

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

REGION 7

Report No. 40-672/81-01

Docket No. 40-672

License No. SMB-179 Priority 1 Category B

Licensee: Nuclear Metals, Incorporated

2229 Main Street

Concord, Massachusetts 01742

Facility Name: Nuclear Metals, Incorporated

Inspection at: Concord, Massachusetts

Inspection conducted: February 19, 1981

Inspector: Claude Rowe  
C. Rowe, Radiation Specialist

4/13/81  
date signed

Approved by: J. Kinneman  
J. Kinneman, Chief, Materials Radiological  
Protection Section, Technical Inspection  
Branch.

4-15/81  
date signed

Inspection Summary:

Inspection on February 19, 1981 (Report No. 40-672/81-01)

Areas Inspected: Routine, unannounced inspection of the radiation safety organization, scope of operations and utilization of licensed materials, tour of facilities, training, exposure control-external, exposure control-internal, radioactive effluents, and radioactive waste handling.

The inspection involved seven inspector-hours on site by one NRC regional based inspector.

Results: Of the eight areas inspected, no items of noncompliance were identified.

## DETAILS

### 1. Persons Contacted

- \*D. Baczkowski, Vice President, Finance
- \*A. R. Gilman, Vice President, Safety and Quality Control
- \*F. P. Cornetta, Jr., Health Physicist
- \*F. J. Vumbaco, Compliance Auditor

The inspector also interviewed several other licensee employees during the course of this inspection. They included operators, foremen, scrap handlers, safety, and shipping personnel.

\*denotes those present at the exit interview.

### 2. Organization

Mr. Gilman is the Radiation Safety Officer with a staff comprised of a Health Physicist and six technicians, Safety Officer and four technicians, and Transportation Compliance Officer and three technicians. Selections have been made for the positions of Leadman, Transportation Compliance and Training Officer with personnel scheduled to begin employment within thirty days. This action completes additions to the staff of two Health Physicists in Transportation Compliance and a Training Officer since the last inspection.

No items of noncompliance were identified.

### 3. Scope of Operation and Utilization of Licensed Material

Depleted uranium tetrafluoride (UF<sub>4</sub>) is converted to uranium metal derbies by a reduction process. The metal derbies are processed into penetrators to fill purchase orders which relate to Defense Department Contracts. This processing includes operations involving cutting, turning, extrusion, grinding and drilling.

No items of noncompliance were identified.

### 4. Tour of Facilities

The inspector toured the facilities and observed work in progress during all stages of production of the penetrators. The inspector observed that operations personnel wore company-issue clothing and safety shoes while in restricted areas and that a change area equipped with survey meter for personnel contamination surveys and wash facilities were located at the egress points. Additional protective clothing including laboratory coats, rubbers, shoe covers, gloves and dust masks were provided as required for specific work areas. Area air samplers were in operation continuously and individuals working in potential airborne radioactivity areas wore personnel

air monitors. Production personnel and supervisors were interviewed during the tour by the inspector and surveys of the employees' hands were made by the inspector. No incidents of hand contamination were identified. Individual radiation level surveys were made by the inspector and agreed with licensee measurements. The licensee representative accompanying the inspector stated that penetrators were manufactured on three shifts daily and a health physics technician toured the facility every two hours auditing for compliance with safety procedures.

No items of noncompliance were identified.

5. Training

Training for new production personnel includes a lecture on radiological procedures, emergency procedures, contamination control, use of change areas, and materials handling hazards. The personnel are instructed by their foreman/supervisor on the use of specific equipment and any special instructions relative to their assigned work areas. New employees are assigned to work directly with an experienced operator for a minimum of forty hours on-the-job training.

No items of noncompliance were identified.

6. Exposure Control - External

The licensee maintains personnel dosimetry records on equivalent NRC Form 5. The inspector reviewed the records for the period January 1, 1980 through December 31, 1980. All whole body, skin, and extremity doses were within limits specified in 10 CFR 20.101.

No items of noncompliance were identified.

7. Exposure Control - Internal

The licensee analyzes bioassay samples from personnel working in the reduction area weekly and other areas bimonthly. Action guides require an investigation at 60 ugms/liter and suspension from uranium work at 120 ugms/liter. The inspector reviewed records of the routine urinalysis data and noted several employees had exceeded the action limits. The licensee had conducted investigations and had removed one employee whose bioassay result was 127 ugms of uranium/liter, from uranium work in accordance with their action guides. The inspector reviewed records of personal air monitors for the employees and found no evidence of exposure to increased airborne radioactivity prior to collection of the urine samples for analysis.

No items of noncompliance were identified.

## 8. Radioactive Effluents

The licensee maintains records of airborne concentrations from the plant stacks. Based on licensee data it was determined that a total of 7.37 mCi had been released from the stacks in 1980. The average concentration released from the stacks for the previous 52 weeks was  $2.4 \times 10^{-12}$  uCi/ml. It was noted that this corresponds to about 50% of MPC and was an increase over 1979 release. The licensee representative stated this increase was due to an approximate 50% increase in production during 1980.

The licensee maintains records of environmental samples taken from wells around the Bog (lagoon) located in the rear of the acid house. The records of analyses of well samples indicated no detectable activity.

## 9. Radioactive Waste Handling

Liquid waste is generated by treatment of metallic uranium with acid to remove copper cladding. An inplant plumbing system directs all liquid waste to a two tank systems located in the detached acid house disposal area. The waste is treated with an excess of hydrated lime to accomplish an acid to alkaline condition prior to release to a Bog (lagoon) located in the rear of the acid house.

The inspector toured the radioactive waste storage and packaging areas with the licensee's compliance auditor. The inspector noted there were about 6,000 fifty five gallon drums of packaged radioactive waste stored in an outside fenced restricted area with many of the drums in a badly deteriorated condition. The licensee representative stated they were working to eliminate this backlog and that each drum was opened and inspected prior to shipment and placed in an overpack if rusting or split. During the month of January 1981, 49 shipments of radioactive waste were made and the licensee representative stated they expected to eliminate the backlog by June 1981. During the tour, the inspector observed radioactive waste packaging, loading of a shipment and final survey of the loaded vehicle. Individual radiation level surveys were made by the inspector and were in agreement with the licensee's measurements. One drum of waste was opened by the inspector. It contained metal chips encapsulated in concrete with a cap of plain concrete which was covered by several inches of vermiculite. No inadequacies were identified in the packaging of this container. The inspector discussed various aspects of the radioactive waste, material collection, packaging and transportation program with the licensee's representative. The inspector reviewed the licensee's waste handling and shipping procedures and training records for personnel. The licensee's representative provided for review by the inspector copies of his procedures for collection, packaging and shipment of radioactive waste.

No items of noncompliance were identified.



10. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on February 19, 1981. The inspector summarized the purpose and scope of the inspection and findings and expressed concern that additional production increases could result in radioactive effluent releases in excess of the limits specified in 10 CFR 20.106.