up

- Two Inspection Follow-up Items identified during previous inspections were closed (Section 11).

Report Details

Summary of Plant Status

At the time of the inspection, most activities involving special nuclear material (SNM) had been permanently discontinued. Most areas of the site had been remediated and final surveyed. Limited decommissioning and decontamination activities were still in progress in the vicinity of the former research reactor facility.

The licensee continued to possess SNM in the form of two irradiated fuel elements, research and development historical samples, a disk standard, and a calibration source. The licensee plans to transfer these materials to its State of California or NRC research reactor licenses in the near future. The licensee continued to possess additional SNM under its NRC research reactor licenses R-38 and R-67.

1 Management Organization and Controls (88005)

1.1 Inspection Scope

The inspectors reviewed and discussed organization and staffing changes, internal reviews and audits, safety committee activities, and quality assurance requirements.

1.2 Observations and Findings

The current site organization was reviewed and found to be in agreement with Part II, Section 3, "Organization and Administrative Procedures," of the license and Section 4.1 and 4.2 of the Site Decommissioning Plan. There have been minor changes in the management structure since the last inspection, but the current organization was consistent with Site Decommissioning Plan requirements.

License Condition S-5 specifies the requirements for the Criticality and Radiation Safety Committee (CRSC). The inspectors reviewed the Annual CRSC meeting minutes dated December 13, 2004. This meeting was held simultaneously with the annual as low as reasonably achievable (ALARA) meeting. In addition, the inspectors reviewed the CRSC audit report dated December 6, 2004, for the period covering October 28 through November 24, 2004. The annual audit was a compilation of individual audits of each major program area. Audits were reviewed and found to be comprehensive and detailed, and provided a thorough review of the implementation of the site radiological protection program. No adverse findings were noted in the annual audit. The corrective action plans for previous audits were well documented and were being tracked to completion. The inspectors determined that the CRSC continued to function as stipulated by the license.

1.3 Conclusions

The licensee's organization was consistent with the license and the NRC-approved Site Decommissioning Plan. Audits performed by the licensee were found to be

comprehensive and provided an appropriate review of the site radiological protection program.

2 Operational Safety Review/Decommissioning Inspection (88020, 88104)

2.1 Inspection Scope

The inspectors reviewed general facility operations to verify adherence to operational safety requirements as required by the license and operating procedures.

2.2 Observations and Findings

A site tour of the area surrounding Building 41, the area of the former Nuclear Waste Processing Facility (NWPF), was conducted. This area was not posted as a radioactive materials area because the area had been previously remediated. Confirmatory surveys were conducted in this area of the facility during the inspection, and the inspectors did not identify any areas above background values. Therefore, the area did not require radioactive material postings.

A tour was conducted in the areas where the licensee continued to store research reactor fuel. The building was posted as a radiologically restricted area. Area fences, building door locks, and electronic security features were in place. Radiological postings were present in and around the building. The inspectors noted that the licensee continues to maintain five criticality alarms in the building.

The inspectors compared the amount of radioactive material in possession of the licensee to the limits specified in Amendment 82 to NRC Materials License SNM-696. The inspectors concluded that the license limits were in error. Amendment 77 to the license erroneously increased the possession limit from 1,000 grams to 5,000 grams. This licensing error was significant, in part, because it required an increase in security requirements. During the inspection, the licensee was confirmed to possess SNM in quantities well below the 1,000 gram limit. Therefore, this issue was not a nuclear safety or security concern. Following consultation with the NRC project manager, the licensee submitted a license amendment request to the NRC on June 30, 2005, to correct the possession limit error.

2.3 Conclusions

The licensee continued to maintain adequate control over all remaining radioactive material. Posting of the former NWPF was no longer necessary because the area had been effectively remediated.

At the time of the inspection, the license possession limits were in error, although the inspectors confirmed that the licensee did not possess radioactive material in excess of the correct limits. The licensee submitted a license amendment request to the NRC after the conclusion of the onsite inspection to correct the license error.

3 Radiation Protection (83822)

3.1 Inspection Scope

The purpose of this portion of the inspection was to determine whether the licensee had implemented its radiation protection program in accordance with regulatory requirements and license conditions.

3.2 Observations and Findings

Occupational exposures were reviewed to ensure that no individual had exceeded the regulatory limits provided in 10 CFR Part 20. The licensee monitored individuals for external exposures only. Monitoring of internal exposures had been previously discontinued by the licensee as allowed by 10 CFR 20.1502 because internal exposures were below 10-percent of the applicable limits.

The licensee's occupational exposure records for calendar year 2004 and the first quarter of 2005 were reviewed. During 2004, 14 individuals were required to be monitored under NRC Licenses SNM-696, R-38, and R-67. The highest exposure was 0.011 rems, well below the 5 rems per year total effective dose equivalent limit specified in 10 CFR 20.1201(a).

3.3 Conclusions

The licensee's records indicate that no individual exceeded the regulatory limit for occupational doses.

4 Operator Training, Retraining (88010)

4.1 Inspection Scope

The licensee's training program was reviewed to verify if personnel were being properly trained in accordance with requirements of 10 CFR Part 19, the license, and the Site Decommissioning Plan.

4.2 Observations and Findings

License Condition S-7 requires that radiation safety training be given to all new employees; License Condition S-8 requires radiation safety and indoctrination training be conducted by the health physics manager or by a similarly qualified individual; and the Site Decommissioning Plan, Section 4.4, "Training," and Section 4.4.1, "Training/Retraining," requires training for all personnel working on decommissioning projects. The facility staff consisted of permanent workers and contract workers. The inspectors examined the licensee's records to ensure that the training program had been implemented as required.

General Employee Radiation Training was presented on January 31, 2005, February 9, 2005 and April 14, 2005. Radiological Refresher Safety Training was presented on

February 8, 2005, May 17, 2005 and May 19, 2005. The licensee had training records on file for each worker. Records were reviewed for general employee radiological training, radiological worker initial and refresher training, emergency response training, criticality safety training and respiratory protection training. The training records included the person, date, type of training, test score and the instructor. Personnel were knowledgeable of their job functions and responsibilities based on observations of work performance by the inspectors.

Additionally, the inspectors reviewed the implementation of the Radiological Contingency Plan that was issued in January 2005. The required individuals had been notified of the changes, and new Directors and Alternates were requested to incorporate the updated Plan into their required training and to complete a read and sign by March 2005.

4.3 Conclusions

The training program for workers had been implemented in accordance with license and regulatory requirements.

5 Maintenance and Surveillance Testing (88025)

5.1 Inspection Scope

The licensee's method for controlling and testing radiation survey instruments was reviewed.

5.2 Observations and Findings

Regulation 10 CFR 70.38(j)(2)(ii) states that a licensee is required to specify the survey instruments used as part of the final survey and to certify that each instrument is properly calibrated and tested. Personnel responsible for the use, testing and calibration of radiation survey instruments were interviewed. The inspectors toured the calibration laboratory. All calibrations had been conducted using sources that were traceable to the National Institute for Standards and Technology.

A selection of calibration records were reviewed. These records included the source standard information, calibration range, initial and final instrument readings, efficiency, instrument location, description and serial number.

The monthly list of instruments to be calibrated was also reviewed. Most instruments were calibrated at 3- and 6-month intervals depending on frequency of use. Instruments observed in use at the facility appeared fully functional and were current in their calibration intervals. The inspectors also conducted a review of the Radiological Contingency Plan requirements, and instrumentation and protective equipment required by the Plan were accessible to health physics personnel and within calibration intervals.

5.3 Conclusions

The licensee had an effective program to assure that radiation survey instruments were maintained operable and calibrated.

6 Radioactive Waste Management/Waste Generator Requirements (88035, 84850)

6.1 Inspection Scope

The radioactive waste management program was evaluated to review the effectiveness of controls over wastes generated from building decontamination, decommissioning and soil excavation activities.

6.2 Observations and Findings

Regulation 10 CFR 70.38(j)(1) states that as a final step in decommissioning, the licensee shall certify the disposition of all licensed material, including accumulated wastes. The inspector interviewed personnel and reviewed pertinent records to ascertain the status of all remaining SNM. The licensee plans to transfer the remaining SNM material to one of its NRC or State licenses in the near future.

Since the previous inspection, a disk standard was sectioned into smaller pieces and shipped for disposal to an out-of-state disposal site during August 2004. The remainder of the low level wastes was shipped for disposal during June 2004.

6.3 Conclusions

The licensee continued to maintain control over wastes generated from decommissioning activities. In the near future, the licensee plans to transfer the remainder of the SNM to either its State or NRC non-power reactor licenses.

7 Transportation of Radioactive Materials (86740)

7.1 Inspection Scope

The licensee's program for packaging and shipment of radioactive waste generated during decommissioning was reviewed for compliance with applicable transportation regulations.

7.2 Observations and Findings

During 2004, the licensee shipped radioactive wastes to an out-of-state disposal site. The inspectors reviewed the shipping paperwork for the last two shipments to ensure compliance with requirements of 10 CFR 71.5, Transportation of Licensed Material. At the time of the inspection, the remaining SNM expected to be disposed consisted of archived radiological survey samples.

On June 22, 2004, the licensee shipped one box and one drum of low level waste from the former NWPf to the Nevada Test Site/U.S. Department of Energy. On August 18, 2004, the licensee shipped four boxes and twelve drums of rubble and equipment from the former NWPf and Building 21 (non-power reactor building) to the Nevada Test Site. The inspectors reviewed the shipping papers and confirmed compliance with regulatory requirements. The papers included a bill of lading, shipper's instructions, and documentation of radiological surveys of the boxes, drums and transport vehicles.

7.3 Conclusions

The licensee's shipping papers were in compliance with regulatory requirements for the transportation of licensed material.

8 Environmental Protection (88045)

8.1 Inspection Scope

The licensee's environmental monitoring program was reviewed to determine compliance with the Site Decommissioning Plan and applicable regulations.

8.2 Observations and Findings

By letter dated February 11, 2004, the licensee requested a reduction in the environmental monitoring program requirements. The NRC granted the request via Amendment 81 to the license dated May 21, 2004. The licensee continued to maintain the environmental monitoring program until July 21, 2004, when the State of California also granted the licensee's request to downgrade the program. At that time, the licensee permanently discontinued environmental air sampling, annual soil and water sampling, and external gamma radiation monitoring at the environmental air sampling stations.

The environmental monitoring program currently consists of airborne effluent monitoring and sewage sampling. During 2004, airborne effluents were released from two NRC-licensed locations, the non-power reactor rooms in Building 21 and the health physics laboratory in Building 10. Air samples were collected weekly and analyzed for presence of iodine and mixed fission products. The inspectors compared the sample results to the licensee's alert levels. No sample result exceeded the alert levels. The releases were reported to the NRC in semi-annual reports in accordance with the requirements of 10 CFR 70.59.

The licensee committed in Section 6.1 of the license application to estimate the dose due to airborne radioactive emissions to the closest member of the public. Doses greater than 10 millirems per year are reportable to the NRC in accordance with the requirements of 10 CFR 20.1101(d). The licensee conducted the assessment for 2004 during March 2005. Using the NRC-approved COMPLY computer code, the licensee estimated a fence-line dose of 0.037 millirems per year. This calculated dose was well below the reportability limit of 10 millirems per year.

Regulation 10 CFR 20.1301(a) specifies a total effective dose equivalent limit of 100 millirems for individual members of the public. The licensee estimated the doses to members of the public that worked on site during 2004. These doses were calculated to be less than 2 millirems for the main site and less than 3 millirems for the Sorrento Valley site. These estimated doses were well below the regulatory limit of 100 millirems per year.

The licensee also sampled effluent sewage from two locations for gross alpha and beta concentrations. No action level was specified in the license application for sewage, although site procedures specified an action level of 100 pCi/l. One sample result collected during September 2004 (103 pCi/l) slightly exceeded the procedural action level of 100 pCi/l. The licensee continued to ensure that the monthly average concentration of liquid releases to sewers did not exceed the limits specified in 10 CFR 20.2003 and 10 CFR Part 20, Appendix B, Table 3.

8.3 Conclusions

The licensee implemented an environmental and effluent monitoring program as required by the license. All required samples were collected, and no regulatory limit was exceeded. The doses to members of the public were below regulatory and reportability limits.

9 Emergency Preparedness (88050)

9.1 Inspection Scope

The licensee's emergency preparedness program was reviewed to determine if it was adequate for decommissioning activities.

9.2 Observations and Findings

License Condition S-23 requires the licensee to maintain and execute the response measures as described in the Emergency Plan. The licensee's Radiological Contingency Plan, also referred to as the Emergency Plan, was discussed with the health physics personnel to review response actions expected during an emergency. Site personnel were generally aware of their responsibilities if an emergency situation were to occur.

The Radiological Contingency Plan was revised during January 2005. The revision provided updated names, phone numbers, radiological materials storage areas, and present SNM storage locations. The revision also deleted the weather station located in Sorrento Valley since the NWPF had been decommissioned, although the weather station at the licensee's main facility remained in service.

9.3 Conclusions

The licensee had an emergency preparedness program that met the commitments of the Radiological Contingency Plan.

10 Closeout Inspection and Survey (83890)

10.1 Inspection Scope

The purpose of this portion of the inspection was to verify if portions of the site had been decontaminated to acceptable radiological levels for unrestricted use, and to ensure that the final survey had been performed as stated in the Site Decommissioning Plan.

10.2 Observations and Findings

A confirmatory survey was conducted of the area surrounding Building 41, the former NWPF, at the Sorrento Valley Site. The confirmatory survey was conducted to verify the results of the licensee's final status surveys, submitted to the NRC by letters dated March 23, 2005 and May 25, 2005. The total land area of the two parcels was about 96,000 ft².

The licensee's final status survey plan was provided in Section 6 of the NRC-approved Site Decommissioning Plan. Included in Section 6 were acceptance criteria for gamma exposure rate, surface contamination, and soil concentration limits. The inspectors conducted gamma exposure rate and surface contamination measurements and collected soil samples at the NWPF and surrounding land for comparison to the limits provided in the Site Decommissioning Plan.

The ambient gamma exposure rates were measured using a Ludlum Model 19 microRoentgen meter (NRC No. 015544, calibration due date of 11/16/05). This survey meter was calibration checked by the licensee just prior to the confirmatory survey and was found to be functioning correctly. The ambient gamma exposure rates were measured using a Ludlum Model 18 count rate meter (NRC No. 012778, calibration due date of 11/10/05) with a SPA-3 sodium iodide probe. This meter was used to identify elevated areas for soil sampling.

The inspectors conducted surface surveys for beta particle contamination on concrete and asphalt surfaces using an Eberline E600 survey meter (NRC No. 063472, calibration due date of 12/08/05) with SHP380AB alpha-beta probe. The surveys included both scan and fixed point surveys. Fixed point measurements were collected for comparison to the acceptance criteria limits.

Prior to conducting the confirmatory survey, the inspectors collected background measurements in an unimpacted area adjacent to Buildings 13 and 15, the same area used by the licensee. Background measurements were collected on concrete, asphalt, and soil surfaces. Depending on the surface, the background measurements ranged from 15-22 $\mu\text{R/hr}$ for the Model 19 microRoentgen meter and 262-388 cpm for the Eberline E600 survey meter.

During the confirmatory survey, the inspectors conducted ambient gamma exposure rate measurements using the Ludlum Model 19 survey meter for comparison to the acceptance criteria limit of 10 $\mu\text{R/hr}$ above background. The gross measurements at NWPF ranged from 15-23 $\mu\text{R/hr}$ at 1-meter above the ground. No location was

measured with exposure rates greater than the acceptance criteria limit of 10 $\mu\text{R/hr}$ above background.

The inspectors conducted measurements of concrete surfaces using the Eberline E600 survey meter. The inspectors conducted scan surveys to locate areas of potential contamination. A total of 59 1-minute counts were collected on concrete surfaces. With a background of 262 cpm, the retaining wall behind Building 41 ranged from 206 to 361 cpm with an average of 261 cpm. The concrete at the rear of Building 41 ranged from 209 to 348 cpm with an average of 257 cpm. The front and side areas of Building 41 ranged from 191 to 415 cpm with an average of 312 cpm. A specific location on the concrete walkway in front of Building 41 appeared to exhibit elevated count rate readings, up to 415 cpm, but the area was less than a square meter in size. The inspectors also collected seven 1-minute fixed point measurements of asphalt surfaces. With a background of 388 cpm, these measurements ranged from 280-397 cpm with an average of 319 cpm.

The inspectors compared the fixed point sample results to the release criteria provided in Table 6-1, "Acceptable Surface Contamination Levels," of the Site Decommissioning Plan. The combined instrument and source efficiencies were 6.56-percent for beta particles. Accordingly, the highest sample point (415 cpm), measured on a concrete sidewalk, was 153 cpm, or 2,332 dpm/100 cm^2 , above background. This sample result was below the maximum surface contamination level of 15,000 dpm/100 cm^2 specified in Table 6-1. The average sample result for concrete was 12 cpm, or 183 dpm/100 cm^2 , above background. This value was below the average surface contamination release limit of 5,000 dpm/100 cm^2 specified in Table 6-1.

The inspectors also compared the asphalt sample results to the acceptance criteria. With a background of 388 cpm, the highest sample result of 397 cpm was only 9 cpm, or 137 dpm/100 cm^2 , above background. The average asphalt surface measurement (319 cpm) was below the average background value (388 cpm) suggesting that the asphalt surfaces did not contain residual radioactive material.

The inspectors did not conduct sampling for removable contamination. The concrete sidewalk in front of Building 41, the area with the highest sample result, was not sampled because the rough concrete surfaces were not conducive for the collection of swipe samples. All other locations had fixed point sample results that were below the removable contamination release criteria of 1,000 dpm/100 cm^2 .

Seven soil samples were collected and split with the licensee. The NRC's samples were submitted to Oak Ridge Institute for Science and Education (ORISE) for analysis. Both sets of samples were analyzed by gamma spectroscopy. The sample results revealed measurable amounts of cesium-137, thorium, and uranium. None of the sample results were corrected for background values. The sample results, and associated acceptance criteria from Table 6-2 of the Site Decommissioning Plan, are provided below:

Table 1: Cesium-137 Sample Results, in picocuries per gram (pCi/g)

| Sample ID | Cesium-137 (ORISE) | Cesium-137 (General Atomics) | Release Criteria for Cesium-137 |
|---------------|--------------------|------------------------------|---------------------------------|
| NRC 05 -01-01 | 0.07 ± 0.02 | < 0.13 | 15 |
| NRC 05 -01-02 | 0.32 ± 0.04 | 0.18 ± 0.07 | 15 |
| NRC 05 -01-03 | 2.68 ± 0.13 | 2.50 ± 0.31 | 15 |
| NRC 05 -01-04 | 0.04 ± 0.03 | < 0.13 | 15 |
| NRC 05 -01-05 | 0.05 ± 0.02 | < 0.13 | 15 |
| NRC 05 -01-06 | 0.01 ± 0.02 | < 0.13 | 15 |
| NRC 05 -01-07 | 0.04 ± 0.02 | < 0.13 | 15 |

Table 2: Total Thorium Sample Results (in pCi/g)

| Sample ID | Total Thorium* (ORISE) | Total Thorium* (General Atomics) | Release Criteria for Thorium |
|---------------|------------------------|----------------------------------|------------------------------|
| NRC 05 -01-01 | 2.95 ± 0.22 | 3.65 ± 0.54 | 10 |
| NRC 05 -01-02 | 3.89 ± 0.28 | 3.93 ± 0.52 | 10 |
| NRC 05 -01-03 | 2.85 ± 0.26 | 3.31 ± 0.55 | 10 |
| NRC 05 -01-04 | 2.94 ± 0.26 | 3.61 ± 0.51 | 10 |
| NRC 05 -01-05 | 2.17 ± 0.19 | 3.39 ± 0.53 | 10 |
| NRC 05 -01-06 | 2.86 ± 0.22 | 3.12 ± 0.41 | 10 |
| NRC 05 -01-07 | 3.21 ± 0.25 | 2.94 ± 0.46 | 10 |

*Total thorium consists of the combination of thorium-228 by lead-212 and thorium-232 by actinium-228.

The release criteria specified in Table 6-2 of the Site Decommissioning Plan includes natural uranium, depleted uranium, and enriched uranium. The release criteria is 10, 35, and 30 pCi/g, respectively. Both ORISE and the licensee conducted gamma spectroscopy analyses to detect the uranium-238 and uranium-235 concentrations. The sample results were converted to a enriched uranium value for comparison to the 30-pCi/g release criteria, the most applicable of the three uranium release limits:

Table 3: Enriched Uranium Sample Results (pCi/g)

| Sample ID | Enriched Uranium* (ORISE) | Enriched Uranium* (General Atomics) | Release Criteria for Enriched Uranium |
|---------------|---------------------------|-------------------------------------|---------------------------------------|
| NRC 05 -01-01 | 8.3 ± 2.9 | 8.0 ± 3.1 | 30 |
| NRC 05 -01-02 | 3.8 ± 2.6 | 5.2 ± 2.6 | 30 |
| NRC 05 -01-03 | 6.3 ± 3.3 | 6.8 ± 2.4 | 30 |
| NRC 05 -01-04 | 2.9 ± 2.7 | 3.4 ± 2.0 | 30 |
| NRC 05 -01-05 | 3.8 ± 2.6 | 4.3 ± 2.2 | 30 |
| NRC 05 -01-06 | 5.0 ± 2.7 | 5.0 ± 2.2 | 30 |
| NRC 05 -01-07 | 4.8 ± 2.9 | 5.9 ± 2.6 | 30 |

*Enriched uranium is the sum of uranium-238 + uranium-235 + uranium-234 concentrations. Uranium-235 and uranium-238 concentrations were measured by ORISE and the licensee. Uranium-234 was calculated by multiplying the uranium-235 concentration by the standard ratio of 21.7. The method used to calculate enriched uranium activity was provided by ORISE and agreed with by the licensee.

In summary, all confirmatory soil sample results were below the respective NRC-approved acceptance criteria. In addition, the licensee's sample results were statistically comparable to ORISE's sample results.

10.3 Conclusions

The inspectors conducted a confirmatory survey of the former NWPF. The confirmatory survey sample results were below the NRC-approved acceptance criteria for ambient exposure rate, fixed (total) surface contamination, and contamination in soil. The results of the confirmatory survey suggest that the licensee had effectively remediated the area around the former NWPF.

11 **Followup (92701)**

70-734/0402-01 IFI Although the licensee had not completed a report on an event involving a contaminated glass-ware released off-site, preliminary evaluations on the item in question and all glass-ware recovered indicated that although there may have been some contamination on the inside surface of the glassware, the amount was below the licensee's release criteria. In addition, the contamination identified was not under the jurisdiction of the NRC's SNM license. The licensee's final conclusions were tracked as an Inspection Follow-up Item.

The licensee initiated an investigation to determine whether the radioactive material exceeded the limits set forth in 10 CFR Part 20 and whether the incident was reportable. The licensee's final investigation report was issued on September 1, 2004. The final report on the item in question, as well as all glass-ware recovered, indicated that although there may have been

some contamination on the inside surface of the glassware, the amount was below the licensee's release criteria. In addition, the contamination was not SNM and was not regulated by the NRC. Inspection Follow-up Item IFI 70-734/0402-01 was closed.

70-734/0402-02 IFI Although the current revision of the Radiological Contingency Plan updated most buildings and SNM storage locations, the Plan required additional updates to reflect decommissioned and demolished buildings and areas such as Buildings 41 and Building 25 site. The Contingency Plan should be updated to meet the commitments of Section 8 of the Site Decommissioning Plan. This was tracked as Inspection Follow-up Item.

The revised Radiological Contingency Plan, dated April 2001 and revised January 2005, was reviewed. The plan was revised to be consistent with the SNM-696 license and deleted references to facilities that have been decommissioned; i.e., Room 103A of Building 31 and the NWPF facility (Buildings 25 and 41). Inspection Follow-up Item 70-734/0402-02 was closed.

12 Exit Meeting Summary

The inspectors presented the inspection results to the licensee at the exit meeting on June 9, 2005. A final exit briefing was conducted with a representative of the licensee on July 20, 2005. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Laura Gonzales, GA Radiation Safety Officer/Health Physics Manager
William LaBonte, Lead Health Physicist, Hot Cell Facility
John Greenwood, Decommissioning Project Manager/TRIGA Rx. Facility Manager
Ed Rudgers, Health Physics Tech III
Imelda Cruz, Health Physics Senior Scientist
Mario Monreal, Calibration Laboratory Coordinator
Karen Schultz, Administration

Contractor

Richard Stowell, Senior Health Physicist

INSPECTION PROCEDURES USED

| | |
|----------|--------------------------------------|
| IP 88104 | Decommissioning Inspection |
| IP 88005 | Management Organization and Controls |
| IP 83822 | Radiation Protection |
| IP 83890 | Closeout Inspection and Survey |
| IP 88020 | Operational Safety Review |
| IP 88010 | Operator Training, Retraining |
| IP 88025 | Maintenance and Surveillance Testing |
| IP 84850 | Waste Generator Requirements |
| IP 88035 | Radioactive Waste Management |
| IP 86740 | Transportation |
| IP 88045 | Environmental Protection |
| IP 88050 | Emergency Preparedness |
| IP 92701 | Follow-Up |

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

| | | |
|----------------|-----|--|
| 70-734/0402-01 | IFI | Although the licensee had not completed a report on an event involving a contaminated glass-ware released off-site, preliminary evaluations on the item in question and all glass-ware recovered indicated that although there may have been some contamination on the inside surface of the glassware, the amount was below the |
|----------------|-----|--|

licensee's release criteria. In addition, the contamination identified was not under the jurisdiction of the NRC's SNM license.

70-734/0402-02 IFI Although the current revision of the Radiological Contingency Plan updated most buildings and SNM storage locations, the Plan required additional updates to reflect decommissioned and demolished buildings and areas such as Buildings 41 and Building 25 site. Presently, the outdated Contingency Plan did not diminish the overall effectiveness of the plan. However, the Contingency Plan should be updated to meet the commitments of Section 8 of the Site Decommissioning Plan.

Discussed

None

LIST OF ACRONYMS USED

| | |
|-------------------------|---|
| ALARA | As Low as Reasonably Achievable |
| CFR | Code of Federal Regulations |
| cpm | counts per minute |
| CRSC | Criticality and Radiation Safety Committee |
| dpm/100 cm ² | disintegrations per minute per 100 square centimeters |
| ft ² | square feet |
| GA | General Atomics |
| IFI | Inspection Follow-up Item |
| μR/hr | microRoentgens per hour |
| NWPF | Nuclear Waste Processing Facility |
| ORISE | Oak Ridge Institute for Science and Education |
| PDR | Public Document Room |
| pCi/g | picocuries per gram |
| pCi/l | picocuries per liter |
| SNM | Special Nuclear Material |