

THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
SAFETY EVALUATION RELATED TO APPROVING THE
GENERAL ATOMICS HOT CELL FACILITY DECOMMISSIONING PLAN

1.0 BACKGROUND

The Hot Cell Facility (HCF) is located on the General Atomics (GA) main site, which is a 242,760 square meters (60-acre) complex on Torrey Pines Mesa in San Diego, California. The GA main site is approximately 91.2 meters (300) feet above sea level, 1609 meters (1 mile) from the Pacific Ocean, and 20,917 meters (13 miles) northwest of downtown San Diego. The GA site is located in the center of Torrey Pines Mesa Science Center, a 1,229,984 square meters (304-acre) industrial park.

The HCF construction was completed in 1959, and has approximately 771 square meters (7,400 square feet) of laboratory and remote operations cells. Licensed operations at the HCF included receipt, handling, and shipment of radioactive materials; remote-handling examination, storage of previously irradiated fuel materials; engineering-scale tritium extraction operations and other new reactor development activities; and development, fabrication, and inspection of fuel materials. GA has maintained the HCF in primarily a surveillance and maintenance mode, in accordance with license conditions since 1991, when research and development activities at the HCF stopped. On December 14, 1994, GA notified the U. S. Nuclear Regulatory Commission of its intent to cease operations at its HCF located on this main site in San Diego, California.

2.0 PLANNED DECOMMISSIONING ACTIVITIES

2.1 Decommissioning Objective, Activities, Tasks, and Schedules

The purpose of the HCF decontamination and decommissioning is to remove all radiological and other contamination so the HCF can be released for unrestricted use. The structure will be removed and the yard area will be remediated as required. The total estimated exposure is estimated to be less than 0.35 person-Sv (35 person-rem).

Contaminated systems will be removed and disposed of as low-level radioactive waste. Two parallel activities will be taking place at the same time. One will be the decontamination and dismantlement of the rooms surrounding the main building structure, and the other will be the decontamination and dismantlement of the hot cells. The decontamination of the rooms will include a variety of techniques; the predominant one will be abrasive cleaning of the concrete surfaces. The interior of the cells will be cleaned by abrasive cleaning using remotely operated cleaning methods. After the hot cells are decontaminated, dismantlement of the Metallography Cell will start as the final decontamination of the remaining rooms in the facility is completed. The roof will then be removed to allow dismantlement of the remaining hot cells. This will be followed with the dismantlement of the remaining walls and slab.

After the HCF is dismantled, the affected soil surrounding the HCF will be remediated as necessary. Contaminated soil will be either shipped off-site to a temporary processing facility or shipped to a low-level radioactive waste disposal facility. Following completion of the decontamination/dismantlement, a final radiation survey will be conducted and documented. The purpose of the survey is to verify that radioactivity has been reduced to sufficiently low levels to allow release for unrestricted use. The final radiation survey for the



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 7, 1996

MEMORANDUM TO: Robert C. Pierson, Chief
Licensing Branch
Division of Fuel Cycle and Safeguards, NMSS

FROM: Michael F. Weber, Chief *Michael F. Weber*
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management, NMSS

SUBJECT: REVIEW OF THE GENERAL ATOMICS HOT CELL FACILITY
DECOMMISSIONING PLAN

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Attachment: As stated

Contact: Clayton L. Pittiglio, NMSS
415-6702

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HCF will consist of a direct radiation survey and sampling analysis of the HCF site/soil, since the facility will have been completely dismantled. NRC will perform a confirmatory survey.

Section 2.1.2, "Description/Analysis of Methods" of the Decommissioning Plan (DP) provides a detailed description of the building and surrounding area. The HCF description also includes a detailed description of the radiological conditions for each room in the facility. The radiological description is discussed in detail in Section 2.1.2, "Description/Analysis of Methods" of the DP and was based on historical records required by 10 CFR 70.25(g), HCF investigation reports, and HCF characterization. The staff finds that the radiological description in the GA DP meets the requirement in 10 CFR 70.38(g)(4)(i), (ii), and (iii).

The decommissioning/dismantlement of the HCF is scheduled to be completed in the year 2000. GA has estimated that the decommissioning will take 4 to 5 years to complete. The GA DP provides a detailed schedule (Figure 2-5, "Decommissioning Schedule") of the decommissioning of the HCF. GA has described in detail in Section 2 of the DP the technical difficulty of dismantling the facility and the use of parallel dismantlement activities to reduce radiation exposures and expedite the schedule. GA has estimated that using this dismantlement approach and cleanup techniques will result in radiation exposure of less than 0.35 person-Sv (35 person-rem).

The decommissioning of the HCF will take longer than the 24 months allowed by 10 CFR 70.38(g)(vii). The NRC staff noted the following aspects: GA's use of parallel dismantling activities to expedite the schedule, the difficulty of dismantling the HCF, the practical limitations on GA's ability to comply with the letter of the regulations on financial assurance, the benefits from using the approved alternative financial mechanism described in SECY-96-124, "Financial Assurance for GA Facilities," the staff's forbearance from instituting enforcement action to require strict compliance with the financial assurance regulations, and the fact that imposing the required completion of the HCF decommissioning within 24 months could threaten the cleanup of the HCF. Based on these aspects, the staff concludes that the delay of the completion of the decommissioning beyond the 24 months until the year 2000 is in the public's interest. Therefore, the staff approves the extended schedule proposed by the licensee in accordance with 10 CFR 70.38(i)(5).

2.2 Decommissioning Organization and Responsibilities

The decommissioning organizational structure is defined in Section 2.2 of the GA DP, "Decommissioning Organization and Responsibilities." The GA organizational structure has identified the key personnel responsible for the remediation, and clearly defined the lines of authority to the corporate level. The Project Manager (Hot Cell D&D) has overall responsibility for all remediation activities conducted for the HCF. The Health Physics (HP) Manager has responsibility for radiological health and safety regarding the decommissioning of the HCF.

The staff concludes that the GA organizational structure is acceptable because it has identified the key personnel responsible for the remediation, clearly defined the lines of authority to the corporate level, demonstrated that the organization has the technical competence to conduct the required remediation activities, and is consistent with the guidance in Regulatory Guide 3.65.

2.3 Training

GA has committed to focus the training program on the inherent risks of exposure

to radiation, and address the specific aspects of the radiological work that may be encountered at the HCF. The staff concludes that the GA's training program is acceptable and meets the requirements of the applicable provisions of 10 CFR 19.12.

2.4 Fire Safety

Because the facility is being dismantled (Section 2 of the DP provides a detailed discussion of the dismantlement of the HCF), GA plans to minimize the duration waste is stored on site by scheduling regular shipments to designated treatment, storage, or disposal facilities, the principal fire risk at the HCF arises from welding, torch-cutting, and other hot working processes to support dismantlement. The licensee proposes to administratively control such operations and post fire watches equipped with fire extinguishers. The HCF is equipped with a fire suppression system and fire alarms that are inspected monthly. These systems will cover all decommissioning work. The staff finds that the GA Fire Safety Program addresses all potential fires scenarios and is acceptable.

3.0 RADIATION PROTECTION PROGRAM

The GA radiation protection program to be used during dismantlement of the HCF incorporates the requirements of 10 CFR Part 20.1101. GA will provide appropriate caution signs and labels in accordance with 10 CFR Part 20.1901 and 20.1902. In addition, the radiation protection program will implement administrative controls to control access of all project workers entering radiologically controlled areas, and establish work zones for transition between any restricted or controlled areas and unrestricted areas. The radiation protection program also defined the radiation monitoring devices to be used by all workers (i.e., thermoluminescent dosimeters and self-reading or digital alarming dosimeters). In addition, bioassay measurements will be made as necessary to access the intake of radioactive materials, in accordance with 10 CFR 20.1204.

The radiation protection program also addresses environmental monitoring for airborne particulates. Monitoring locations will be located in or near ventilation exhaust ducts unless their purpose is to detect leakage during operations. Locations or the number of air samplers will be changed when dictated by modifications to the facility structure, change in work processes, or elimination of potential sources. GA has also committed to conduct and document any effluent discharges averaged over 1 year that exceed 20 percent of the applicable concentration in 10 CFR Part 20, Appendix B.

The primary responsibility for implementation of the radiation protection program is assigned to the GA Director, Licensing, Safety, and Nuclear Compliance (LS&NC). The Director of LS&NC will have direct communications with the GA HP Manager and the D&D Project HP Manager and will maintain overall responsibility for the radiation protection program. In addition, the administrative organization and functional responsibilities for implementation of the radiation protection program are discussed in detail in Section 3.2 of the GA DP.

GA has committed to conduct an ALARA analysis for any task where the HP determines that 5 percent of the applicable dose limits are exceeded. GA has estimated the total occupational exposure of less than 0.35 person-Sv (35 person-rem) for completing the HCF decommissioning.

The staff reviewed the GA's radiation protection program and evaluated the tasks and activities that would be required to support the dismantlement of the HCF.

The staff finds that the radiation protection program provides sufficient control of radioactive materials during dismantlement, demonstrated implementation of ALARA principles, and the occupational exposure practices are reasonable, therefore meeting the requirements of Part 20.

3.1 Radioactive Waste Disposal

GA has estimated that the volume of radioactive waste for disposal as 1,540 cubic meters (46,100 cubic feet) consisting of the structure, equipment, soil, and paving materials. In support of the decommissioning/dismantlement of the HCF, DOE has committed to remove all the waste generated from the HCF and to transport it to an approved

Federal and or commercial disposal site. The DOE commitment is confirmed on page 3 in the attachment to GA Letter No. 2497 dated November 11, 1995 (Ltr. to G. Bramblett, GA Project Manager from R. Cummings, DOE).

GA handling, storage, and disposal of the radioactive waste will be in accordance with the requirements of 10 CFR Part 61, 10 CFR Part 71, and 10 CFR 20.2006.

GA is required by license condition (License Condition S-16) to release equipment, facilities, or packages to the unrestricted area are in accordance with "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993. These release criteria are appropriate for unrestricted release, and consistent with existing criteria.

The staff finds GA estimates of the volumes of waste generated during decommissioning, as well as the waste classification, and the practices and methods for meeting transportation requirements and to remove/dispose of the radioactive waste are reasonable and consistent with the with the requirements of 10 CFR Parts 20, 61, 70, and 71.

4.0 FINAL SURVEY PLAN

Chapter 4 of the DP describes the methodology and criteria that will be used in performing the final survey. It includes a definition of the residual radioactivity limits, radiation survey methods, facility release criteria, and the site release criteria. The final survey plan is based on the guidance provided in draft NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination, Draft for Comment."

The staff will review the licensee's final survey plan when submitted, and the staff approval of the licensee's final survey plan may be required before the licensee initiates the final survey.

5.0 COST ESTIMATE AND FUNDING FOR DECOMMISSIONING

The staff's review of the licensee's decommissioning cost was based on independent estimates and comparisons of activities conducted at this facility to similar activities conducted at other facilities. The staff's review included an evaluation of the cost assumptions, major decommissioning activities and tasks, dismantlement costs, volumes of waste generated, disposal costs, and transportation costs.

The staff finds that both the cost estimate for decommissioning, and the commitment by DOE and GA (DOE 76%, GA 24%) to fund the cost of the decommissioning are reasonable. The DOE commitment to fund 76% is confirmed on page 4 in the attachment to GA Letter No. 2497 dated November 11, 1995 (Ltr. to G. Bramblett, GA Project Manager from R. Cummings, DOE). GA is meeting their 24% obligation by providing a parent company guarantee of \$4.086 million and establishing an external sinking fund (Annex B of GA's May 20, 1996 letter) for the San Diego facilities. The NRC approved the GA financial mechanism on July 5, 1996 (SECY-96-124, "Financial Assurance for GA Facilities" describes the financial mechanism). The staff finds that the GA cost estimate for decommissioning is reasonable and meets the requirement of 10 CFR Part 70.38(g)(4)(v). The staff also finds that the financial mechanism is acceptable given the practical limitations on GA's ability to comply with the letter of the regulations on financial assurance, the benefits of using the approved alternative financial mechanism described in SECY-96-124, "Financial Assurance for GA Facilities," and the staff's forbearance from instituting enforcement action to require strict compliance with the financial assurance regulations so long as GA complies with the approved alternative, and until such time as GA can provide a full parent company guarantee.

6.0 PHYSICAL SECURITY PLAN

GA is not required to maintain a maintain a special nuclear material control and accounting plan because they are below the allowable special nuclear material possession limits in 10 CFR 70.51(c). Although 10 CFR 73.67 does not require a security plan, GA has committed to maintain the current physical security plan during decommissioning of the HCF.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the above discussions, the staff concludes that the GA DP for the HCF is acceptable and should be approved. The staff has reserved its prerogative to comment on the final survey plan that GA must develop before implementing the final survey; however, the staff concludes that the health and safety of workers and the public is adequately protected, the work will be completed in a reasonable time, and the funding commitment is sufficient to complete the decommissioning of the HCF.

MEMORANDUM TO: Robert C. Pierson, Chief
Licensing Branch
Division of Fuel Cycle
and Safeguards, NMSS

FROM: Michael F. Weber, Chief
Decommissioning and Regulatory
Issues Branch
Division of ~~Low-Level~~ Waste Management, NMSS
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