40-6476

See forwarding

HEADQUARTERS
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ORDNANCE
WASHINGTON 25, D. C.

IN REPLY REFER TO ORDTN

26 September 1961

U. S. Atomic Energy Commission
Division of Licensing & Regulation
Germantown, Maryland
ATTN: Mr. D. Nussbaumer

DOCKET NO. 40-6639

Informally

Dear Sir:

Reference is made to AEC letter dated, 14 June 1961.

It is requested that the Ordnance Corps Source Material License number SUB-307 be amended to permit Frankford Arsenal, Philadelphia, Pa., to possess, fabricate, use, transfer, and test spotting rounds containing depleted uranium. To date, Frankford Arsenal has received source material on an SS accountability station.

Attachments 1, 2, and 3 contain pertinent information as to the processes the source material will under-go and the measures taken to minimize danger to life or property.

There are approximately 15 employees engaged (part time) in machining, melting, and casting of uranium. Each of these employees, in addition to those listed below, are given an in-house familiarization course on the potential hazard and the procedures which must be enforced. The following is a list of the participating personnel concerned with control and accountability of source material.

Function	Name	Position	Ars. Group
SS Accountability Rep.	F. Blocke	Admin. Officer	R&D
SS Accountability Rep. (Alt.)	A. Saia	Metallurgist	"
Health Physicist (Advisor)	S. Berk	Chemist	"
SS Responsible Rep.	R. Edelman	Metallurgist	"
SS Responsible Rep.	R. Walters	Ind. Engr.	"

A/4

OKRPE
Mr. D. Nussbaumer

Safety	T. P. Atkinson	Safety Engr.	I.S. & S
Health	Dr. L. P. Devlin	Post Surgeon	Services
RD Control Officer	R. A. Patterson	Dep. Ch.	I.S. & S.

Mr. S. Berk has a B. S. in chemistry and has attended the Oak Ridge School. Mr. F. Blocks, in addition to taking the in-house course, has visited and conferred with personnel of Dow Chemical, Watertown Arsenal, and Rocky Flats, relative to health and safety practices.

For the past 2 years, this installation has been surveyed by the Albuquerque Operations Office, concerning health and safety procedures. The reports indicate, "the health protection programs are consistent with programs that have been successful at other installations". "They also conform to AEC guidelines and health procedures".

Waste material from this operation will be disposed of through Army channels by the Chemical Corps.

Sincerely,

GERALD D. BURKE
Deputy Chief
Nuclear & Spec Compts Br
R&D Division

3 Incls
1. Draft
2. Trip Rpt
3. Tech Ins

Copy Furnished:
The Surgeon General
ATTN: Lt. Col. MacMurray w/o Incl

FRANKFORD ARSENAL

RESEARCH & DEVELOPMENT GROUP

DRAFT

S.O.P. MELTING & CASTING OF DEPLETED URANIUM

1. Purpose: To establish an interim Standard Operating Procedure to assure that maximum safety and health precautions will be taken during the melting and casting of depleted uranium.

2. Scope: This directive applies to all personnel who are required to work in or visit the Uranium Melting and Casting Area, located in Bldg. 149.

3. General:

a. The supervisor in charge of these operations shall be responsible for assuring that personnel concerned have a thorough understanding and comply with the requirements of this directive.

b. Only personnel who have received a physical examination and have been approved by the Health Services Branch will be permitted to handle Uranium.

c. Visitors and maintenance personnel will require authorization from the supervisor in charge to enter the area. The visitor/maintenance personnel will sign a register, reporting time in and time out.

d. No equipment, supplies, etc., will be removed from area unless first radiologically monitored, decontaminated if required, and approved by the Health Services Branch for removal.

e. Appropriate warning signs will be posted in and around the area designated for this operation.

4. Procedure:

a. Personnel Protection

(1) Before entering Melting and Casting Area, clothing and jewelry will be removed and proper protective clothing and foot wear will be donned. Protective clothing will be exchanged for street clothing when leaving. Visitors will be provided protective garments to wear over street clothes and shoes.

(2) Laundering and/or decontamination of protective clothing will be accomplished by facilities provided within the Arsenal or by an approved outside contracted source.

(3) Personnel will not smoke, eat, or drink while in the melting and casting area. Food, tobacco or drinking liquids will not be brought into or stored in the area.

(4) Air samples shall be taken to insure that the allowable level of contamination is not exceeded. These tests will be performed by the Health Services Branch. Test shall be performed daily until experience dictates less frequent sampling is indicated.

(5) All persons working in the Uranium Melting and Casting Area must submit urine samples at routine intervals for the determination of the uranium concentration in the urine. The first sample will be taken after the first week of work; the second sample will be taken three (3) months thereafter and at six (6) months' intervals, henceforth unless air samples indicate a need for more frequent bioassays.

(6) All assigned personnel will place film badge on outer clothing before entering the area. On the last work day of each month exposed film will be exchanged for new film at the Health Services Branch. A record of your exposure time must accompany this exchange.

(7) All assigned personnel and visitors are required to wash their hands prior to leaving the fabrication area.

b. Melting & Casting.

(1) At least two (2) employees must be present at all times during the operation of the furnace.

(2) After loading the furnace, checks will be made for vacuum leaks and correct water flow. No power will be applied until such checks are made and verified.

(3) The furnace will not be opened until time has elapsed so that the metal is sufficiently cool to handle with ordinary gloves. The time will vary according to the amount of metal charged. In addition, a survey will be made with a probe to determine the amount of radioactivity inside the chamber.

(4) An exhaust hood placed over the door will be required before opening the furnace so as to remove any dust particles which may be ejected from the furnace.

(5) All mold breakouts and crucible repairs will take place in a designated area equipped with an exhaust system. During this operation, the employee/s will wear a respirator, gloves and an apron provided specifically for the job.

(6) Scrap metal, used refractory mold material, and other waste will be segregated from each other in container provided same.

c. Fire Protection:

(1) Employees will be instructed by the Fire Protection Section, on materials and methods for controlling small fires.

(2) In case of fire, beyond the control of the operator, building will be evacuated immediately and the Fire Protection Section notified.

(3) Personnel required to enter the building to fight the fire will wear approved respiratory protection and will only use approved fire-fighting equipment and methods.

(4) The Fire Protection Branch will be notified immediately of all incidents involving fire even though the fire has been extinguished by shop personnel.

5. Referral: Questions concerning this procedure will be directed to Mr. Ralph Edelman, Ext. 6225, Bldg. 149.

6. Effective Date: Upon Issuance

A. L. JAMIESON
Deputy Chief,
Research Division

5. Air samples have been obtained during process operations and no significant air contamination has been detected to date.

6. Radiation dose rates are measured for each operation where personnel exposure may be significant and time limits are set if needed for exposure control.

7. Film badges are worn by all personnel who may be exposed to ionizing radiation and permanent records of all personnel exposure are maintained.

8. Internal exposures are established by urinalyses. Determinations are made as deemed necessary, depending on the type of work being performed and the potential exposure of the individual.

9. Surface contamination on floors, work benches, tools, machines, etc., is determined by direct survey with radiation detection instruments, and by smear techniques. Clean up of contaminated surfaces is accomplished by vacuuming, water washing, or scrubbing with water and and detergent.

10. All contaminated waste is placed in metal drums and properly identified. At the present time, arrangements for final disposition of this contaminated waste, including uranium chips and turnings have not been completed. These arrangements should be completed in the very near future. It has been proposed that all contaminated waste beshipped to the Army Chemical Center, Edgewood Arsenal, for final disposition.

It was indicated that future health protection measures will conform in general to those now in effect. However, as experience is gained and new information is made available, appropriate changes in some of the above control measures may be made. The extent of work being performed and type of processing operations under way at the time, may also modify to some extent the health protection requirements.

<u>Conclusion</u>

The health protection measures as indicated above are consistent with programs that have been successful at other installations. They also conform to AEC guidelines and health protection procedures.

C O P Y

TRIP REPORT
INDUSTRIAL HEALTH SURVEY OF
FRANKFORD ARSENAL, PHILADELPHIA, PENNSYLVANIA
BY CLAUDE E. DAVIS

On October 12, 1960, the writer visited the Frankford Arsenal for the purpose of conducting an industrial health survey of that part of the operation involving radioactive materials charged to the SS Accountability Station.

Contacts

Those persons contacted included:

John Foderaro, M.D., Assistant Medical Officer
A. A. Hater, Industrial Hygienist
John J. Fearn, Foreman 8531 Section

Findings

Operations involving radioactive materials charged tothe SS Accountability Station currently consist of experimental machining of depleted uranium alloy on 2 turret lathes. The machined parts are heat treated, weighed, inspected, and tested. A significant increase in the work load is anticipated in the near future and preparations are being made for a substantial expansion of processing facilities.

The area where operations are now located, and the area being made ready for future operations were visited. The following health protection measures were observed:

1. Work with radioactive material is performed in a designated area, marked as a radiation zone and only people with business in the area are allowed to enter.

2. Protective clothing, consisting of coveralls, caps, gloves, and shoe covers, are furnished as needed to employees who are engaged in work that could result in personal clothing contamination or personnel contamination.

3. Monitoring equipment is available for making personnel surveys and checks of the area, equipment, and material in radiation zones.

4. Each turret lathe is equipped with local exhaust ventilation and exhaust air is filtered before discharge.

(continued)

BRANCH OF DAKOTA
DOCKET NO. 40-6476
FOREIGN-DOMESTIC RADIOLOGICAL GROUP

FORM TECHNICAL INSTRUCTION
NUMBER 710-5-60

25 April 1960

S.O.P. MACHINING OF DEPLETED URANIUM, Bldg. 150

1. Purpose: To establish an interim Standard Operating Procedure to assure that maximum Safety and Health precautions will be taken during the machining of Depleted Uranium in Bldg. 150. ~~This procedure will be revised if necessary upon the permanent installation of a partition at the south end of the work room, adequate ventilation and exhaust system, and proper washing facilities.~~ **Installation Completed**

2. Scope: This directive applies to all personnel who are required to work in or visit the Uranium Machining Area located in Bldg. 150 including maintenance personnel.

3. General:

a. The supervisor in charge of these operations shall be responsible for assuring that personnel concerned have a thorough understanding of andcomply with the requirements of this directive.

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SEP 29 1961
Licensing & Safety Division Officer

b. Only personnel who have been examined and cleared by the Health Services Branch will be permitted to handle Uranium.

c. All persons working in the Uranium Machining area must submit urine samples at routine intervals for the determination of the uranium concentration in the urine. The first samples will be taken after the first week of work; the second will be taken three months thereafter and at 6 months' intervals henceforth unless air samples indicate the need for more frequent bioassays. The samples will be taken after personnel have completed work for the day and have changed their clothing.

d. Smoking, eating and drinking is prohibited in these areas. No food (including candy, coughdrops, drugs, beverages) will be brought into the area where the uranium is stored, machined or otherwise handled.

e. Machines, tools, measuring instruments, fixtures, supplies, etc. will not be removed from area unless first radiologically monitored, decontaminated if required, and approved by the Health Services Branch for removal.

f. Appropriate warning signs will be posted in and around the area designated for this operation.

4. Procedure:

a. Change area:

(1) Before entering machining area, clothing, jewelry and watches will be removed and proper protective clothing and foot covering put on in the change area provided. Protective clothing will be exchanged for street clothing when leaving.

(2) Protective clothing will not be removed from this area except for cleaning or disposal. Approved containers will be provided for this purpose.

(3) All assigned personnel will wear film badge on outer clothing before entering the area and the film badge will be placed in rack provided when leaving area.

(4) All personnel are required to wash their hands prior to leaving the uranium fabrication area.

b. Machining Area:

(1) Cleanliness

(a) All machining operations will be conducted in a very clean shop.

(b) Chip accumulation will be kept to a minimum at machine areas. The area will be vacuumed periodically as required by workload. All chips, scraps and dust particles will be placed in covered metal containers marked and provided for this purpose.

(2) Interim ventilating and filtering equipment will be operating during machining operations. Air sample taken shall assure that limits on contamination are not exceeded. These tests shall be performed by the Health Services Branch. Test shall be performed daily until experience dictates less frequent sampling is indicated.

(3) Machining will be done at minimum practical speed with sharp tools and with generous use of an adequate coolant. Do not allow tools to remain in contact with work any longer than necessary. Gloves shall be worn when handling raw stock. Extra precautionary measures will be observed during machining because of hazard of long sleeves of protective clothing.

(4) Decontamination of area and machines will be performed when allowable contamination levels are aproaching themaximum as determined by monitoring instrument survey.

(5) Personnel sustaining any cuts or injuries will report immediately to Post Dispensary.

(6) Finished machined items shall be inspected in the area and placed in a covered metal container a d properly identified while awaiting pickup.

(7) Fires

(a) The machine operators will be instructed by Fire Protection Section on materials and methods for controlling small fires such as hot chips and sparks.

(b) In case of fire, beyond the control of the machine operator, area will be evacuated immediately and the Fire Protection Section will be notified.

(c) The Fire Protection Section, Ext. 4129, will be notified immediately of all incidents involving fire even though the fire has been extinguished by shop personnel.

(d) Personnel required to enter the area to fight the fire will wear approved respiratory protection and will only use approved fire-fighting equipment and methods.

(8) Area will be inspected periodically by the Health Service and Safety Branches to insure that hygienic and safe practices are maintained.

c. Visitors and Maintenance Personnel:

(1) Will contact supervisor in charge to register "IN and OUT" of this area.

(2) Will be required to read and comply with this SOP.

5. Referral:

Questions concerning this procedure will be directed to Mr. Robert McCullogh, Ext. 5293, Bldg. 150-2.

6. Effective Date:

Upon issuance.

JOHN J. CUNNINGS
Chief, Engineering Support Division

(7) Fires

(a) The machine operators will be instructed by Fire Protection Section on materials and methods for controlling small fires such as hot chips and sparks.

(b) In case of fire, beyond the control of the machine operator, area will be evacuated immediately and the Fire Protection Section will be notified.

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6. Effective Date:

Upon issuance.

JOHN J. CUNNINGS
Chief, Engineering Support Division