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

REGION I

Report No. 70-398/81-03

Docket No. 70-398

License No. SNM-362 Priority 1 Category UR

Licensee: U. S. Department of Commerce
National Bureau of Standards
Washington, D.C. 20234

Facility Name: National Bureau of Standards

Inspection At: Gaithersburg, Maryland

Inspection Conducted: April 20-22, 1981

Inspectors: J. Roth, Project Inspector — 6/9/81 date

_____ date

_____ date

Approved by: H. W. Crocker, Chief, Fuel Facility Projects Section, PB #2, DR&PI — 6/9/81 date

Inspection Summary: Inspection on April 20-22, 1981 (Report No. 70-398/81-03)
Areas Inspected: Routine, unannounced inspection by a region-based inspector of the licensed program including: organization,; 10 CFR Part 21; facility changes and modifications; internal review and audit; safety committees; review of operations; nuclear criticality safety; emergency planning-facilities, equipment, procedures, tests and drills; transportation program; licensee action on previously identified enforcement items; and licensee action on regional office circulars. The inspection was initiated on the day shift and involved 19 inspector hours onsite by one NRC region-based inspector.
Results: No items of noncompliance were identified.

Region I Form 12
(Rev. April 1977)

DETAILS

1. Persons Contacted

*G. W. Chamberlin, Jr., Director, Administrative and Information Services
*K. E. Bell, Deputy Director, Administrative Systems
*C. E. Kuyatt, Director, Center for Radiation Research
*L. A. Slaback, Jr., Accelerator and Laboratory Supervisory Health Physicist
*Mrs. M. H. Despain, Secretary to Director, Administrative and Information Services

*denotes those present at the exit interview.

The inspector also interviewed 17 other licensee employees during the course of this inspection. They included MBA custodians, health physics and general office personnel, and scientific staff members.

2. Licensee Action on Previously Identified Enforcement Items

(Closed) Inspector Follow Item (398/80-04-02): Review of final report of the site Radiation Safety Review Task Force when issued. The inspector verified that the Task Force Report was transmitted to NBS management on February 17, 1981. The results of the inspector's review of this report are presented in paragraph 5c.

(Closed) Deficiency (398/80-04-03): Failure to label a package of radioactive material prior to shipment as required by 49 CFR 172.403 and 10 CFR 71.5. The inspector verified that a training meeting was held with shippers on October 2, 1980 and the federal regulations with respect to the packaging, marking and labeling of fissile materials were presented and discussed. In addition, the inspector verified that an instruction memo dated October 31, 1980 had been issued to all health physics personnel. This instruction required the health physics personnel to verify all entries made on the Radioactive Materials Shippers Certification Form. Forms for shipments made between January 8, 1981 and April 20, 1981 were examined by the inspector. No problem areas with respect to shipper entries were identified. Corrective actions have been completed on this item of noncompliance.

3. Organization

The inspector determined that the current staffing of the NBS Health Physics Group is as follows:

Reporting to T. J. Hobbs, Chief, Health Physics are:

L. S. Coker, Secretary, Nuclear Materials Accountability Assistant
J. M. Arras, Reactor Supervisory Health Physicist
P. R. Cassidy, Reactor Health Physicist
J. J. Shubiak, Reactor Health Physicist
(Vacant), Reactor Health Physicist
F. Moore, Reactor Health Physics Technician
D. Hoaney, Reactor Health Physics Technician
I. Jensen, Reactor Health Physics Technician
L. A. Slaback, Jr., Accelerator and Laboratory Supervisory Health Physicist
K. H. Eggert, Accelerator and Laboratory Health Physicist
(Vacant), Accelerator and Laboratory Health Physicist
J. H. Kroll, Accelerator Safety Engineer
J. H. Terry, Accelerator and Laboratory Health Physics Technician
C. R. Tynes, Accelerator and Laboratory Health Physics Technician
(Vacant), Accelerator and Laboratory Health Physics Technician
(Vacant), Accelerator and Laboratory Health Physics Technician

Since the last inspection (70-398/80-04), the two Supervisory Health Physicist positions have been filled by Dr. J. M. Arras for the Reactor position and Mr. L. A. Slaback, Jr., for the Accelerator and Laboratory position. Dr. Arras started on November 30, 1980 and Mr. Slaback started on December 29, 1980. One Accelerator and Laboratory Health Physics Technician, Mr. G. Randel, retired effective February 19, 1981. The vacant positions will be filled as recommended in the site Radiation Safety Review Task Force Report which is discussed further in paragraph 5c.

No items of noncompliance were identified.

4. 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; to check the general state of cleanliness, housekeeping and adherence to fire protection rules; and, to review operating procedures with members of the laboratory staff.

a. SNM Inventory

The inspector reviewed licensee inventory records and as of March 31, 1981 the licensee's inventory of SNM was found to be within the limits authorized for License No. SNM-362.

No items of noncompliance were identified.

b. Standard Material Storage Vault

The inspector examined the SNM Storage Vault located in Room B118 of Building 222. All fissile material which was not contained in shipping packages was stored in the storage bins located along each side of the vault room. Source materials including natural and depleted uranium and thorium were stored in shipping containers on the floor of the vault and closed shipping packages containing quantities of Pu-238, Pu-239, Pu-240 and Pu-244 were stored down the center of the room as described in the approved license application.

The inspector noted that each wall mounted cabinet holding the criticality monitors were labeled indicating that the internal check sources had been leak tested on September 8, 1980. Since the time interval appeared to be in excess of 7 months rather than the six month interval required by the facility license, the inspector questioned licensee representatives concerning leak test intervals. Licensee records indicated that these sources had been leak tested, on September 8, 1980, December 4, 1980 and March 4, 1981, at shorter intervals than required by the facility license.

No items of noncompliance were identified.

c. Procedure Review

The inspector reviewed the safety implications and operational requirements of the following procedure with a staff member and determined that this individual had a good knowledge and understanding of the procedural requirements.

"Preparation of U-235 and Pu-239 Plated Filaments", dated January 21, 1961.

This procedure had been prepared to correspond with the license requirements specified in Amendment 1 dated January 8, 1981 which authorizes the use of up to 1 milligram of plutonium and up to 1 gram of U-235 in the mass spectrometer complex located in Building 221. The inspector also ensured that the staff member authorized to conduct this work was cognizant of the license requirements approved by Amendment 1.

No items of noncompliance were identified.

5. Nuclear Criticality Safety

a. Criticality Monitors

The SNM Vault Room B118, Building 222 is protected by four criticality monitors. These monitors are wired in such a way as to constitute two dual monitors connected in a series. Both monitors in a series must be set off to activate the horns located on each floor of the building. Examination of licensee records for the time period October 1, 1980 through April 20, 1981, indicated that the monitors had been silent tested once each week by exposing the detector to a built-in test radiation source. The criticality monitors were last calibrated on February 2, 1976. Since that time licensee records indicate that the meter readings have drifted about 10% which is not considered by the licensee to be a significant change in the calibration of the instrumentation.

No items of noncompliance were identified.

b. Criticality Alarm Checks and Evacuation Drills

The inspector verified through a review of licensee records that monthly criticality siren tests were conducted between October 8, 1980 and March 26, 1981. The licensee also set off the criticality monitors with a cobalt source to annunciate evacuation drills for Building 222 at least every six months. Drills were conducted on September 24, 1980 and March 26, 1981. Licensee records indicated that the evacuations were completed in less than 4 minutes and that the emergency evacuation alarm system functioned properly during each drill. The records also indicated that corrective actions were taken in a timely fashion whenever the alarm system was found to be improperly operating.

During alarm tests conducted on October 27, 1980, one of the criticality monitors (B-2) would not trip as required. Licensee records indicated that corrective action was taken immediately. While correcting the problem, the criticality system alarmed accidently. According to licensee representatives, Building 222 was evacuated in an orderly manner, after which it was announced that this was a false alarm and the building was cleared for reentry.

No items of noncompliance were identified.

c. Audits

During March 1980 the licensee established a "Radiation Safety Review Task Force" which conducted a comprehensive review of radiation safety practices and procedures at the site. The Task Force then made recommendations to management for revising policies which would improve on site radiation safety. The review was completed within six months. Specific recommendations were made to management concerning staffing of the Health Physics group, expanding the role of the site Radiation Safety Committee, acquisition

of Health Physics measuring and monitoring equipment, computerizing health physics records, facility construction, environmental monitoring and training. The report was transmitted to licensee management by memo dated February 17, 1981. Licensee management is currently reviewing this document. Adoption and/or implementation of the recommendations contained in the report will be followed by the inspector during subsequent inspections (81-03-01).

No items of noncompliance were identified.

6. Safety Committees

A Radiation Safety Committee has been established to advise the Deputy Director of NBS through its chairman on matters pertaining to radiation safety, including the scope, ramifications, and safety programs required for all possible existing radiation hazards generated by NBS operations or through the use of NBS equipment or facilities. The Director of the Center for Radiation Research has been designated as chairman of this committee and will coordinate the activities of this committee with the Radiation Safety Officer. Members of the Radiation Safety Committee as of this inspection include:

C. E. Kuyatt, Chairman, Director, Center for Radiation Research
T. G. Hobbs, Radiation Safety Officer, Chief, Health Physics
R. S. Caswell, Chief, Nuclear Radiation Division
R. S. Carter, Chief, Reactor Radiation Division
T. M. Raby, Deputy Chief, Reactor Radiation Division
R. R. Greenberg, Inorganic Analytical Research Division
J. N. Brewer, Chief, Plant Division
W. J. Rabbitt, Security Officer
L. E. Pevey, Chief, Occupational Health and Safety Division
M. A. Greene, M.D. Medical Officer

The inspector examined licensee records of four meetings of the Radiation Safety Committee held between April, 1980 and March, 1981. Topics discussed included: radiation safety training, review of procedures for the acquisition, storage, and distribution of Pu-244 SRMS, and, an indepth examination of the Radiation Safety Review Task Force Report discussed previously in paragraph 5c.

No items of noncompliance were identified.

7. Facility Changes and Modifications

The inspector determined through examination of the facilities and discussions with licensee representatives that no facility changes or modifications within the scope o' this inspection had been initiated since the last inspection.

No items of noncompliance were identified.

8. 10 CFR Part 21

The inspector determined that the licensee had posted the information required by 10 CFR 21.6 at applicable locations throughout the facilities. The licensee had also established applicable procedures for the review, evaluation and reporting of defects as required by 10 CFR 21.21.

9. Shipping Records

The inspector examined licensee records for the shipment of radioactive materials during the time period January 8, 1981 through April 20, 1981. The records indicated that all shipments were labeled, marked, placarded, and recorded as required by federal regulations.

No items of noncompliance were identified.

10. Licensee Action on Regional Office Circulars

The inspector determined through discussions with available licensee representatives that IE Circular 80-20, dated August 21, 1980 "Changes in Safe-Slab Tank Dimensions" had not been received and reviewed for applicability for the facilities and activities licensed under NRC License No. SNM-362. As a result, the inspector gave licensee representatives a copy of IE Circular 80-20. The licensee's review of applicability of this circular to licensed activities will be examined during a subsequent inspection.

No items of noncompliance were identified.

11. Emergency Plans and Procedures

The inspector examined the site "Facilities Self-Protection Plan-Gaithersburg Site" dated February 1979 and the emergency procedures contained in the "NBS Radiation Safety Manual" dated August 1974 with respect to the requirements specified in 10 CFR 50 Appendix E, Section IV. It was determined that the emergency plan and procedures contained no emergency criteria, action levels or limits, or discussion of transportation accidents. In addition, there was no indication that written agreements have been obtained from off-site agencies; there was no definition of emergency equipment available other than for fire; there was no discussion of the emergency training program; there was no discussion of reentry procedures and no evaluation of the potential magnitude of releases off-site.

During discussions with licensee representatives concerning emergency plans and procedures, the inspector was informed that the licensee had submitted a letter to NRC-NMSS dated March 2, 1981 which requested a waiver to the "Order to Modify License" dated February 11, 1981. The

Order to Modify License No. SNM-362 required that the licensee prepare and submit radiological contingency planning information to NRC for review. The basis of the request for waiver was "that the activities at NBS governed by SNM License No. SNM-362 (were) such that the potential for employee exposures or for offsite radiation doses...(was) negligible."

Since the Order to Modify License was issued by NRC to require the preparation of an emergency contingency plan and since the licensee requested a waiver to this requirement, the inspector informed licensee representatives at the exit interview that the inadequacies in the licensee's current emergency plan and procedures will be considered as unresolved until NRC-NMSS has determined whether an emergency plan is required for continued activities at this facility under License No. SNM-362 (81-03-02).

12. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. An unresolved item disclosed during this inspection is discussed in Paragraph 11.

13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection at 11:00 am on April 22, 1981. The inspector summarized the scope and findings of this inspection. Remarks made by licensee representatives during the exit interview have been incorporated into the applicable paragraphs of the report details.