FORM NRC-2 (7-77) 10 CFR 40

Approved by GAO R0203

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1 (Check one)		2 NAME OF APPLICANT	*
(a) New license		Martin Martin Martin	Lamp
(b) Amendment to License No.		Westinghouse Electric Corp. Division	
K (c) Renewal of I	License No. SMB-353	cense No. SMB-353 1 Westinghouse Plaza	
(d) Previous License No.		Bloomfield, N.J. 07003	
STATE THE ADDRESSIES	AT WHICH SOURCE MATERIA	L WILL BE POSSESSED OR USED	
	SAME		
NAME OF PERSON TO BE	E CONTACTED CONCERNING I	HIS APPLICATION 6. TELEPHONE N	O. OF INDIVIDUAL NAMED IN ITEM
Richard T. Wi	lliams	201 -	165-3338
DESCRIBE PURPOSE FOR	WHICH SOURCE MATERIAL WI	LL BE USED	407-3330
SE	E ATTACHED SHEETS		
STATE THE TYPE OR T POSSESS, USE, OR TRAN	YPES, CHEMICAL FORM OR FO SFER UNDER THE LICENSE	RMS, AND QUANTITIES OF SOURCE M	ATERIAL YOU PROPOSE TO RECEIVE
(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (Includin % U or Th.)	(d) MAXIMUM AMOUNT AT ANY ONE TIME (kilograms)
ATURAL URANIUM			
RANIUM DEPLETED IN		R	ECEIVED BY LEMB
HE 0-233 13010FE		Date	10/31/77
HORIUM (ISOTOPL)		Time	m
(e) MAXIMUM TOTAL QU	ANTITY OF SOURCE MATERIAL	YOU WILL HAVE ON HAND AT ANY TIM	allers 1
		From	(knograms)
0 LIST THE NAMES AND APPLICANT'S SUPERVIS PLICANT IF AN INDIVIS 1 DESCRIBE THE EQUIPME AND RELATE THE UP OF AND RELATED INSTRUME reliation detection inscisiones strument).	ATTACH A RESUME OF THE TE SORY PERSONNEL AND THE PI DUAL) NT AND FACILITIES WHICH WILL THE EQUIPMENT AND FACILITI ENTS (including film badges, d-aime its should actual the instrament char	BE USED TO PROTECT HEALTH AND MIR ESTO THE OPERATIONS LISTED IN ITEM INTER, counters, air sampling, and other survey e actenistics such as type of radiation detected, wi	NG TRAINING AND EXPERIENCE OF TION SAFETY PROGRAM (OR OF AP NIMIZE DANGER TO LIFE OR PROPERTY 9 INCLUDE (a) RADIATION DETECTION quipment as appropriate. The description of indow thickness, and the range(s) of each in
(b) METHOD, FREQUENC EQUIPMENT (for film)	8603250440 7710 REG1 LIC40 SMB-0353	25 PDR ALIBRATING INSTRUMENTS LISTED IN nd processing, or name supplier).	(a) ABOVE INCLUDING AIR SAMPLING
m NRC-2 (7-77)			Qc1-77-19





Page 2 H(c). VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST. FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS. MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PRO-CEDURES FOR TESTING SUCH EQUIPMENT. DING 12 DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PRO-CEDURES TO THE OPERATIONS LISTED IN ITEM 9. INCLUDE (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCI-DENTS. SUCH AS FIRE, EXPLOSION, ETC. IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS (b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL (c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES 13. WASTE PRODUCTS: If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here [] and explain on a supplemental sheet. (a) Quantity and type of radioactive waste that will be generated. (b) Detailed procedures for waste disposal. 14 IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING: (a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT (b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT. (c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (Specify instrument used, date of calibration and calibration technique used) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES. (d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MAN-UFACTURED PRODUCT. CERTIFICATE (This item must be completed by applicant) 15. The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief. BY: Z.B. Margraff Dated October 25, 1977 L. B. Margraff Manager of Purchases (Trite of centurying official authorized to act on behall of the applicant) WARNING: 18 U.S.C. Section 1991; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

Form NRE 2 17 771

SJURCE MATERIAL LICENSE RENEWAL

- 7 (a) Thorium oxide is mixed with carbonates to form a mixture which is applied to the electrodes of the mercury vapor lamp.
 - (b) Thorium nitrate is mixed with tungsten oxide to form a 1% thorium tungsten wire. Thorium oxide is mixed with tungsten oxide to form 2% thoriumtungsten wire.
 - (c) Thorium oxide is reduced to thorium to make thorium sheet and/or rod.
- 8 (a) Thorium oxide & nitrate
 - (b) Powder
 - (c) 2428 kg
 - (d) 2482 kg
- 9 (a) 1200 grams of thorium oxide is placed in a ball mill jar with carbonates and ethyl denatured alcohol and milled. After milling, the mixture is dried in a vacuum oven. It is sieved and then reduced in a hydrogen atmosphere oven. The mixture is again milled with ethyl denatured alcohol and placed in 8 ounce jars to be shipped to the using plant.
 - (b) 3 1/2 kg of thorium nitrate is placed in a PK blender with 35 kg of tungsten oxide to form a 1% thorium-tungsten mixture. The blended mixture is then transferred to a roasting oven. After roasting, it is crushed and sieved. It is then fired in a reducing oven and sieved into cans holding about 25 kg. The contents of several cans are blended. The mixture is then taken to the ingot press where it is pressed into an ingot .5" X .75" x 24". The ingot is sintered and then drawn into 1% wire.

To make 2% wire, 10 kg of thorium oxide is blended with 500 kg of tungsten. The mixture is roasted, crushed, sieved, reduced and pressed and sintered as described in the manufacture of 1% wire.

(c) Thorium metal sheet and rod is made by washing 1.6 kg of thoroum oxide with acetic acid. It is then water washed and oven dried and fired in a reducing oven. It is then pressed into ingots, the ingot sintered and cold rolled into sheet or rod. This is an infrequently performed operation requiring approximately 100 manhours per year.

All transfer, crushing and sieving of dried mixtures are done under exhaust hoods with a minimum velocity of 150 feet per minute. The exhaust systems

discharge through ultra filters on the roof of the building. Personnel air samples, exhaust stack discharge air samples and smears of walking and working surfaces are made monthly. These samples are evaluated in a sintillation counter at the <u>W</u> Industrial Hygiene Lab in Pittsburgh, Pennsylvania. The results are reported to the Bloomfield plant.

- Radiation safety officeris R. T. Williams. See letter of ______ listing his technical qualifications.
- 11(a) Film badges, Eberline Alpha Counter, Model PAC-15A, Baird Atomic G. M. Survey meter, Model 420, smears of walking and working surfaces are used to evaluate employe exposure alpha and beta particulant and gamma rays. Personnel and roof air samples and smears are taken monthly and evaluated by <u>W</u> Industrial Hygiene Lab in Pittsburgh. The Alpha Counter is used to measure alpha activity in the work areas. Film badges are worn by employes with exposure to thorium oxide. Area film badges are used to measure total area exposure. The badges are evaluated monthly. Employes work with thorium are given a yearly physical exam and a CBC.

Contaminated waste or thorium scrap generated during any of these operations is placed in 55 gallon drums supplied by Radice Research, License #1242-1461.

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manufacture of 1% wire.

(c) Thorium sheet and rod is made by blending 1980 grams of thorium oxide with 1220 grams of calcium metal and fired in an atmosphere oven. It is then washed with acetic acid, water washed and oven dried. This yields metal powder. It is then pressed into ingots, the ingot sintered and cold rolled into sheet or rod. This is an infrequently performed operation requiring approximately 100 manhours per year.

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All transfer, crushing and sieving of dried mixtures are done under exhaust hoods with a minimum velocity of 150 feet per minute. The exhaust systems discharge through ultra filters on the roof of the building. Personnel air samples, exhaust stack discharge air samples and smears of walking and working surfaces are made monthly. These samples are evaluated in a scintillation counter at the \underline{W} Industrial Hygiene Lab in Pittsburgh, Pennsylvania. The results are reported to the Bloomfield plant.

- 10 (a) Radiation safety officer is R. T. Williams. He has attended the course Living With Radiation given by the AEC and the course Radiological Health presented by HEW. He has served as safety engineer at the <u>W</u> Nuclear Testing Reactor at Waltz Mills, Pa. and the <u>W</u> Astronuclear Lab, Large Pa. He is a graduate of Syracuse University.
- 11 (a) Film badges, Eberline alpha counter, Model PAC-15A, Baird atomic G.M. survey meter, Model 420, smears of walking and working surfaces are used to evaluate employe exposure alpha and beta particulant and gamma rays. Personnel and roof air samples and smears are taken monthly and evaluated by <u>W</u> Industrial Hygiene Lab in Pittsburgh. The alpha counter is used to measure alpha activity in the work areas. Film badges are worn by employes with exposure to thorium oxide and nitrate. Area film badges are used to measure total area exposure. The badges are evaluated monthly. Employes

These drums are removed from the plant by the licensed disposal service when they are filled.

- (b) The Eberline Alpha Counter and the G. M. Counter are calibrated every six months at the health physics lab at the <u>W</u> Plutonium Fuels Development Lab, Cheswick, Pennsylvania. R. S. Landauer supplies and evaluates the film badges on a monthly basis.
- (c) Operations involving the transfer of dry powdered thO₂ or mixtures containing ThO₂ are provided with an exhaust system for dust removal. A minimum of 150 feet per minute is provided at each hood or duct opening. Particulant material is removed from the exhaust systems discharges by ultra filters. The roof air samples are taken at the down stream side of the filters. Filters are changed when the pressure differential reach _______. An Alnor, Jr. velometer is used to measure the air velocity at hood and duct openings. An incline manometer measures the pressure arch across the ultra filters.
- 12 (a) Employes working with thorium oxide or nitrate have attended a training session on nuclear safety presented by the Radiation Safety Officer (outline enclosed). These employes are instructed to exercise care in handling thorium oxide and mixtures containing this radioactive material to avoid creating dust, to clean up any spills promptly, to wash hands and face before eating, drinking, smoking or applying makeup. They are not permitted to eat, drink nor smoke in the thorium processing areas.

Flammable liquids used in processing thorium are kept in safety cans. Combustible rubbish is removed daily from the work area. All work areas are sprinkled.

Thorium oxide is stored on a locked balcony above the processing areas. See Drawing SK-8227 enclosed.

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- 12 (b) In the event of a fire in an area where thorium oxide is stored or processed, the firebrigade and employes in the area have been instructed to wear respirators with ultra filters or self-contained breathing apparatus. Air samples and smears and the Eberline Alpha Counter would be used to evaluate the degree of contamination.
 - (c) Radiation survey program has been described in Section II (a), (b) and (c).
- 13 (a) Sheets of wrapping paper used to cover counter tops. Trimmings from thorium sheet and rod. Plastic bags that have held ThO2. Three drums per year.
 - (b) Filled 55 gallon drums removed from plant by Radiac Research, License # 1242 - 1461.
- 14 (a), (b), (c), (d) See attached letter of 3/10/65 to Atomic Energy Commission requesting exemption and copy of 10 CFR 40.13 (c)(1) establishing this exemption.

R. T. Williams 9/77

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NUMBER OF PAGES:

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