

REGULATORY OPERATIONS DEPARTMENT OF THE ARMY HEADQUARTERS UNITED STATES ARMY MATERIEL COMMAND 5001 EISENHOWER AVE., ALEXANDRIA, VA. 22304

AMCSF-P

4 November 1974

US Atomic Energy Commission Materials Branch ATTN: Mr. Douglas M. Collins Directorate of Licensing Washington, DC 20545



Dear Sir:

Reference AEC Docket No. 40-6639.

In reply to your letter, dated 25 October 1974, concerning Frankford Arsenal's application for amendment to Source Material License SUB-459, this headquarters is forwarding reply, dated 25 October 1974, from US Army Armament Command.

This headquarters regrets the delay in the reply to your 13 May 1974 letter of inquiry; a change in personnel at Frankford Arsenal was a factor in the delay.

Sincerely yours,

DAR

Chief, Health Physics

3 Incl 1. SARFA-Z6000 ltr, dtd 17 Sep 74 w/AMSAR-SF 1st Ind 2. USAEC ltr,

- dtd 25 Oct 74
- 3. USAEC ltr, dtd 13 May 74

Cy Furn: Commander, US Army Armament Command, ATTN: AMSAR-SF, Rock Island, IL 61201 Commander, Frankford Arsenal, ATTN: SARFA-Z6000, Philadelphia, PA 19137

Safety Office

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DEPARTMENT OF THE ARMY FRANKFORD ARSENAL PHILADELPHIA, PENNSYLVANIA 19137

IN REPLY REFER TO: COMMANDING OFFICER FRANKFORD ARSENAL ATTN: SMOKA ATTN:

SARFA-Z6000

17 September 1974

SUBJECT:

Amendment to AEC Source Material License No. SUB-459 Issued To Frankford Arsenal

Commander US Army Armament Command ATTN: AMSAR-SF Rock Island, Il 61201



The information requested in the USAEC letter dated 13 May 1974, subject as above, is furnished herein. Paragraphs below refer sequentially to the correspondingly numbered paragraphs in the USAEC communication:

The thorium program outlined in the "Application for Source Material l. License" dated 5 February 1974 is not expected to generate airborne thorium. The coating machine operation itself is a closed system vacuum process in which loose particles of thorium would be trapped in the vacuum pump oil. Initial air sampling, as described in par. 2 below will be conducted to verify that during routine operations, airborne thorium is not being produced. Under non-routine circumstances, some thorium may become airborne by spillage from the spatula while the thorium is being loaded into the coating machine. As a "worst case" analysis of this situation, one can consider the airborne contamination to be confined to the laboratory in which the coating machine operation is performed. The air volume of the lab is 1.53X10<sup>0</sup> ml, so that if the total load of 2 gm were to become airborne, the MPC of 6X10<sup>-</sup>11 microcurie • ml-<sup>1</sup> would be momentarily exceeded by a factor of approximately 25. This airborne thorium concentration would not constitute a notifiable incident under 10 CFR 20.403. Furthermore, the average annual airborne concentration can be calculated assuming that the total load is released. Since each run requires at least four hours, only one run can be conducted per day, so a maximum of 250 runs would be conducted per year. Since 2 gm of thorium are used per run, the total annual load would be 500 gm or 55.5 microcuries. Considering that 12 room air changes take place in a room with no windows or exterior doors, (ASHRAE Guide & Data Book, Fundamentals and Equipment, American Society of Heating Refrigerating and Air-Conditioning Engineers, 1963, p432.) the total annual room air volume would be 6.7X10<sup>11</sup>.ml. This would result in an average airborne thorium concentration of 8.3X10-11 microcurie · ml-<sup>1</sup>. Although these calculations do not consider the gravitational settling of the dust nor the mechanical dilution ventilation provided by the air conditioning system,

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with the small quantity of thorium used, the general room ventilation is considered to be adequate even in the event of spillage.

2. Air Sampling will be conducted by collecting the airborne particles on Whatman 41 filter paper by drawing the air through a Unico air sampler at a collection rate of 30 liters per minute. The sampling point will be representative of the operator's breathing zone. The sample deposited will be counted for alpha activity in a Beckman Wide Beta II gas proportional counting system and the airborne concentration computed. The survey program for airborne thorium will include collecting initial air samples during routine operations. The frequency of subsequent sampling will be established by the Radiation Protection Officer and will depend on the findings of the initial samples and the frequency of the thorium operation.

3. As is specified in Supplement #2 to the "Application For Source Material License" dated 5 Feb 1974, thorium cleanup operations are designed to be performed in such a manner as to contain thorium contamination. Specifically, procedures include covering the interior of the coating chamber and fittings with aluminum foil and spraying the foil prior to removal with acrylic spray lacquer to entrap loose particles; manually decontaminating the equipment prior to rinsing; and disposing of residual thorium and decontamination materials as solid radioactive waste. In reference to 10 CFR 20.303, thorium fluoride is soluble in water and if the entire possession limit of 10 lbs (500 microcuries) were released into the sewerage system, the value of ten times the quantity of thorium specified in Appendix C of Part 20 would not be exceeded. Since no other radioactive materials are routinely released into the sewerage system at this installation, a total release of 1 Ci per year would not be approached.

FOR THE COMMANDER:

J. MEDINA deCRUZ, M.D. Acting Chairman Radiant Energy Committee

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AMSAR-SF (17 Sep 74) 1st Ind SUBJECT: Amendment to AEC Source Material License No. SUB-459 Issued To Frankford Arsenal

HQ, US Army Armament Command, Rock Island, IL 61201 2 5 OCT 1974

TO: Commander, US Army Materiel Command, ATTN: AMCSF-P

Basic letter contains Frankford Arsenal's reply to USAEC letter, dated 13 May 74, SAB. Request reply be **forwarded** on to the USAEC for consideration and approval.

FOR THE COMMANDER:

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Edward P/

EDWARD P. MORAN, JR. Acting Chief, Safety Office