UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION 1
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

OCT 18 1973

Nuclear Metals, Inc.
Attention: Mr. W. B. Tuffin
President
2229 Main Street
Concord, Massachusetts 01781

Docket No. 70-82
License No. SNM-65

Gentlemen:

This refers to the inspection conducted by Mr. Kinney of this office on September 24-25, 1973 of activities authorized by AEC License No. SNM-65 and to the discussions of our findings held by Mr. Kinney with Mr. Tuffin and other members of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between your Mr. Gilman and our Mr. Kinney on October 5, 1973.

Areas examined during this inspection are described in the Regulatory Operations Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Our inspector also verified the steps you had taken to correct the violations brought to your attention in a letter dated April 30, 1973, following our last inspection. Your corrective action to avoid future violations of the criticality safety limit of not allowing SNM closer than three feet from the exclusion area boundary has not been effective. The same violation was found by our inspector during this inspection. Except for this recurring violation, we have no further questions regarding matters discussed in this letter.

During this inspection, it was found that certain of your activities appeared to be in violation of AEC requirements. The items and references to the pertinent requirements are listed in the enclosure to this letter. This letter constitutes a notice sent to you pursuant to the provisions of Section 2.201 of the AEC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within 20 days of your receipt of this notice, a written statement of explanation in reply, including: (1) corrective steps which have been or will be taken by you, and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved.

A147

OFFICE ▶	CRESS				
SURNAME ▶	KINNEY/JAA	CARLSON	O'REILLY		NELSON
DATE ▶	10-16-73	10/17			10/17/73

Form AEC-318 (Rev. 9-53) AECM 0240

As shown in Enclosure No. 1 to this letter, Item 3 is a recurrent violation. In your reply to this letter please give this matter your particular attention.

In accordance with Section 2.790 of the AEC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must include a full statement of the reasons on the basis of which it is claimed that the information is proprietary, and should be prepared so that proprietary information identified in the application is contained in a separate part of the document. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Robert T. Carlson, Chief
Facility Operations Branch

Enclosures:
1. Description of Violations
2. RO Inspection Report No. 70-82/73-03

bcc: RO Chief, FS&EB
RO:HQ
L:D/D
PDR
NSIC
RO Files
DR Central Files
State of Massachusetts

ENCLOSURE NO. 1

DESCRIPTION OF VIOLATIONS

Nuclear Metals, Inc.
2229 Main Street
Concord, Massachusetts 01781
Docket No. 70-82
License No. SNM-65

Certain activities under your license appear to be in violation of AEC requirements. These apparent violations are considered to be of Category II severity.

1. 10 CFR 70.24(a)(1), "Additional Requirements", requires in part that, "In no event may a criticality monitoring device be farther than 120 feet from special nuclear material being handled, used, or stored."

   Contrary to this requirement, special nuclear material is present in a laboratory in Building A more than 120 feet from a criticality monitoring device.

2. License Condition No. 8 incorporates the "Application for Renewal of License to Process Special Nuclear Material" dated January 1, 1969. Sections II.(c)7.(a) and IV.(e) require that criticality accident drills be conducted semi-annually for each operating and maintenance shift.

   Contrary to this requirement, an evacuation drill was not held during the period from November 1972 through September 1973.

3. License Condition No. 8 incorporates the "Application for Renewal of License to Process Special Nuclear Material" dated January 1, 1969. Sections II.(a)2. and IV.(a)3(a)v. require, in part, that special nuclear material (SNM) in an exclusion area will not approach closer than 3 feet from the physical boundaries of the exclusion area.

   Contrary to this requirement, SNM was stored closer than 3 feet to the boundary of an exclusion area in the mezzanine of Building C.

U. S. ATOMIC ENERGY COMMISSION

DIRECTORATE OF REGULATORY OPERATIONS

REGION I

RO Inspection Report No.: 70-82/73-03 Docket No.: 70-82

Licensee: Nuclear Metals, Incorporated License No.: SNM-65

2229 Main Street Priority: 1

Category: A(1)

Location: Concord, Massachusetts

Type of Licensee: Fuel Fabricator

Type of Inspection: Routine, Unannounced

Dates of Inspection: September 24-25, 1973

Dates of Previous Inspection: April 4-5, 1973

Reporting Inspector: W. W. Kinney, Fuel Facilities Inspector — 10/16/73 DATE

DATE

Accompanying Inspectors: NONE — DATE

DATE

Other Accompanying Personnel: NONE — DATE

Reviewed By: H. W. Crocker, Senior Fuel Facilities Inspector — 10/16/73 DATE

SUMMARY OF FINDINGS

Enforcement Action

A. Violation - Failure to have a criticality monitoring device within 120 feet from a laboratory where special nuclear material is being handled, used, or stored. (Discussed with A. R. Gilman by telephone on October 5, 1973.) (Details, Paragraph 5.)

B. Violation - Failure to conduct a criticality accident drill, which is supposed to be conducted every 6 months, during the period from November 1972 through September 1973. (Details, Paragraph 6.a.)

C. Violation - Failure to have special nuclear material (SNM) stored greater than 3 feet from the perimeter of an exclusion area on the mezzanine level of Building C. (Details, Paragraph 7.)

Licensee Action on Previously Identified Enforcement Items

The topics discussed below were enforcement items discussed in the Region I letter to Nuclear Metals, Inc. on April 30, 1973, and the Nuclear Metals, Inc. reply of May 23, 1973. (Details, Paragraph 4.)

a. Procedures for opening shipping containers and for closing shipping containers holding licensed material were prepared and implemented on April 4, 1973. (Details, Paragraph 4.a.)

b. Criticality Safety Limit Violation

The corrective action to avoid having special nuclear material (SNM) closer than three feet to an exclusion area boundary was not effective. Violation of the license condition was again noted by the inspector during this current inspection. (Details, Paragraphs 4.b. and 7.)

c. Fire Extinguisher Inspections

If a fire extinguisher is used and reserviced between the 6 month inspections, the licensee will record this information on the tags attached to the extinguishers and in the log. (Details, Paragraph 4.c.)

d. Guard Coverage

During Monday through Friday day shifts, the health and safety officer fulfills the requirement to have an armed guard on duty. (Details, Paragraph 4.d.)

Design Changes

Not Inspected

Unusual Occurrences

None

Other Significant Findings

A. Current Findings

None

B. Status of Previously Reported Unresolved Items

None

Management Interview

At the conclusion of the inspection, a management discussion meeting was held at 5:00 p.m. on September 25, 1973. Those present were:

Nuclear Metals, Inc.

W. B. Tuffin, President
R. A. Robie, Director of Administration and Controller
A. R. Gilman, Manager of Engineering
R. C. Franks, Health and Safety Officer

AEC

W. W. Kinney, Fuel Facilities Inspector

The scope of the inspection was presented. The enforcement items previously documented in this report were discussed. The failure to have a criticality monitoring device within 120 feet from a laboratory handling SNM was discussed with A. R. Gilman on October 5, 1973 by telephone. (Details, Paragraphs 5., 6.a., and 7.)

The lack of air sampling on the filtered exhaust air on the hood in the Butler Building was discussed. The licensee agreed to install a sampler and start measuring the radioactivity in the air exhausted to the outside atmosphere. (Details, Paragraph 9.c.)

The lack of survey instruments for use by personnel prior to eating or leaving the plant was discussed. An alpha survey meter is to be made available before the end of 1973. (Details, Paragraph 12.)

The use of "CAUTION-RADIOACTIVE MATERIAL" signs in rooms containing SNM was encouraged by the inspector. The licensee agreed to study the situation. (Details, Paragraph 13.)

DETAILS

1. Persons Contacted

A. R. Gilman, Manager of Engineering, Criticality Officer, and Radiation Safety Officer
R. C. Franks, Health and Safety Officer
P. J. Zagarella, Nuclear Control Monitor
K. R. Fenton, Maintenance Supervisor

2. Organization

Mr. A. R. Gilman is functioning as the radiation safety officer until R. C. Franks completes a health physics course at Northeastern University. Upon completion of the health physics course in the Spring of 1974, Mr. Franks will probably be assigned the radiation safety officer function.

3. Scope of Operations

Nuclear Metals, Inc. continues to manufacture the concentrically nested, aluminum clad, aluminum-uranium alloy CP-5 fuel tubes for Argonne National Laboratory. The final shipment of fuel tubes manufactured under the current contract is scheduled for November 30, 1973.

4. Licensee Action on Previously Identified Enforcement Items

The topics discussed below were enforcement items discussed in the Region I letter to Nuclear Metals, Inc. on April 30, 1973, and the Nuclear Metals, Inc. reply of May 23, 1973.

a. Procedures for Opening and Closing Shipping Containers

Procedures for opening shipping containers in which licensed material is received and for closing shipping packages in which licensed material is transported were prepared. The procedures were implemented on April 4, 1973.

b. Criticality Safety Limit Violation

Storage of special nuclear material (SNM) closer than three feet to an exclusion area boundary is apparently a frequent criticality safety limit violation. The corrective action to avoid this was for the criticality officer and the nuclear control monitor to examine the work areas for this violation as a part of their daily inspections and make any needed adjustments. This action actually does not prevent the violations from occurring. Workers apparently can place material closer than three feet to an exclusion area boundary. Then the violation exists until the situation is corrected by either the criticality officer or the nuclear control monitor. Violation of this criticality safety limit was again discovered by the inspector during this inspection.

c. Fire Extinguisher Inspections

On April 13, 1973, all of the fire extinguishers were inspected for

mechanical defects and physical location. The next 6 month inspection is scheduled for October 12, 1973. Should an extinguisher be used and reserviced between inspections, the licensee will also record this information on the tags and in the log.

d. Guard Coverage

The health and safety officer is the supervisor of the guard force and is a special officer of the Town of Concord. He is not armed but has ready access to a weapon should one be needed. During day shift on Monday through Friday the health and safety officer fulfills the requirement to have an armed guard on duty. The guard force provides the rest of the 24 hour a day 7 day a week coverage.

5. Criticality Monitor Locations

The five probes of the criticality monitor system were located as indicated in the license. The control system located in the guard center was also inspected. The monitors were set to alarm at 10 mr/hr. It was learned that special nuclear material is being handled, used, and stored in a laboratory on the second floor of Building A at a location more than 120 feet from the nearest criticality monitor probe. This is a violation of 10 CFR 70.24 (a)(1).

6. Training

a. Evacuation Drills

According to Sections II.(c)7.(a) and IV(e) of the license application dated January 1, 1969, which is part of the license conditions, evacuation drills are conducted semi-annually for each operating and maintenance shift. The last drill, a fire evacuation drill, was held in November 1972. The last criticality accident drill was held in August 1972. The licensee is in violation of license conditions in that a criticality accident drill was not held during the first half of 1973. A drill was scheduled to be performed during August; however, it was postponed and had not been performed up to the time of the inspection in late September.

b. Fire Brigade Training

The fire brigade composed of plant personnel are to have quarterly meetings and training sessions. The records showed that the training sessions to acquaint brigade members with proper emergency procedures, techniques, and equipment were held on January 5, April 10, and August 1, 1973.

c. Radiation Safety Briefings

Radiation safety briefings are held by the licensee on a

quarterly basis for all manufacturing personnel. Such meetings were held in May and August 1973. The subjects of the meetings were documented in memoranda, which the inspector reviewed.

d. New Employee Briefing

The fact that two new employees were given briefings in radiation protection and criticality control was documented in the criticality safety inspection memorandum from the criticality officer to the president dated July 26, 1973.

7. Criticality Safety Limit Violation

During this inspection, the inspector again found on the mezzanine level of Building C SNM stored closer than three feet from the rope marking the exclusion area boundary. This is a violation of Sections II. (a)2. and IV.(a)3(a)v. of the "Application for Renewal of License to Process Special Nuclear Material" dated January 1, 1969, which is incorporated in License Condition 8. Violation of this criticality safety limit is commonplace according to licensee records. Evidently the licensee has been unable to educate the operating people concerning the necessity of following a simple criticality safety limit.

8. Audits and Equipment Inspection and Tests

a. Criticality Safety Audits

The criticality officer conducts frequent inspections of the operations for criticality safety. The monthly memoranda dated from April 11 through September 10, 1973, for the March through August inspection activities were reviewed by the inspector. Of special interest was the fact that a criticality monitor gave a short false alarm on July 26. Some personnel evacuated and some did not. The fact that the alarm was quite brief was given as the reason why all personnel did not evacuate.

b. Fire Sprinkler System Checks

The sprinkler system is checked for operability each Saturday according to the licensee. Records of the tests performed are maintained by the health and safety officer. The records of tests from January 6 through September 22, 1973, were examined by the inspector.

c. Ventilation Fans and Motor Inspection

Maintenance personnel inspect exhaust fans and motors periodically to assure proper operation and maintenance. The inspector examined the records of the inspections and repairs made. The information appeared to be comprehensive. The maintenance supervisor appeared to be knowledgeable about the conditions

and needs of the ventilation system.

d. Emergency Generator Checks

Maintenance starts the emergency diesel generator on each Monday. Presently, a new power operator is being trained and he has not as yet started performing this weekly test. According to the licensee, he will start performing this check in the near future. The emergency generator functioned satisfactorily the last time normal electrical power was lost on November 12, 1972.

9. Ventilation System

a. Direction of Flow

During the inspection, the inspector verified that the direction of air flow was from the outside to the inside of Building C. The flow was quite strong when the large equipment door was open. According to the licensee and the ventilation consultant the airflow is from Buildings A and B to Building C. This was not verified by the inspector.

b. Scheduled Cleaning

The licensee does not have a schedule for cleaning ventilation ductwork to control accumulations and minimize the possibility of a duct fire as committed in the license. The licensee stated that the insides of the ductwork have been found clean whenever they have been entered for any reason. He also claimed the airflows to be good. The licensee stated that a thorough inspection of the insides of the ductwork would be performed during October 1973.

c. Butler Building Hood

The licensee has a hood in the Butler Building where the nuclear control monitor opens packages of enriched uranium and handles the uranium. The hood has an exhaust system with an absolute filter. The licensee does not sample the exhaust air from this system. The licensee agreed to install a sampler and start measuring the airborne radioactivity in this filtered exhaust air.

10. Shipping and Receiving

a. Packaging for Shipment

The inspector observed the activities of the health and safety officer involved in the shipment of some depleted uranium. Although this work was not done under License No. SNM-65, it gave an opportunity to observe this type of activity. The health and safety officer checked that the receiver had a

license to receive the material. The weighing of the material was witnessed. Radiation readings were taken at the surface of the package. Smear samples were taken of the outside surfaces. The health and safety officer also made sure the package was properly labelled.

b. Records

The records of radiation monitoring of incoming shipments and packages prepared for shipment for the period from May 1 through September 11 were examined by the inspector. The records for packages of CP-5 fuel elements prepared for shipment from May through September 11 were examined and found to be in compliance with 10 CFR 71.62.

11. Emergency Procedures

The emergency procedures currently in effect were approved in May 1971. The plan given on April 5, 1973, to have the nuclear emergency committee review and update the emergency procedures has not been implemented. The emergency call lists were last revised March 15, 1973. These appear to be up to date.

12. Evaluation and Control of Personnel Radioactive Contamination

The licensee continues to have no routine survey program to determine that employees leaving potentially contaminated areas are not contaminated with radioactive materials. The licensee plans to have an alpha frisker installed for use of personnel to perform surveys prior to eating or leaving the plant. This is to be installed before the end of 1973.

13. Caution Signs

The caution sign on the fence of the outside storage area behind Building A was faded. There was no caution sign on the southwest side of the fenced area. The inspector encouraged the use of the "CAUTION-RADIOACTIVE MATERIAL" signs in rooms in which special nuclear material was present as called for in 10 CFR 20.203(e) even though 10 CFR 20.204 exempted the requirement for sealed sources. The CP-5 fuel tubes can be considered to be a sealed source.