U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 70-734/80-05

Docket No. 70-734 License No. SNM-696 Safeguards Group 1

Licensee: General Atomic Company

P. O. Box 81608

San Diego, California 92138

Facility Name: Torrey Pines Mesa and Sorrento Valley Sites

Inspection at: San Diego, California

Inspection conducted: June 3-6, 1980

Inspectors: W. J. Cooley, Fuel Facilities Inspector — 7/1/80 Date Signed

Date Signed

Approved by: R. D. Thomas, Chief, Materials Radiological Protection Section — July 11, 1980 Date Signed

Approved By: H. E. Book, Chief, Fuel Facility and Materials Safety Branch — July 11, 1980 Date Signed

Summary:

Inspection on June 3-6, 1980 (Report No. 70-734/80-05)

Areas Inspected: Organization; Facility Changes and Modifications; Employee Training; Maintenance; Operations Review; Criticality Safety; Emergency Planning; and Radiation Protection. The inspection involves 26 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance or deviations were found in the subject areas inspected.

RV Form 219 (2)

DETAILS

1. Persons Contacted

*H. N. Wellhouser, Director, Nuclear Material Control Division
*F. O. Bold, Manager, Health Physics Services
W. R. Mowry, Licensing Administrator
*D. C. Pound, Nuclear Safety Control
H. O. Johnson, Supervisor, Hot Cell Operations
L. B. Wissler, Facilities Engineer
J. M. Keith, Lead Health Physics Technician
R. J. Cockle, Lead Health Physics Technician
M. W. Dawson, Health Physics Technician

*Denotes those attending the exit interviews.

2. Organization

The structure of the Nuclear Materials Control Division remains as described in previous inspection reports. The personnel of the Health Physics Department presently number 17 persons including one part-time consultant.

3. Facility Changes and Modifications

The licensee has installed four columns which are subcritical by diameter to receive liquids used in decontamination. A change was made to eliminate the need for Raschig rings and to permit more accurate analytical work on those liquid wastes. A similar change is planned for the handling of 13 liter, 5 inch diameter polyethylene bottles of low level liquid waste from the uranium purification process. Again, the purpose is to minimize transfers of the liquid from geometrically safe to geometrically nonsafe volumes and to improve the accuracy of analytical work.

Some changes have occurred in the location of fuel element loading stations in the Fuel Operations Department. That department was also provided with an interim storage area for fuel element shipments.

The new hot cell stack effluent sampler had been installed at the hot lab facility. Some difficulities had been encountered in the electronics of the system and it was under continuing acceptance testing.

4. Employee Training

A licensee employee training program is tailored to the needs of employees depending upon the type of work they do. Six different training sessions have been offered. Records of training are maintained in computer print-outs arranged in alphabetical order of employee name and in the personnel dosimetry and medical files of individual employees. A review of those records indicated that some form of formal indoctrination was presented to employees dating from 1962 to the present.

The six different training sessions titles appearing in the computer print-out records are Orientation, Radio (graphy), 10 CFR 19, FOD, Tech, and Sec (urity)- Rad (iation). The Orientation session has been given to all personnel working in fusion experimentation to explain the use of film badges in that effort. The radiography course was given to radiography personnel at the site but has been discontinued. The 10 CFR 19 session was designed to meet the requirements of the NRC in explaining employees' rights with respect to radiation. The FOD session (Fuel Operations Department) is presented only to those personnel who manufacture fuel in the Fuel Operations Department. The Tech session is the most comprehensive course offered and is applied to employees who use highly radioactive materials such as laboratory and hot cell facility workers. The Security-Radiation session is applied to security personnel who need a working knowledge of radiation hazards but who do not work with the material.

The training sessions are similar in that the Tech course includes most of the material given in the other five types of sessions. The various sessions differ in course content, only. Tests with a required passing grade are given in the Radiography course (discontinued), FOD session, Tech session, and Security-Radiation session. Records of attendance are maintained for all sessions. A signoff statement is required after the 10 CFR 19 session indicating that the employee understood the course content. The various training sessions range from 1 hour to 14 hours of class work.

This inspection included a review of classroom rosters for the period January through April 11, 1980. They indicated that 41 individuals had taken the Tech Course over that period of time and that all had passed the required test. Additionally, three individuals had taken the Security-Radiation Course on April 29, 1980 and passed their required tests.

A review was made of the medical files of three individuals selected from the master computer print-out record of employees who had been trained. Those three were selected on the basis of tests results (one just passing at 70%, one with test results intermediate between 70% and 100%, and one with a 100% test result). The medical files were complete including a copy of the test as graded, along with indications that a critique has been held with the employee after the test to review any questions which had been missed. That review was of individuals taking the Tech Course. Course outlines are available for the 10 CFR 19, FOD, Tech, and Security-Radiation sessions. Tests associated with the various sessions are comprehensive. The Tech Course examination consists of about 86 questions valued at a total of 100 points.

The licensee has no formal retraining program although retraining of employees is conducted on an as required basis. Additional health physics indoctrination is furnished by health physics technicians in their daily contract with employees.

5. Preventive Maintenance

This inspection included a review of the licensee's activities with regard to maintenance of radiation detection instruments, emergency vehicle equipment, criticality alarm checks, and emergency generators. The licensee maintains records of the above maintenance checks as well as the equipment repairs.

The licensee has devised a monthly computer print-out of all health physics type instrumentation in use at Torrey Pines Mesa and Sorrento Valley. That print-out indicates the instrument identification, its general location, specific location, last calibration date, calibration due date, calibration frequency, and a space for comments. That list includes all portable instrumentation, test equipment, stack monitoring equipment, and electronic standards. Calibration frequencies vary from monthly to annually and required calibrations are picked up on the monthly print-out. If instrumentation requires repairs and/or new batteries, they are furnished at the time of the required calibration. The licensee maintains his own laboratory for repairs and calibration of instrumentation. Required actions on instrumentation indicated on the monthly print-out are transmitted to health physics technicians in the field. Those technicians retrieve the instruments and deliver them to the calibration laboratory.

The licensee's emergency vehicle is checked once each two weeks for its inventory of decontamination equipment, reentry equipment, instrumentation, records and dosimetry equipment, tool kit contents, and miscellaneous items. The vehicle fuel level, oil level and water level are checked at that time. Records are maintained of those checks. At the same time the emergency vehicle is checked for equipment inventory and operability it is used to transport health physics technicians on the criticality alarm check at the Torrey Pines Mesa and Sorrento Valley facilities. The criticality alarm check includes monitoring twelve possible modes of failure. A record is maintained of the date of criticality alarm check and of the person who made the check. The check off list used for criticality alarm operation includes a listing of all alarm units which are currently in operation at the two facilities. Space on the alarm check list record permits identification of any particular alarm which has failed by failure code (identification of the failure mode by a number 1 through 12). This inspection included a review of records of emergency vehicle checks and criticality alarm checks for June 2, 1980.

The licensee maintains two 10 kilowatt gasoline powered emergency generators to supply power for lighting, air sample acquisition and other emergency needs. Those generators are mounted on two wheeled trailers and are parked under cover along with the emergency vehicle and fire truck. Those generators are checked monthly by the environmental specialist and records are maintain by that person in a hardbound log book. The monthly checks include oil level, startup, a record of run time, and a record of any tuneups required.

An additional electrical power supply is available from the emergency vehicle in that the vehicle is equipped with a three and one-half ampere alternator.

6. Operations Review:

This inspection included a visit to the hot cell facility to inspect the new stack monitor installation. It also included a visit to the Fuel Operations Department in Sorrento Valley in response to an emergency at that location on June 6, 1980.

The licensee has prepared a draft Health Physics Department Procedure entitled "Operation of the Hot Cells Stack Monitor". That procedure explains the methods of retrieving information from the system, checking the operation of the system, procedures for recording daily readings by health physics technicians, methods for setting audio-visual alarm set points, methods for check source tests of the system, and an explanation of abnormal operations/alarm conditions, and examples of effluent records to be maintained by health physics technicians. With this operation procedure in hand the inspector visited the hot cell gallery and tested the various channels for information content, alarm settings, and source check test. It was found that the stack monitor system was undergoing a continuing acceptance test because some difficulities had been found in the electronics of the sytems. The stack monitoring system being replaced was in operation and the stack effluents were being measured at the time of this inspection.

The emergency response visit to the Sorrento Valley Fuel Operations Department is presented below in Section 7, Emergency Planning.

7. Emergency Planning:

At approximately 9:05 AM on June 6, 1980 an emergency was declared in the Fuel Operations Department. Notification of that emergency to the Emergency Coordinator's office was by radio communication. An additional telephone call was made by the Coordinator to obtain details of the emergency.

The difficulty was that a bus bar connection has shorted out at a local circuit breaker connection. The circuit breaker was not damaged but was bypassed by the event causing a second circuit breaker upstream to actuate. Loss of power was experienced to one of two plenum exhaust systems and to the health physics air sample vacuum pumps at the Fuel Operations Department. The event was signaled as an exhaust system failure to the local security guard post and was also observed locally by the cessation of background noise from the exhaust system. Operating personnel in the Fuel Operations Department were secured to the lunch room in that facility pending repairs to the system.

Although the situation had been reported as under control, the emergency coordinator accompanied by the NRC inspector responded by emergency vehicle to the Fuel Operations Department by 9:15 AM. It was observed that representatives of the licensee's Fire Department, Industrial Safety, Security, and Crafts had already responded. Repairs had been started on the bus bar at that time. Repairs consisted of removing a section of the bus bar and replacing it with heavy duty cables. Those repairs had been completed by approximately 1:30 PM on June 6, 1980.

By letter dated April 11, 1980 the NRC requested additional information from the subject licensee with respect to his emergency plan. That request included a listing of both onsite and offsite emergency supplies and equipment and the provisions for performing maintenance, surveillance testing and inventory of that equipment. That subject has been addressed during this inspection as reported in section 5 above. Additional information requested in that letter included copies of agency agreement letters with offsite emergency response supporting agencies; plots of calulated time-distance-dose for the design basis accident; listing by title of written procedures that implement the emergency plan; a map of the site showing the exclusion area; and a listing of available emergency kits, protective equipment and supplies maintained for emergency purposes. At the time of this inspection the licensee was preparing a response to that request for additional information.

An example of a emergency drill conducted by the licensee and examples of his coordination with outside support groups was given an NRC report No. 70-734/78-10, Section 6, dated December 5, 1978.

A special emergency drill was conducted by the licensee in cooperation with Scripps Memorial Institute Hospital in 1979. Scripps Hospital is regarded by the licensee as his primary contact for radiation injuries. That hospital is located approximately one minute running time from the licensee's facility.

Approximately nine hospitals in the San Diego Area desired to be accredited as primary, emergency area facilities. One of the criteria for that accreditation is the requirement that the hospital must be able to handle radiation accident victims. The licensee, in cooperation with the California Office of Disaster Preparedness, helped those hospitals to set up a program for radiation accident qualification. That aid included the determination of hospital areas to be used under the circumstances, recommendation of equipment to be obtained, and the exercise of those special drills. Among the hospitals so qualified was Mission Bay Hospital located approximately five miles south of the licensee's site. A licensee representative stated that the Mission Bay Hospital could be used as alternate to Scripps Hospital in an event of an emergency. The value of a alternate hospital lies in its nearness and its accessibility even in the event that freeway (Interstate 5) overpasses were lost in an earthquake. Scripps Hospital might be inaccessible with loss of overpasses.

A licensee's emergency comunication system includes both FM radio and telephone. The licensee maintains radio contact with the local police. The emergency van is equipped with radio capable of contacting the licensee's facilities and relaying that contact to the police. The emergency van also contains radio communication to "Station X" (San Diego County Emergency Services) which permits the van direct communication with available hospitals.

The emergency van is also equipped radio communication with the County Office of Disaster Preparedness and the County Sheriff. The local fire department is located within a five minute run of the licensee's facility. Representatives of that fire department have visited the licensee's site to become generally familiar with hydrant and building locations.

On March 27, 1980 a radiation accident victim drill was held by the licensee with Mission Bay Hospital in cooperation with the County Office of Disaster Preparedness. A critique of that drill was held with the licensee, the hospital authorities, and the Office of Disaster Preparedness participating.

As in the case of the drill held in cooperation with Scripps Hospital the drill at Mission Bay Hospital was provided with as much realism as possible. Moulages were used to simulate injuries to two individuals. Those injuries included severe head injury and forehead lacerations and a compound fracture of the left femur. The second victim indicated open fracture of the left leg and severe laceration of the right forearm. Camping lantern mantles were taped to the inside of the victims' coveralls and placed under the moulages. Powder which fluoresces under ultraviolet light was used to simulate radioactive contamination. General Atomic Company Health Physics Technicians accompanied the "victims", primarily in their role as instructors. The hospital radiation monitoring team assessed the contamination levels using radiation survey equipment supplied by the Office of Disaster Preparedness.

Records were maintained of the personnel participating in the exercise as well as those attending the radiation disaster drill critique which followed. Minutes of the critique meeting were maintained by the hospital. Recommendations for improvements were recorded along with the chronology of the drill.

Notwithstanding the cooperation and coordination with outside support groups, the licensee has no formal agreements with local hospitals, police, or fire departments.

This inspection included a review of criticality drills conducted by the licensee. Evacuation drills of that nature were conducted at the Sorrento Valley, Building A, on October 3-4, 1979 and May 1-2, 1980. Evacuation exercises on those occasions were conducted for each of the three shifts. Evacuations drills were conducted at the Triga Fuel Fabrication building on December 20, 1979 and February 26, 1980. Critiques of those and similar evacuation drills are not conducted routinely after the drill. Licensee representatives stated that if any difficulties are encountered during drills, the people involved are informed.

8. Criticality Safety:

In NRC Report No. 70-734/79-03, Section 6, dated April 27, 1979. The licensee's efforts in recalculating the interaction of fissile accumulations was reviewed. Since that inspection the licensee has completed all interaction calculations in the Sorrento Valley Building A (now building 37). Those calculations were performed with the licensee's SOLNEW code. A portion of the data base for those calculations can be made available in a form of a plan view layout of the facility indicating the location, orientation, and identification of each interacting station. That information can be printed for any selected building elevation.

Identical calculations have been made for the Triga Fuel Fabrication building.

The relocation of certain fuel element loading stations and provision for interim storage of packaged fuel elements (mentioned in section 3 above) has been included in the most recent interaction calculations for the Fuel Operations Department.

The licensee's Criticality Control Department is presently studying the interaction code SNAKE. Comparisons are being made between SNAKE and the licensee's SOLNEW code with respect to shadowing. Comparisons are also being made between interaction calculation results by those codes and solid angle calculations without shadowing effects.

9. Radiation Protection

This inspection included a review of in plant air sample data for the 4th quarter of 1979 and the 1st quarter of 1980. The source of that information was a monthly report furnished by the Health Physics Department to the Fuel Operations Department. That monthly report is presented in tabular form indicating the areas in which air samples are obtained along with the average concentration in each area for each of three shifts. An additional table is presented in that report giving the maximum single air sample result, its location and the date on which it was obtained for each of the three shifts. For the sake of correlation a table is also presented in that report giving the average removable surface contamination levels in the various areas of the Fuel Operations Department.

The inspection review of that data indicated that the average percent of maximum persmissible concentration (MPC) at the Fuel Operation Department was being maintained at less than 10%. The maximum single air sample was greater than 10 times MPC for the 4th quarter of 1979 but less than 10 times MPC for the 1st quarter of 1980. The maximum single air samples experienced in each of the first three quarters of 1979 were less then 10 times MPC.

The licensee's bioassay program includes two in vivo counts per year and four urinalysis bioassay samples per year for uranium-235. During this inspection the results of the last two in vivo counts were reviewed. A count obtain during October 4-12, 1979 indicated 16 positive results of 114 persons counted. The maximum result for a individual was 83 $\pm$ 43 ug U-235. An in vivo count obtain during April 24-29, 1980 indicated 18 positive results of 62 employees counted. The maximum result was 69 $\pm$ 42 ugm U-235. Urine bioassay analysis results were not reviewed as part of this inspection.

10. Management Interview

The scope and the results of this inspection were discussed with licensee management on June 6, 1980. Those persons were informed that no items of noncompliance with NRC requirements were observed within the scope of the inspection.