

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 04008830/85001(DRSS)

Docket No. 040-08830

License No. SUB-1430

Licensee: Honeywell, Inc.
Defense System Division
600 Second Street
Hopkins, MN 55343

Facility Name: Joliet Army Ammunition Plant

Inspection At: Joliet, IL

Inspection Conducted: August 1, 1985

Inspector: *D. R. Gibbons*
D. R. Gibbons
Radiation Specialist

8-16-85
Date

Approved By: *D. G. Wiedeman*
D. G. Wiedeman, Chief
Nuclear Materials Safety Section 1

8-16-85
Date

Inspection Summary

Inspection on August 1, 1985 (Report No. 04008830/85001(DRSS))

Areas Inspected: Unannounced, safety inspection of activities under License No. SUB-1430 including organization; licensee audits; training, retraining, and instruction to workers; radiological protection procedures; materials, facilities, and equipment; receipt and transfer of material; shipping incidents; exposure controls - external, internal, and ALARA program; posting, labeling and control; surveys; radioactive effluents monitoring program; emergency preparedness program; and confirmatory measurements. The inspection involved 10 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance were identified during the inspection of the 13 areas of the licensed program.

8508230098 850819
REG3 LIC40
SUB-1430 PDR

DETAILS

Persons Contacted

- **D. Young, Assistant Radiation Safety Officer
- **J. Fitzsimmons, Environmental Engineer
 - J. Law, PVC Advisor
- *S. Smith, Senior Safety Engineer
- **J. Straddeck, III, Safety/Environmental Engineer
 - D. Geis, Team Leader, Shipping/Receiving

*Attended entrance interview.

**Attended both entrance and exit interview.

The inspector also met and discussed licensed operations with several other supervisory, professional, technical, and production workers employed by the licensee under License No. SUB-1430.

Purpose of Inspection

A review of the various aspects of the licensee's operations was conducted during this initial inspection. This included the scope of operations, health and safety aspects, operating practices, examination of the performance of personnel, review of pertinent records, a review of the waste handling and transportation, and the facilities and procedures.

The SUB-1430 license authorizes assembly, packaging, and loading of API projectiles fabricated from depleted uranium (DU) source material.

The results of this inspection indicated that the licensee is performing licensed activities in accordance with the regulations. The licensee possesses and used licensed source material in kind, form and quantity as authorized.

1. Organization

The Honeywell, Inc. Defense Systems Division (DSD) Management Control function for License No. SUB-1430 is located at the Joliet Army Ammunition Plant (JAAP), Joliet, Illinois. The licensed activities are closely monitored by Honeywell, Inc. DSD personnel out of the Minnesota office. The organization chart is presented in Attachment No. 1 of this report. The principal contacts for this license are: James Frakes, Location Manager, John Straddeck III, Safety/Environmental Engineer, David Young, Assistant Radiation Safety Officer, Joliet, Illinois, and James Fitzsimmons, Environmental Engineer at the Minnesota Office.

The DU Safety Committee consists of all management and operational personnel and they meet on a monthly basis to discuss problems and safety considerations.

No items of noncompliance were identified.

2. Licensee Audits

Audits, or surveys, by the licensee are conducted periodically as directed by the DU Safety Committee. These surveys consist of direct physical survey and wipe surveys performed by radiation safety personnel. In addition, audits of the DU program are performed by the licensee's consultants and by the U.S Army (ARRCOM and USEHA).

Area supervisors maintain a continuous overview of the operating program under this license.

No items of noncompliance were identified.

3. Training, Retraining, and Instructions to Workers

The licensee is following the training program as required by their license application. Area supervisors give continued training and retraining commensurate with the workers' job functions and changes. Special training sessions were conducted to train licensee personnel in the proper use of survey instruments and count rate meters. The sessions were conducted by personnel from the licensee's survey instrument supplier.

Special training sessions were conducted before, during and after disposal operations performed in the PVC area.

All employees in the DSD receive training in accordance with 10 CFR 19.12 and all female employees of child bearing age receive training in accordance with Regulatory Guide 8.13.

No items of noncompliance were identified.

4. Radiological Protection Procedures

The procedures as specified by the letters and applications for this license are followed as outlined. The licensee plans to upgrade these procedures as necessary to improve the program.

The licensee has specific emergency procedures for various areas and scenarios as outlined in the license back-up material.

Standard Operating Procedures (SOPs) for work with DU are also provided and followed to meet the requirements of the NRC, EPA, and the state of Illinois for using, handling, testing, and disposal of DU.

No items of noncompliance were identified.

5. Materials Facilities, and Equipment

Use of Materials

The materials under this license are possessed and used in kind, form, and quantity, as authorized. The DU program has two use categories:

loading of DU penetrators into cartridge casings, and firing DU penetrators down range for various quality assurance tests.

Facilities

The licensee's facilities are essentially as specified in the references supporting the licenses. The security systems, material storage, posting, labeling, utilities, and services are also as specified under the license.

Equipment

Air handling systems containing appropriate filters, such as screen and HEPA type filters are integral components for most of the operations including the projectile catcher in the test firing range. The licensee uses the required air sampling equipment and appropriate survey equipment to measure fixed and removable radioactive contamination.

No items of noncompliance were identified.

6. Receipt and Transfer of Material

Written procedures for the receipt of DU are available and followed in accordance with 10 CFR 20.205 and 10 CFR 71.55.

Written procedures for transfer of material are followed in accordance with 10 CFR 40.51, 40.64, and 10 CFR Part 71. Procedures for verification of package compliance with NRC, DOT, and State regulations are also utilized by the licensee.

The licensee maintains a current inventory of DU materials which is updated on a monthly frequency. The inventory is closely monitored by personnel at the Minnesota office.

No items of noncompliance were identified.

7. Exposure Controls - External

The licensee's personnel radiation monitoring program is as described in the references supporting the source material license application.

The highest external exposures received by personnel working with material under this license has been 50 mrem for one month and 150 mrem for one quarter.

Film badges are used to monitor the radiation dosage received by individuals who work more than three hours per week in one area where depleted uranium is present.

No items of noncompliance were identified.

8. Exposure Controls - Internal

The licensee employs both periodic and continuous air monitoring in DU dust producing areas. Air samples are collected on vacuum operated filter systems that are calibrated for air flow at least every six months.

Air samples are collected in specific areas during dust producing operations. In DU dust producing operations, individuals are monitored with low volume portable personnel air samplers. These units are used to collect samples in the breathing zone by fastening the filter holder and filter to the individual's collar. A time weighted average of the amount of uranium per unit volume is calculated.

The licensee does not have NRC approval for a respirator program as part of their license. However, individuals do wear respirators when performing tasks which create significant amounts of DU dust and particulates or when working in areas of high DU dust and particulate airborne concentrations.

The licensee performs routine wipe or smear tests to determine the levels of loose contamination which may lead to airborne concentrations. These wipe tests are obtained at least monthly and occasionally weekly. The established threshold action limit for these wipe samples is 400 $\mu\text{g U}/100\text{ cm}^2$ as determined by alpha counting.

Urinalyses are performed monthly on workers based upon their job category and/or the occurrence of an incident involving the release of DU to the air. In addition, an increase in the air sampling results in excess of the threshold limits, suspected ingestion or inhalation of DU dust, or when a routine urinalysis result is positive and exhibits an increase over previous results, additional urinalyses will be performed. The threshold action limit for DU in urine is 25 $\mu\text{g}/\text{liter}$. If an individual exceeds 50 $\mu\text{g}/\text{liter}$ of U in the urine sample, they are assigned to duties not involving exposure to DU.

The NRC inspector's review of bioassay records indicate that the average bioassay urinalysis results usually range between 1 and 15 $\mu\text{g U}/\text{liter}$ in urine. The licensee appears to be operating in accordance with 10 CFR 20.103.

No items of noncompliance were identified.

9. Exposure Controls - ALARA Program

The licensee does not have a formal ALARA program; however, they do address and follow ALARA concepts and principles in their operations and in engineering designs. ALARA is a continuous goal for the licensee and the concepts have been explained to the workers in their training sessions.

No items of noncompliance were identified.

10. Posting, Labeling and Control

The licensee is operating in accordance with 10 CFR 20.203 and has posted areas properly, labeled items as required and is adequately controlling access to restricted areas.

No items of noncompliance were identified.

11. Surveys

Under the DU program the licensee is performing surveys of materials received and shipped, direct reading radiation surveys of work and storage areas, and removable radioactive contamination surveys of surfaces in work areas of the facilities. Surveys appear to be performed in accordance with NRC regulations and the conditions of the license.

No items of noncompliance were identified.

12. Radioactive Effluents and Waste Disposal

Liquid Effluents

The licensee releases no radioactivity directly to the sanitary sewer system. All aqueous liquids containing DU contamination are collected in holding tanks. The effluents are filtered, sampled, and analyzed for DU prior to release to the sanitary sewer.

Liquid waste is generated by the waste disposal operations as described in the referenced license material. As of the date of the inspection no liquid waste has been disposed or released. The licensee has collected some liquid generated during two disposal operations completed in the PVC area. That liquid will not be disposed of until results of water samples are received from the licensee's consultant.

Gaseous and/or Particulate Effluents

Gaseous and/or particulate releases to the environment from the licensee's exhaust stacks are continuously monitored during dust producing operations. The average release concentration of DU ranges between less than .02 - 4.9 $\mu\text{g}/\text{m}^3$ for a given sample, obtained continuously only during test firing sequences several times each week.

Waste Disposal

DU waste chips and powder, generated only as a product of test firing, are properly packaged, marked, classified and transported to the Richland, Washington burial site through a licensed broker. On November 26, 1984, the licensee transferred 207 drums on 4 trucks to the Richland, Washington disposal site. The drums contained a total of 20,247 mCi of depleted uranium. Each drum was wipe tested and surveyed, and found to be within the prescribed limits of removable alpha contamination. The drums ranged from 0.4 mR/hr to 6.5 mR/hr gamma, at the drum surface. The licensee has just completed filling approximately 200 drums with sand and

DU waste collected from the PVC area. The NRC inspector surveyed some of the drums, and recorded readings from 0.1 mR/hr to a maximum of 2.5 mR/hr with an Eberline Model E-120 open end window survey instrument last calibrated on May 2, 1985. The 200 drums will be wipe tested, surveyed, marked and transported by the licensee's broker, that will be accomplished by August 9, 1985.

DU in the form of projectiles that are rejects, are packaged and returned to the supplier for reuse. Monthly inventories indicate that few projectiles are rejected.

No items of noncompliance were identified.

13. Notifications and Reports

In accordance with 10 CFR 40.64, the licensee submitted a statement of source material transactions and inventory (From NRC-741) to the NRC as requested prior to February 1984. In cases of suspected theft, diversions, or loss of source material and/or other incidents, the licensee stated that they will notify the NRC as required. Radiation workers are also notified of their exposures as requested or as required.

No items of noncompliance were identified.

14. Quality Assurance

The licensee maintains a quality assurance program to verify that assembled DU rounds meet the requirements and specifications for the DOD. A sampling of the finished projectile rounds are transferred to the 75 meter DU range where they are test fired for accuracy and penetration effects.

No items of noncompliance were identified.

15. Environmental Monitoring Program

The licensee performs environmental monitoring by sampling stack effluents as discussed in the preceding Section No. 12.

No items of noncompliance were identified.

16. Emergency Preparedness Program

The licensee has prepared standard operating procedures for emergencies and decontamination operations. These procedures are presented in the letter dated August 19, 1983, referenced in License Condition No. 14 of License No. SUB-1430.

17. Confirmatory Measurements

During the inspection, direct reading survey measurements were made using an Eberline E-120 survey meter, No. NRC005261, equipped with an end window GM detector and calibrated May 2, 1985.

At the group 5 building where the assembly of the DU penetrator and the cartridge casing takes place, the general background radiation level was less than .05 mR/hr. At the surface of some stored DU rounds, readings from 3 to 4 mR/hr were observed.

The warehouse building 62-16, where DU slugs are received and stored measured a maximum of 0.3 mR/hr at the outer surface of the building.

The 75 meter DU range, gun room, and control room were well within background levels.

An alpha survey was performed of various areas during the inspection using an Eberline Model PRM-5-3 with an AC-3 probe. All of the areas indicated no alpha contamination, except near the catcher unit at the end of the 75 meter testing tunnel in the PVC area. That area is considered a contamination area and requires anti-contamination clothing. From 100 to 400 CPM alpha was detected in that area.

No items of noncompliance were identified.

18. Exit Interview

The exit interview was held on August 1, 1985 at the Joliet Army Ammunition Plant, Honeywell Inc. facility. The individuals in attendance are indicated in the Persons Contacted section of this report.

The inspector reviewed the inspection findings and explained the NRC's inspection and enforcement policies.

Attachment: Honeywell, Inc.
DSD Management Organization