

Amend 1
19-1398-19

THE MARTIN COMPANY

Baltimore 3, Maryland
January 29, 1960
Mail No. W-756
Nuclear Division

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

Attention: Mr. James R. Mason, Chief
Isotopes Branch

Gentlemen:

It is requested that License No. 19-1398-10 heretofore issued to The Martin Company be amended to extend the expiration date and to reflect the changes noted in the enclosed form AEC-313.

Since License No. 19-1398-10 expires on January 31, 1960, it is requested that you extend the validity of the license for a period sufficient to allow your evaluation of the enclosed application. It is also requested that License No. 19-1398-19 be cancelled since the work involved in that license is covered in the enclosed application.

Enclosed, in triplicate, are AEC Forms 313 detailing the changes requested. Any additional information will be submitted upon request. You can contact me at MURdock 7-3800 - Extension 8281 or 9668.

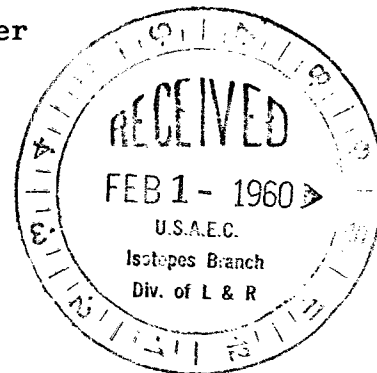
Very truly yours,

THE MARTIN COMPANY

J. V. Loppert (RMB)

J. V. Loppert
Licensing Officer

JVL/agc
Enclosures



A/43
23795

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.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)

The Martin Company
Nuclear Division
Baltimore 3, Maryland

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)

Radioisotope Laboratory, "D" Bldg.
Middle River, Maryland
(Radiograph Room)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Materials Service Unit,
Nuclear Components Department

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

19-1398-10

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.)

C. E. Hollens

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.)

Richard H. Boutelle
(Resume previously submitted)

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

A. Ir¹⁹²

B. Sr⁹⁰-Yt⁹⁰

C. Co⁶⁰

D. Tm¹⁷⁰

E. Any byproduct material between Atomic Nos. 3 and 83 inclusive.

(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.)

Sealed sources, Technical Operations Inc., Model A424 - 62 curies max., 31 curies/source max.

Sealed sources, Tracerlab model RA-2 150 millicuries max. Tracerlab model S-1 - 150 millicuries/source max.

Sealed sources, Technical Operations, Inc., Model A-424 10 curies max., 5 curies/source max.

Sealed Sources, Technical Operations, Inc., Type A capsules, 120 curies max., 60 curies/source max.

Irradiated metal samples, 2000 millicuries max. total of byproduct material between Atomic Nos. 3 & 83 inclusive.

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.)

Ir¹⁹² to be used in Technical Operations Model 412 projector for industrial radiography at the Martin Plant, Middle River; (B) Sr⁹⁰-Yt⁹⁰ to be used for instrument calibration and for research and development programs in the radioisotope laboratory. (C) Co⁶⁰ to be used in Technical Operations Model 402 projector for industrial radiography at the Martin Plant, Middle River; (D) Tm¹⁷⁰ to be used for instrument calibration and for research and development programs in the radioisotope laboratory. (E) Atomic Nos. 3 & 83 inclusive - experimental tool wear studies and sea water corrosion tests conducted in the radioisotope lab.

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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)	
			Yes	No	Yes	No
a. Principles and practices of radiation protection.....	See 19-1398-10 Amendment #3 and our letter dated September 3, 1958. Mr.		Yes	No	Yes	No
b. Radioactivity measurement standardization and monitoring techniques and instruments.....	Hollens is currently a Materials Engineer with the Materials Service Unit and conducts the industrial radiography program and corrosion test program.		Yes	No	Yes	No
c. Mathematics and calculations basic to the use and measurement of radioactivity...			Yes	No	Yes	No
d. Biological effects of radiation.....			Yes	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
See 8 above.				

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, Victoreen Model 592	4	Gamma	0-1,000 mr/hr	Encased	Monitoring Measuring
Ion Chamber, Victoreen Model 740	3	Beta-gamma	0-10,000 mr/hr	0.9 mg/cm ²	Measuring Monitoring
Ion Chamber, NRD Model CS-40	2	Beta-gamma	0-29,000 mr/hr	75 mg/cm ²	Monitoring Measuring.

(CONTINUED ON SUPPLEMENTAL SHEET NO. 1)

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

(See SUPPLEMENTAL SHEET NO. 2)

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. 3)

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 See application for 19-1398-10 and supplementary report "Health Physics Procedures During the Use of Radiography Sources" MND 2109

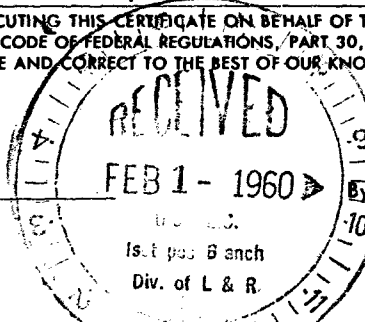
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. (See SUPPLEMENTAL SHEET NO. 4)

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. (See SUPPLEMENTAL SHEET NO. 5)

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 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date January 29, 1960



THE MARTIN COMPANY

Applicant named in item 1

By: J. V. Loppert (Signature)

J. V. Loppert

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 as to any matter within its jurisdiction.

Question No. 10 - Radiation Detection Instruments

Type of Instrument	No. Avail.	Radiation Detected	Sensitivity Range	Window Thickness	Use
GM Survey, Nuclear Chicago Md 2612	6	Beta, gamma	0-60,000 c/m 0-20 mr/hr	35 mg/cm ²	Monitoring Surveying
Gas Flow Proportional Counter NMC Md PC-1A	2	Alpha, Beta-gamma	0.5-1,000,000 d/m; 100-1,000, 000 d/m	gas chamber	Measuring

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SUPPLEMENTAL SHEET NO. 1

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Question No. 11 - Method, Frequency, and Standards used in calibrating instruments listed above (Question 10)

Calibration of Health Physics survey instruments is performed in the Calibration Facility located in the Waste Storage Room outside the Nuclear Manufacturing and Engineering Laboratories at Plant No. 1. Each instrument is calibrated once a month. Repaired instruments are calibrated when they are returned to Health Physics.

The sources are located in one corner of the Waste Room behind a four foot high, eight-inch thick, cement block wall. A 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.

Question No. 12 - Film Badges, Dosimeters, and Bio-Assay Procedures Used.

A. General:

All personnel working with radioactive materials permanently or temporarily, are required to wear a film badge and two pocket chambers sensitive to beta-gamma radiation.

Personnel working in areas where fast and/or thermal neutron radiation is prevalent are required to wear a film badge sensitive to beta, gamma and fast neutrons and pocket chambers sensitive to thermal neutrons.

Film badges are changed either weekly, biweekly, or each 13 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

(Question No. 12 - Cont'd.)

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.

Question No. 14 - Radiation Protection Program

A. Health Physics Responsibilities:

1. Plans and administers the radiation protection program to provide adequate protection to Company and to personnel from ionizing radiation.
2. The inspection and monitoring, with the aid of various detection instruments, of personnel, machinery, furniture, ventilating equipment, gamma and neutron irradiation test facilities, radioisotopic laboratories, etc., to detect and prevent spread of radioactivity, measure levels of radiation or concentrations of radioactive materials present.
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.
6. 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.

Question 14 - Cont'd.

12. Collaborates with representatives of the various divisions and departments concerned on reactor site surveys, design of facilities, power reactors and associated control systems for hazard 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 divisions 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.

C. See also supplementaty report MND 2109.

Question No. 15 - Waste Disposal

Solid waste is currently stored in 55 gallon steel drums awaiting disposal through an AEC approved, licensed waste disposal service. A record is maintained by Health Physics concerning the contents, radiation and number of each drum.

Liquid waste is monitored to assure that the levels of radioactivity are below the tolerances established in Title 10, Part 20 Code of Federal Regulations for disposal into sanitary sewers. All liquid waste with activity above those levels is evaporated and concentrated for eventual solid waste disposal through AEC approved and licensed waste disposal services.