U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 70-398/85-02

Docket No. 70-398

License No. SNM-362 Priority 1 Category UHRD

Licensee: U.S. Department of Commerce
National Bureau of Standards
Gaithersburg, Maryland 20899

Facility Name: National Bureau of Standards

Inspection At: Gaithersburg, Maryland 20899

Inspection Conducted: September 10-13, 1985

Inspector: J. Roth 12/2/85
J. Roth, Project Engineer date

Approved by: R. R. Keimig 12-9-85
R. R. Keimig, Chief, Safeguards Section, Nuclear Materials Safety and Safeguards Branch, DRSS date

Inspection Summary: Inspection on September 10-13, 1985 (Inspection Report No. 70-398/85-02).

Areas Inspected: Routine, unannounced inspection by a region-based inspector (36 hours) of: criticality safety, operations review, Radiation Safety Committee activities, facility changes and modifications, radiation safety, transportation, nonroutine events, 10 CFR Part 19, and licensee action on previously identified enforcement items.

Results: No violations were observed.

DETAILS

1. Persons Contacted

L. E. Pevey, Chief, Occupational Health and Safety
T. G. Hobbs, Chief, Health Physics
L. A. Slaback Jr., Accelerator and Laboratory Supervisory Health Physicist
J. Wang, Reactor Supervisory Health Physicist
C. E. Kuyatt, Director, Center for Radiation Research; Chairman, Radiation Safety Committee
E. Eisenhower, Chief, Office of Radiation Measurement; Chairman, Radiation Safety Review Subcommittee.

2. Licensee Action on Previously Identified Enforcement Items

(closed) Violation (398/85-01-01): Unauthorized receipt, possession and use of spent reactor fuel pellets. The inspector verified through discussions with the licensee and examination of licensee/NRC-NMSS correspondence that the licensee submitted a request, dated February 5, 1985, to NRC-NMSS to authorize storage of the spent reactor fuel pellets at the facility. Subsequently, authorization to store the spent reactor fuel pellets was incorporated into the facility license upon renewal of the licensee on May 27, 1985. Corrective actions have been completed.

3. Review of Operations

The inspector examined all areas of the site where special nuclear material (SNM) is handled to observe operations and activities in progress; to inspect the nuclear safety aspects of the facility; and to check the general state of cleanliness, housekeeping, and adherence to fire protection rules.

a. SNM Inventory

The inspector reviewed licensee inventory records and determined that the inventory of SNM was within the limits authorized for License No. SNM-362.

b. Housekeeping

During inspection 70-398/85-01, the inspector observed that housekeeping in the Building 245 Shipping - Receiving Area (Room B131-135 complex) was not adequate. During this inspection (70-398/85-02), the inspector observed that housekeeping in this area had improved and was adequate.

c. Laboratory Hood Air Flow Checks

During inspection 70-398/85-01, the inspector observed that laboratory hoods located in Building 245 were posted with labels which indicated that air flow velocity checks may not have been completed in a timely manner. However, licensee records indicated that the checks had been completed as required. During this inspection (70-398/85-02), the inspector observed that the licensee had removed the labels from the hoods to eliminate possible confusion over the status of operability of the hoods. The inspector reverified, through examination of licensee records, that the hood checks were being conducted as required.

d. Alpha Laboratory - Room A344, Building 222

The inspector noted that the licensee was maintaining the Alpha Laboratory in a standby mode of operation with very little work being done. One of the hoods contained liquid and solid samples of plutonium and uranium wrapped in plastic. These samples had not been touched for several years and the licensee is attempting to dispose of these materials as soon as a receiver is identified. The inspector suggested that the licensee consider a periodic survey of the inside surface of the hood to assure that, over a period of time, the packages do not leak and cause a hazard during storage or disposal.

While examining this laboratory, the inspector independently conducted a contamination smear survey of outside surfaces of the hood. The smears were taken at all possible openings on the hood. The smears were analyzed by the licensee under direct observation by the inspector. The analyses results indicated that the outside surfaces of the hood were not contaminated, i.e., less than 4 dpm/100 cm^2 alpha and less than 2 dpm/100 cm^2 beta.

4. Nuclear Criticality Safety

The inspector verified through observations that the licensee was maintaining the nuclear safety controls necessary to assure that no more than 300 grams of SNM was stored or used in any one area and that there were at least three feet separating each 300 gram batch of SNM as required by Amendment No. 6 to the facility license.

5. Radiation Safety Committee

The inspector examined licensee records of two meetings of the Radiation Safety Committee held on May 20 and August 2, 1985. Topics discussed included: the establishment of a Radiation Safety Review Subcommittee, including a Functions and Procedures Manual; a subcommittee review of the facility health physics program; plans for the establishment of a radionuclide inventory accounting system; and status of the implementation of the recently renewed License No. SNM-362.

6. Facility Changes and Modifications

The inspector determined through examination of the facilities and discussions with licensee representatives that two facility changes or modifications, within the scope of this inspection, had been initiated since the last inspection.

a. Building 245, Room B-036 Shielding Modification

The inspector examined licensee records of radiation surveys of Room B-036. Health Physics found that the radiation level outside the entry door was above 10 mrem/hour. As a result of this survey, portable shields were put in place, an interlocked barrier was installed and proper warning signs were posted. The shielding reduced the radiation level outside the door to less than 2.5 mrem/hour.

b. Building 245 Room B-141 Modification

The inspector observed, during examination of Room B-141, that the licensee was installing a 16 inch thick, high density concrete wall around a watertank which will contain Californium-252. This tank will be used as part of a new neutron source calibration facility. Calculations have been made by the licensee to assure that the radiation exposure to workers in the area conform to the ALARA concept.

7. Radiation Protection

a. Source Leak Tests

The inspector reviewed leak test records for various sealed sources maintained by the licensee from January, 1985 through August 31, 1985. It was noted that the sources were leak tested at the intervals required by licensee conditions.

The inspector noted, during review of licensee records, that the licensee had developed an inventory of sources held under its license. This inventory has been computerized and indicates which sources are in storage, which sources are below the licensed activity limit and which have to be leak tested prior to use.

b. Smear Surveys

The inspector examined weekly smear survey data for the period January through July 1985. The data indicated that corrective actions were taken when the contamination exceeded 10 dpm/100 cm^2 alpha and/or 100 dpm/100 cm^2 beta.

c. Instrument Calibration

The inspector reviewed licensee portable survey instrument calibration records for the period January 30, 1984 through June 18, 1985. The instruments had been calibrated at a maximum of six month intervals, as required by license conditions.

d. Waste Compactor Air Sampling

The inspector examined the results of air samples taken during operation of the waste compactor from November 1, 1984 to August 7, 1985. No air samples in excess of about 10% of the maximum permissible concentrations specified in 10 CFR 20, Appendix B, for unknown alpha or mixed fission product activity, were identified. The inspector noted that the licensee had standardized the decay time for these samples at 24 hours subsequent to the last inspection.

8. Transportation Activities

a. Radioactive Material Receipts

The inspector examined licensee records for the receipt of radioactive materials from January 22, 1985 to September 11, 1985. Smear and external radiation surveys were conducted to determine if the licensee was in compliance with the monitoring requirements of 10 CFR 20.205. The licensee was found in compliance.

b. Radioactive Material Shipments

The inspector reviewed licensee records for the shipment of radioactive materials from January 9, 1985 to September 10, 1985. Shipping records indicated that all shipments were labeled, marked, placarded (if necessary), monitored for radiation and contamination, and recorded as required by federal regulations.

c. Radioactive Waste Shipments

The inspector reviewed licensee records for the shipment of radioactive waste. Prior to September, 1984, the licensee used the services of Southwest Nuclear, a broker, for the disposal of radioactive waste. Subsequently, the licensee has been using the services of a new broker, Radiation Service Organization, Incorporated. During 1985, two shipments of radioactive waste were made as of this inspection. The first shipment, consisting of 32 packages, was made on March 19, 1985. The second shipment, consisting of 11 packages, was made on September 12, 1985 and was monitored by the inspector. The inspector observed that each package was properly marked and labeled in accordance with the DOT regulations, 10 CFR 61 and the burial site requirements. He also observed the packages being

loaded into the transporting vehicle, and the conduct of the vehicle radiation surveys. The inspector performed an independent radiation survey of the vehicle. The maximum radiation levels were 20 mR/hr on contact with the surface, 1.5 mR/hr at two meters from the surface, and 0.15 mR/hr in the cab of the vehicle. The inspector also examined the licensee's shipping papers and waste manifests. No inadequacies were identified.

9. Posting of Notices to Workers

The inspector observed that the notice to workers posted at the entrance to Building 245, was not modified when several of the byproduct licenses were incorporated into the SNM license upon license renewal on May 2, 1985. This was discussed with licensee representatives and the posted notice was immediately modified.

10. Nonroutine Events

The inspector determined through a review of licensee records and discussions with licensee representatives that there had been no nonroutine events at this facility, within the scope of this inspection, since the last inspection.

11. Exit Interview

The inspector met with licensee representatives identified in paragraph 1 at the conclusion of the inspection on September 13, 1985. The inspector summarized the scope and findings of the inspection.

No written information was provided to the licensee by the inspector during this inspection.