

THE MARTIN COMPANY

Baltimore 3, Maryland

W-756

October 13, 1960

U. S. Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attention: Mr. D. Smith

Gentlemen:

It is requested that a Byproduct Material License be issued to cover necessary decontamination of the hot cells and adjacent areas at the Radioactive Materials Laboratory leased from The State University of Pennsylvania at Quehanna.

The contamination exists primarily in two of the cells. The maximum general radiation level is about 20 mr/hr and the maximum contamination is of the order of 200,000 d/m per 100 cm².

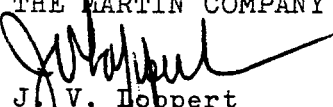
The decontamination will be accomplished by personnel who have been trained specifically to decontaminate this facility. The work will be directly supervised by the Health Physics Section.

Attention is called to the fact that license material owned by others is stored in one of the cells. All the material is stored in adequate casks so that it can be moved. As a part of the decontamination process it may be necessary to move the shielded sources to another location in the facility. This will be done under the direct supervision of the Health Physics Section. None of the casks will be opened by The Martin Company.

Three copies of Form AEC-313 and supplemental sheets are enclosed in support of this application. Should you require any further information contact me or Mr. Richard H. Boutelle, X9517-8.

Very truly yours,

THE MARTIN COMPANY


J. V. Loppert
Licensing Officer

Encl:

29833

B-29

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<p>1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)</p> <p>The Martin Company Nuclear Division Baltimore 3, Maryland</p>	<p>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)</p> <p>Radioactive Materials Laboratory in facilities leased from The Pennsylvania State University at Quehanna, Pennsylvania</p>
<p>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</p> <p>Engineering Test Section Nuclear Engineering Department</p>	<p>3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)</p>
<p>4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)</p> <p>Donald L. Peters, Health Physics Specialist</p>	<p>5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)</p> <p>Richard H. Boutelle, Chief Health Physics Section</p>
<p>6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)</p> <p>Co⁶⁰ Fission Products</p>	<p>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)</p> <p>Any form Occurring as contamination chiefly Any form in Hot Cells and Isolation Areas.</p> <p>Total contamination is less than 500 mc.</p>

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

Decontamination of facilities in preparation for alteration and installation of new equipment.

DUPLICATED
FOR DIV. OF COMPLIANCE

29833

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	The Martin Company	3½ yrs.	Yes <input checked="" type="checkbox"/> No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	The Martin Company	"	Yes <input checked="" type="checkbox"/> No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity	The Martin Company	"	Yes <input checked="" type="checkbox"/> No	Yes No
d. Biological effects of radiation	The Martin Company	"	Yes <input checked="" type="checkbox"/> No	Yes No

9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-60	2000 curies	The Martin Company	3½ yrs.	Performs all necessary surveys and measurements to assure safe use of these isotopes.
Sr-90	20 curies	" " "	"	
Po-210	2100 curies	" " "	"	
U-235	millicurie amounts	The Martin Co.	"	

10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)
Ion Chamber, NRD Model CS-40	2	Beta-gamma	0-20,000mr/hr	75 mg/cm ²	Monitoring Measuring
GM Counter TMC Model SG-2A	1	Beta-gamma	0-1,000,000 c/m	2.03 mg/cm ²	Measuring
GM Survey Meter NMC Model 700	3	Beta-gamma	0-50 mr/hr	10 mgm/cm ²	Monitoring

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

See Supplemental Sheet No. 1

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

See Supplemental Sheet No. 2

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) **Yes No Facilities are as described by Curtiss Wright Corp in their application for Byproduct Material License**

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

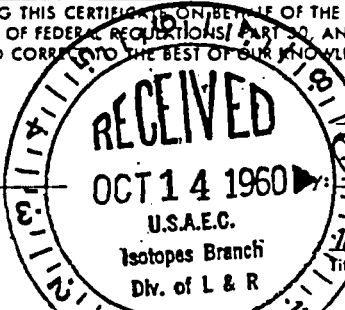
See Supplemental Sheet No. 3

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. **Waste will be packaged and held pending arrangements.**

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 20, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date October 13, 1960



The Martin Company
 (Company named in item 1)
V. Luppert
 Licensing Officer
 Title of certifying official

WARNING.—18 U. S. C., Section 1001; 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 or to any officer within its jurisdiction.

C. Bioassay

All facility personnel are required to submit bioassay samples at periodic intervals. In the case of unusual incidents, including exposure to airborne concentrations of radioactive materials exceeding the maximum permissible concentrations for personnel without respiratory protection, or other suspected ingestion of radioactive material, special samples are collected from all personnel involved.

All urinalysis results are filed as permanent records in the Health Physics office and are available to responsible persons upon request.

A. Health Physics Responsibilities

1. Plans and administers the radiation protection program to provide adequate protection to Company and to personnel, including:
 2. The inspection and monitoring of the site of various operations, instruments, or personnel, including, but not limited to, gamma and neutron irradiation of materials, laboratories, etc., to detect and prevent excessive levels of radiation or concentrations of radioactive materials.
 3. The review and approval of all working areas and facilities.
 4. The evaluation of radiation hazard control methods for adequacy and compliance with recommendations of the National Committee on Radiation Hazards and pertinent government regulations.
 5. The promotion of the Health Physics program through the proper indoctrination and training of personnel engaged in handling or working with materials or equipment that emit ionizing radiation.
5. Determines radiation monitoring equipment requirements in all areas.
7. The internal control and enforcement of licensing regulations pertaining to receiving, possession, use, transfer and disposal of nuclear source, special nuclear, or by-product materials.
8. The investigation of accidents and personnel radiation exposures to determine the cause and recommend corrective action to be taken to eliminate future occurrences.
9. The continual monitoring of personnel engaged in handling or working with radioactive materials and x-ray equipment for compliance with recommended procedures and regulations of good housekeeping and work habits.
10. The issuance of appropriate personnel monitoring devices (film badges, pocket chambers, etc.), scheduling of pre-exposure and follow-up physical examination, and the establishment and maintenance of detailed employee records of cumulative doses of radiation exposure, biological assays, laboratory reports, etc., to form the basis of permanent Company records and to conform to Atomic Energy Commission regulations.
11. The conducting of laboratory tests of environmental sample analyses and biological assays to determine the quantity of radioactivity discharged to the environs and the quantity received by the individual through inhalation, ingestion, wounds, etc.

12. Collaborates with representatives of the various military and departments concerned on reactor site surveys, design of safety systems for power reactors and associated control systems for reactor evaluation and control to assure protection of personnel and facilities.
13. Maintains liaison with representatives of the Atomic Energy Commission, National Committee on Radiation Hazards, Federal, State and Local government health and welfare agencies, and various agencies and departments, to resolve areas of common health physics interest.
14. Prepares and revises as necessary Health Physics bulletins outlining procedures to be followed to assure compliance with all pertinent National Committee or radiation hazards recommendations and government regulations.
15. The calibration of all Health Physics monitoring instruments where radiation sources must be used to perform the calibration.

B. Leak Testing

Leak tests are performed on all sealed sources when they are received and at least once every three months thereafter. The source, or source shield depending upon the strength of the source, is wiped with a filter paper disc. The disc is then counted in the proper radiation counter to detect and measure any leakage of alpha or beta-gamma contamination.

Radium sources are leak tested by wrapping the source in cotton for approximately three days, removing the cotton and counting it with a beta-gamma detector.

Leak tests are performed by Health Physics technicians who have had three years of on-the-job Health Physics training with The Martin Company.

Maintenance, service and repairs to all sources are performed by the source supplier.

Item 11

Calibration of Health Physics Survey Instruments is performed in the Calibration Facility located in the Center for Environmental Health, the Nuclear Manufacturing and Engineering Laboratory, Building 205, 1. Each instrument is calibrated once a month. Survey instruments are calibrated when they are returned to Health Physics.

The sources are located in one corner of the East Room behind a four foot high, eight inch thick, cement block wall. One Curie Co-60 source contained in a lead-steel shielded container is used for calibrating "Cutie-Pie" and similar type instruments.

The source is calibrated so that at given distances the dose rate in mr/hr is known. The instrument can be remotely placed at a given distance from the source and calibrated to read the field of radiation at that distance. Where possible, each instrument is calibrated on each scale or range setting.

Smaller sources include an eight millicurie Co-60 source and a one millicurie Ra-226 source. These are also stored behind the shielding wall and used to calibrate low range (up to 20 mr/hr) instruments.

Neutron survey instruments are calibrated by using a five curie Po-Be neutron source of known flux (determined by foil activation) and setting the instrument to read the correct level.

Counting room instruments are calibrated by using standard calibrated sources of uranium alpha and beta-gamma. The first step is construction of a "plateau" to determine correct operating voltages. The counter efficiency is then determined by comparing the counter countrate with that of the standard source.

DUPLICATED
FOR DIV. OF COMPLIANCE

Item 12

A. General

All personnel working with radioisotopes temporarily, are required to wear film badges sensitive to beta-gamma radiation.

Personnel working with radioisotopes where protection is provided against alpha, beta, gamma and fast neutrons and where there are no slow neutrons.

Film badges are changed either weekly, biweekly, or each 4 weeks depending upon the radiation levels in the work areas. Pocket chambers are changed and read daily. Self-reading dosimeters are also available and used under the discretion of Health Physics.

A film badge service is contracted on a yearly basis to supply and process film and badges for the program. The present supplier is Health Physics Services, Baltimore, Maryland.

B. Dosimetry Information:

Special film badge changes are made by Health Physics when any of the following conditions exist:

- (1) Both pocket chambers off scale.
- (2) Exposure in excess of 100 mr/wk is recorded from daily pocket chamber readings.
- (3) Inexplicable exposure in excess of 50 mr per day is recorded.

Permanent records are maintained of all film badge and pocket chamber results.

The upper limit of dosimetry response is as follows:

<u>FILM BADGES</u>	<u>UPPER LIMIT</u> (rem)
Gamma	1000
Beta	500
Neutrons	100
<u>POCKET CHAMBERS</u>	
Gamma	200 mr
Neutrons	200 mrem