



Westinghouse Electric Corporation

Lamp Division

Bloomfield, N. J.

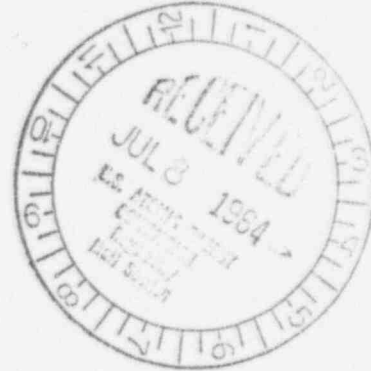
Telephone: 621-9000

Area Code 201

July 6, 1964

DML:RLL
40-2286

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U. S. Atomic Energy Commission
Washington 25, D. C.

Attention of Mr. R. L. Layfield
Division of Materials Licensing

Gentlemen:

In response to your letter of June 3, regarding our application for renewal of Source Material License No. SMB-353, we are pleased to submit the attached data which we believe will serve to answer the seven (7) questions proposed in your letter of June 3.

Should you require any information in addition to the attached, your inquiry will receive our prompt attention.

Very truly yours,

[Signature]
P. E. Murphy
Section Supervisor
Purchasing Department

PEM:fmb

Attachments - 8

(5 dups + 3 sheets)

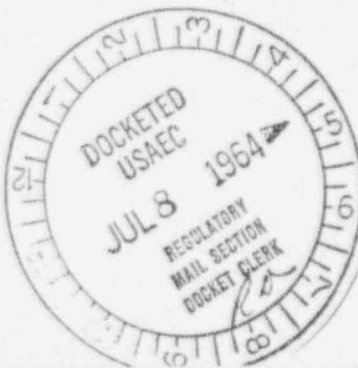
✓ B260 BX-137

B260 BX-138

B260 BX-141

Section of Div. AA 231 DS-7

" " Div. AA 231 GG-18



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COMPLIANCE

ACKNOWLEDGED

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SUBJECT: AEC License SMB 353

The information requested by the AEC for their consideration in the renewal of our license SMB 353 is given below.

Item 1. Accompanying this letter are floor plans of areas in which thorium nitrate and thorium oxide are handled.

A. Drawings AA 231DS-7, 231GG-18, and B260BX-138 picture the areas in which thorium oxide is processed to make thorium rod or sheet. Thorium oxide is weighed at Area E in an exhausted hood with a velocity of 100 fm (drawing 231DS-7). It is then moved to Area C where it is washed with acetic acid, water rinsed, and oven dried (same drawing). The hood in Area C has a velocity of 100 fm. The material is then transferred to the press room, shown on drawing 260BX-138, where it is pressed into ingots. Following pressing, the ingots are returned to Area C where they are vacuum sintered. The velocity of the furnace hood is 100 fm. It is then ready for shipment to customers or is moved to the rolls (Area D), where it is rolled into the desired sheet size. This operation is performed infrequently. During the past 2 years only about 5 per cent of one man's time was spent in the processing of thorium oxide.



B. Thorium nitrate is processed in the areas shown in drawings B260BX-141, 138, and 137A. In Area 4 (drawing 141) a bag of thorium nitrate is mixed with water for an hour. Air velocity for exhaust system at the mixer is 100 fm. At Area 5 (same drawing) tungsten oxide and the solution of thorium nitrate is mixed and dried under vacuum in the PK blender. Exhaust hood at blender has a velocity of 100 fm. The dried doped oxide is roasted (Areas 7 and 8, same drawing). Air velocity of hood at entrance to furnace is 250 fm; at the discharge end it is 100 fm. After roasting, the oxide is crushed at Area 9 (same drawing). Air velocity at crusher is 350 fm.

After crushing, the oxide is transported to building 6, Area 3 (drawing 137A), where it is transferred to boats under a hood. Air velocity at hood is 250 fm. It is then passed through at the reduction furnace, Area 2 (same drawing).



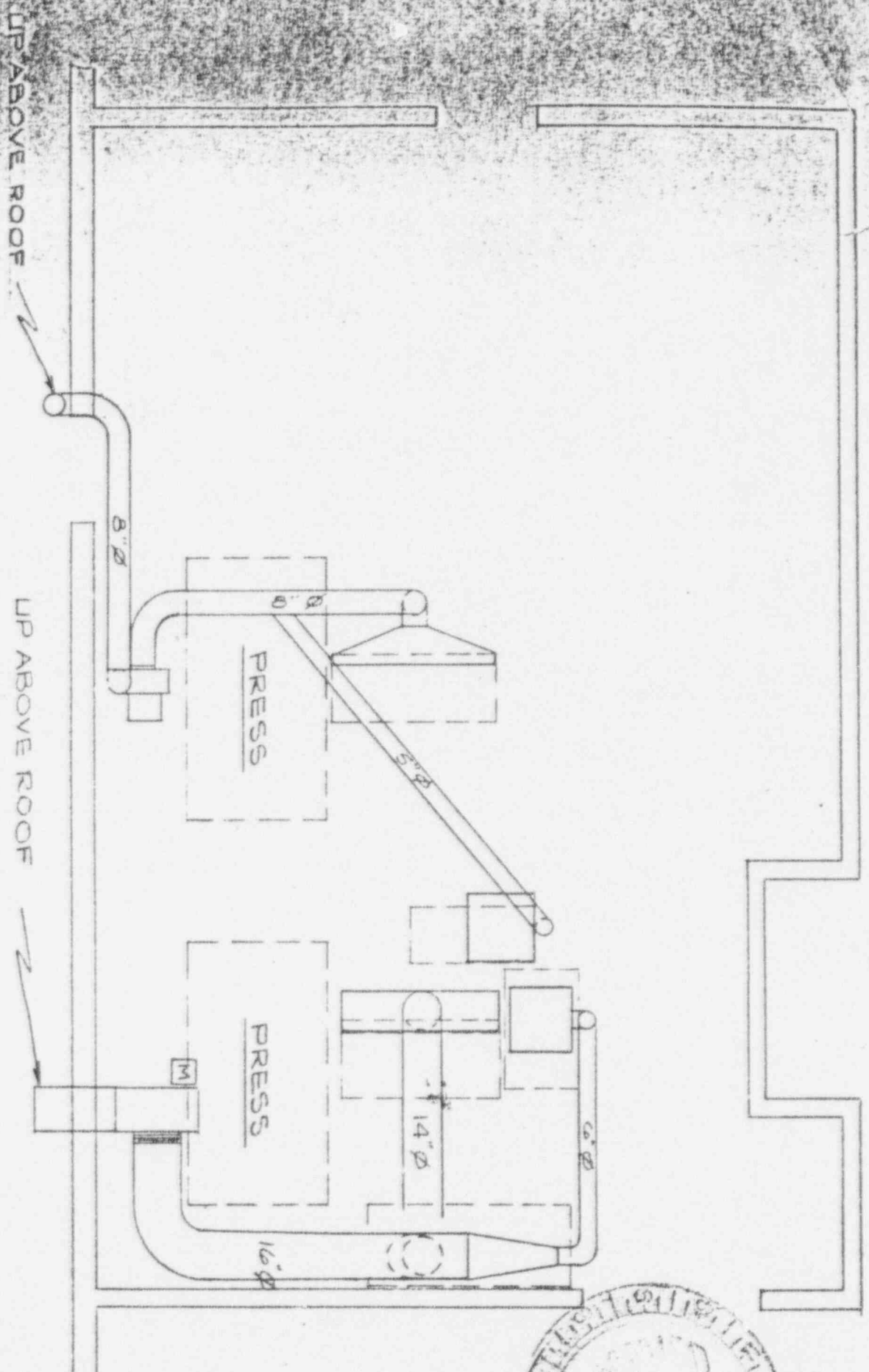
The oxide is unloaded under a hood, Area 3A (same drawing), air velocity 250 fm. Following the unloading, it is sieved into cans at Area 1 (same drawing), air velocity 200 fm. It is then brought back to building 9 and blended in blender, Area 6 (drawing 141). It is then stored in Area 16 (drawing 138), in special cans in a roped off, clearly marked area. When the metal is to be pressed, it is brought to the press room and sieved at Area 12 (same drawing), air velocity 100 fm. It is then pressed, Area 14 (same drawing), into an ingot.

Item 2. Exposure of personnel to air-borne radioactivity is evaluated by the practices described below.

- A. Film badges supplied by R. A. Landaur Co. are worn by each employee who handles thorium nitrate or oxide. Badges are changed monthly. Exposed badges are processed by Landaur. A monthly and yearly record of the exposures are kept on file in the Bloomfield Plant Safety Office. Area film badges are used to include total area exposures. They are placed at locations indicated on the accompanying floor plans (Symbol .
- B. Each employee working with thorium nitrate or thorium oxide is given a physical examination, a chest x-ray, and a blood count twice a year to determine that exposure to thorium has not produced any detectable physiological changes.
- C. Exposure to thorium nitrate or oxide is reduced by alternating employees' assignments so that they are working with these materials only 50 per cent of the time.
- D. Air samples are taken one per month at the operator's breathing level in the locations indicated on the accompanying floor plans (Symbol ). A 1/10 hp. 115 V, 60 cycle motor attached to a Brooks Mite Rotameter R-200, size No. 6, with stainless steel ball, capacity 9.0-90 cfm with aerosol filter holder, is used to draw 1 cfm through a 3-inch diameter membrane filter paper, type GM-5, pore size 55u. Sample papers are evaluated by the W Industrial Hygiene Laboratory, East Pittsburgh, through the use of scintillation counter. Results are kept on file in the Safety Office, Bloomfield Plant. If the counts are high, additional samples are taken after corrective action.

- E. A GM survey meter, Baird Atomic Co., Model 420, is used monthly to measure radiation in the areas indicated on the accompanying floor plans (Symbol \square). Readings are recorded in a department log.

- Item 3. The concentration of air-borne radioactivity in the ventilation system effluents is included in the monthly taking of air samples as described under Item 2, Section D.
- Item 4. The concentration of radioactivity on the surfaces of floor and equipment is determined by once a month making a smear with a 1-inch diameter membrane filter, type Gm-5, pore size 65u. The smear papers are evaluated by the W Industrial Hygiene Laboratory, East Pittsburgh, in a scintillation counter. Smears are made in the areas indicated on the accompanying floor plans (Symbol \circ). If the results are high, smears are made immediately after corrective measures are taken.
- Item 5. No procedures have been developed to evaluate hand exposure of those handling radioactive materials. Since film badge readings have been well within the limits as prescribed in 10 CFR, Part 20, it is the opinion of the W Industrial Hygienist that hand exposure does not require separate evaluation.
- Item 6. Contaminated areas are cleaned by vacuuming, brushing, and scrubbing with water and detergent. Floors and equipment that normally become contaminated are cleaned every 2 weeks; if smear readings are high, immediate corrective action is taken.
- Item 7. The training and experience of Dr. R. Corth, Radiological Safety Officer, is described in the application of March 4, 1964, for the renewal of license 29-3822-1.



EXHAUST SYSTEMS FOR THORIATED TUNGSTEN

SCALE: 1/4" = 1'-0"



DSK 91674-A2

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TO: Layfield		ORIG. <input checked="" type="checkbox"/> CC <input type="checkbox"/> OTHER <input type="checkbox"/>		OTHER	
CLASSIF. U		POST OFFICE REG. NO.		FILE CODE: 40-2286 (suppl. only)	
DESCRIPTION: (Must Be Unclassified)		ACTION NECESSARY <input type="checkbox"/> NO ACTION/NECESSARY <input type="checkbox"/>		CONCURRENCE <input type="checkbox"/> DATE ANSWERED BY: <input type="checkbox"/>	
Ltr. ref. our 7-8 job. card and trans.		REFERRED TO: Business 7-15		DATE	
ENCLOSURES:		v/cls of (ltr. only)		DATE	
Two(2) addtl. oya. of each of the (5) dya. submitted with their letter of 7-6-64....		1-compliance act(dya. only)		DATE	
REMARKS:		Mail Deem Distribution: 1- 200 v/oy. each of the two(2) dya. not marked proprietary		DATE	
		3-PROPRIETARY MARKED DATA. V/BEID PENDING		DATE	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC 3265 (8-60)