

GENERAL ELECTRIC

SPACE DIVISION

GENERAL ELECTRIC COMPANY VALLEY FORGE SPACE CENTER
(MAIL: P. O. BOX 8555, PHILADELPHIA, PENNSYLVANIA 19101), Phone 962-2000

21 September 1972

Mr. Robert Brinkman
U. S. Atomic Energy Commission
Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

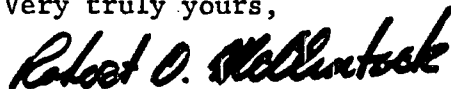
Dear Mr. Brinkman:

The enclosed application is for renewal of Byproduct Materials License 37-02006-05. Sections 6A, 6B, and 6F have been increased and Section 6D has been added to reflect anticipated growth of our program. Section 6F of the original license (350 curies Promethium in sealed sources) has been deleted since this program never materialized and we have received no Promethium sources that are not covered by Section 6A.

The safety procedures, facilities, and personnel are unchanged from those documented in our original application dated 3 September 1968.

If there are any questions regarding this application, please contact me at your convenience.

Very truly yours,



R. O. McClintock
Health Physicist
215-962-5926

/dan

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UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. 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. Include ZIP Code.)</p> <p>General Electric Company Space Division Valley Forge Space Tech Center P. O. Box 8555 Philadelphia, Pa. 19101</p>	<p>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a). Include ZIP Code.)</p> <p>1) Cabot, Cabot and Forbes Buildings (8, B, C) Allendale Rd. & 1st Ave. King of Prussia, Pa.</p>
<p>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</p> <p>Space Systems</p>	<p>3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)</p> <p>(Renewal application) 37-02006-05</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>See Attachment #1</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>R. O. McClintock</p>

<p>6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)</p> <p>A. Any byproduct material with Atomic Nos. 3 to 83. B. Any byproduct material with Atomic Nos. greater than 83.-96 C. Hydrogen 3 D. Krypton 85 E. Strontium 90 F. Any byproduct material with Atomic Nos. 3 to 83. G. Hydrogen 3 H. Americium 241</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> <table> <tr> <td>A. Sealed sources</td> <td>A. 5 curies total</td> </tr> <tr> <td>B. Sealed sources</td> <td>B. 2 curies total</td> </tr> <tr> <td>C. Sealed sources</td> <td>C. 30 curies total</td> </tr> <tr> <td>D. Sealed sources</td> <td>D. 5 curies total</td> </tr> <tr> <td>E. Sealed sources</td> <td>E. 10 curies total</td> </tr> <tr> <td>F. Any</td> <td>F. 0.5 curies total</td> </tr> <tr> <td>G. Any</td> <td>G. 5 curies total</td> </tr> <tr> <td>H. Sealed source</td> <td>H. 2 curies total</td> </tr> </table>	A. Sealed sources	A. 5 curies total	B. Sealed sources	B. 2 curies total	C. Sealed sources	C. 30 curies total	D. Sealed sources	D. 5 curies total	E. Sealed sources	E. 10 curies total	F. Any	F. 0.5 curies total	G. Any	G. 5 curies total	H. Sealed source	H. 2 curies total
A. Sealed sources	A. 5 curies total																
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C. Sealed sources	C. 30 curies total																
D. Sealed sources	D. 5 curies total																
E. Sealed sources	E. 10 curies total																
F. Any	F. 0.5 curies total																
G. Any	G. 5 curies total																
H. Sealed source	H. 2 curies total																

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.)

Research and development as defined in Section 30.4(q) of Title 10, Code of Federal Regulations, Part 30.

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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)
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	See Attachment #1		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 Attachment #1		

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)
		See Attachment #1			

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

See Attachment #1

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

See Attachment #1

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

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 Attachment #1

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 Attachment #1

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 Attachment #1

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: September 21, 1972

Robert O. McClintock
General Electric Co.-Space Division
Applicant named in item 1
By: Robert O. McClintock
Health Physicist
Title of certifying official

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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.

ATTACHMENT #1

4. Individual Users -

Individual users or supervisors of workers using radioactive materials must be approved by the Ionizing Radiation Advisory Group (IRAG). The members of the IRAG include:

Chairman: T. P. Handley, Manager Security and Administrative
Services

Secretary: R. O. McClintock, Health Physicist

Member: R. J. Panaro, M.D.

The minimum technical qualifications for supervisory personnel for radioactive materials include evidence of formal training, supervisory responsibility at General Electric Company and past experience in handling radioactive materials.

8 through 15

Items 8 through 15 are referenced in our application for License 37-02006-05, dated September 3, 1968, and in our letter for amendment dated February 23, 1971, with the following changes:

1. An updated copy of Mandatory Safety Procedure M-6 is attached to this application. This procedure replaces attachment 11 of our September 3, 1968 application.
2. Section 7 E & F is deleted from our original application. These programs are concluded.



Valley Forge Space Center Safety Manual

SUBJECT	CLASSIFICATION	ISSUED	NUMBER
IONIZING RADIATION CONTROL	MANDATORY PROCEDURE	MARCH 1971	M-6.0

6.1 PURPOSE

To state the requirements that shall apply in the use of all ionizing radiation, ionizing radiation machines, and radioactive materials to insure the maximum safety to all persons in the Valley Forge Space Center. These requirements are intended to be consistent with the regulations of the Atomic Energy Commission, Department of Health (Pennsylvania), and the recommended practices for the General Electric Company.

6.2 DEFINITIONS

1. Ionizing Radiation. Gamma rays and X-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or other radio waves, or visible infrared and ultra-violet light.
2. Ionizing Radiation Machine. Any device that produces ionizing radiation when the associated control devices are energized.
3. Radioactive Materials. Any material (solid, liquid, gas) that emits ionizing radiation spontaneously, for example: carbon-14, cesium-137, cobalt-60, radium, thorium, etc.
4. Occupational Dose. Includes exposure of an individual to ionizing radiation, (1) in a restricted area; or, (2) in the course of employment in which the individual's duties involve exposure to ionizing radiation. Occupational dose shall not include any exposure of an individual to ionizing radiation for the purpose of medical therapy.
5. Rem (Roentgen equivalent man). The quantity of any type of atomic radiation which causes the same biological effect as one roentgen of X or gamma radiation.
6. Permissible Limits for External Exposure
 - a. Personnel who are occupationally exposed to ionizing radiation in programs that are conducted under AEC contracts will be governed by the limits specified in AEC Safety Manual Appendix 0524 entitled, "Standards for Radiation Protection."

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INTERPRETATION CONTACT
HEALTH PHYSICIST

SUPERCEDES

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M-6-1
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- b. The permissible limits for external exposure to all other personnel is as specified by paragraph 20.101, "Exposure of individuals to Radiation in Restricted Areas", of Title 10, Part 20 of the Code of Federal Regulations. Also, Title 41, Part 50-204.21 of the "Safety and Health Standards for Federal Supply Contracts."
- c. Permissible Limits for External Exposure (1)

<u>Part of Body</u>	<u>Dose per 13 Consecutive Weeks (rems)</u>	<u>Accumulated Dose (rems)</u>
Whole body, head and trunk blood forming organs, gonads, lens of eyes, other organs	1.25	5(N-18) ^(b)
Skin of whole body	7.5	10(N-18) ^(b)
Hands and forearms, feet and ankles	18.75	75 per year

1. These limits are based on presently available information and cannot be regarded as permanent.
2. Where N is age in years and is greater than 18.

7. Contamination. Is the spread of radioactive material to places where it may harm personnel or spoil experiments.

6.3 POLICY

1. It is the policy of all components in the Valley Forge Area to keep the ionizing radiation exposure of all personnel as low as possible and, in particular, below all existing federal, state and Company regulations.
2. All proposed uses of radioactive material or ionizing radiation-producing devices shall be reviewed and prior approval for use secured from the Ionizing Radiation Advisory Group (IRAG) consisting of:
3. All ionizing radiation machines and radioactive materials shall be used, stored, handled, transported, or disposed of in accordance with existing regulations (i. e., Atomic Energy Commission, Commonwealth of Pennsylvania, General Electric Company and the IRAG).

4. All ionizing radiation machines and radioactive materials shall be used only in the manner approved by the IRAG.
5. Accidents involving radioactive materials in which there is a possibility of ingestion or inhalation of radioactive material or severe body contamination shall be immediately reported to the members of the IRAG. Accidental exposures (actual or suspected) in excess of the quarterly limits stated above shall be immediately reported to the IRAG.
6. Where Atomic Energy Commission, or State of Pennsylvania Rules and Regulations may not necessarily apply, the Ionizing Radiation Advisory Group's activity will be guided by recommendations of such organizations as the National Committee on Radiation Protection and Measurement and also by Company recommendations, particularly where recommendations establishing lower levels of exposure are concerned.

6.4 RESPONSIBILITIES AND PROCEDURE

6.4.1 It is the responsibility of all personnel working with ionizing radiation to acquaint themselves with the regulations bearing on their duties and their responsibility with regard to ionizing radiation safety. In particular, each individual is responsible for:

1. Wearing the prescribed monitoring equipment (i. e., film badge, etc.) whenever working with radiation.
2. Using the recommended contamination control equipment as required and following contamination control procedures as required.
3. Keeping his exposure as low as possible by recommending improved procedures, etc., when applicable.
4. Observing and obeying all signs, tags, etc., posted by the Health Physicist.
5. Reporting conditions that are considered hazardous or may result in over-exposure.

6.4.2 Supervisors are responsible for the ionizing radiation safety of all personnel reporting to them. In particular, each supervisor is responsible for:

1. Assuring that each individual understands and follows all regulations regarding ionizing radiation safety.
2. Coordinating with the Health Physicist to obtain all necessary radiation safety advice and assistance.

3. Disposal of radioactive material in accordance with AEC and State of Pennsylvania regulations as set forth by the Health Physicist.

6.4.3 The manager of a component requiring radioisotopes or ionizing radiation-producing devices shall:

1. Submit a written request to the Chairman of the IRAG. The request shall include the following information:
 - a. Quantity, type and form of any radioisotopes to be used or description of ionizing radiation-producing equipment.
 - b. Name, title and biographical background of the individual responsible for the work to be performed.
 - c. Names, titles and biographical backgrounds of individuals who will work with the materials or equipment.
 - d. A general description of the work to be performed.
 - e. A specific description of the safety precautions to be taken. (Assistance in preparing this section may be obtained from the Health Physicist.)
2. Providing such information to the IRAG as it may require for periodic audits of the approved ionizing radiation program.
3. Not deviate from the approved program without the prior approval of the IRAG.

6.4.4 The IRAG will:

1. Accept or reject any proposed use of radioisotopes or ionizing radiation-producing equipment which in the Group's opinion does or does not adequately meet safety requirements set forth by the AEC, State of Pennsylvania (or other states as they may apply), General Electric Company and VFSC instructions. The group's authority is limited to the ionizing radiation safety criteria only.
2. Notify the requesting component manager of its decision, and supplement the safety requirements submitted when it feels the need to do so.
3. Perform such periodic audits and programs as it deems necessary.

6.4.5 The Manager Security and Administrative Services is responsible for:

1. Providing the overall administration of an effective ionizing radiation control program, health physics function, and insuring compliance with applicable regulations, reviewing and approving, prior to procurement or use, equipment specifically designed to produce ionizing radiation and radioactive materials.
2. Serving as Chairman of the Ionizing Radiation Advisory Group.
3. Obtaining from the Atomic Energy Commission, the Interstate Commerce Commission, and other authorized government agencies those licenses required to obtain and ship radioactive sources and register the licenses with the Commonwealth of Pennsylvania. (NOTE: AEC licenses will only be secured by the Chairman, IRAG as needed. In order to avoid unnecessary delays, advise him of needs well in advance of critical dates).

6.4.6 The Health Physicist is responsible for:

1. Serving as Secretary of the Ionizing Radiation Advisory Group.
2. Keeping records of IRAG activities and such other information as required by regulatory agencies.
3. Assisting supervisory personnel in the writing of all Ionizing Radiation Safety Requirements, and development of such information and training programs as may be required to assure proper handling of these materials.
4. Conducting such surveys, leakage tests, and environmental studies as may be required to insure the integrity of the program.
5. Insuring that suitable warning signs and devices are in place and operating as required in accordance with the regulations of the Department of Health, Commonwealth of Pennsylvania and the Atomic Energy Commission.
6. Developing and maintaining emergency procedures.
7. Investigating and preparing reports of all actual or suspected excessive or unauthorized exposure to ionizing radiation.

6.4.7 The Manager Medical Services is responsible for:

1. Determining the medical program to be followed by all employees involved in working with ionizing radiation.
2. Serving as a member of the IRAG.

6.4.8 All responsible supervisory personnel shall submit for review to the Health Physicist all Planning Sheets, MSI's, STP's or other applicable documents which set forth a program, process or procedure for working with or otherwise involving ionizing radiation.

6.4.9 The initiating manager shall secure the written approval of the Health Physicist prior to the purchase of any ionizing radiation-producing device or radioactive material. Procurement will not process a Material Request for these items unless it has been properly approved by the Health Physicist.

6.4.10 Production Control (or other applicable operation) will be responsible for determining the total quantity of radioactive material to be assigned to each operation and providing this information to the Chairman, IRAG.

6.4.11 All managers of components concerned with the handling, machining, reworking or testing of radioactive materials will be responsible for:

1. Posting the "Safety Requirement" provided by IRAG.
2. Obtaining the approval of the Health Physicist prior to performing any operation involving machining, melting, welding, heating, etc., any source of radiation.
3. Obtaining the approval of the Health Physicist prior to disposal of any sources of radiation.

6.4.12 RECEIVING AND SHIPPING

1. Receiving shall not release any radiation-producing devices without the written permission of the Health Physicist.
2. Shipping shall not ship or otherwise transport radioactive materials without the written permission of the Health Physicist, and then shall do so only in accordance with the current regulations of the ICC, AEC and/or other authoritative governmental agencies (federal, state or local).

6.4.13 The Accountant - Taxes, Insurance, and Royalties will ascertain that the Valley Forge Area has adequate insurance coverage for the radioactive sources in the Valley Forge Area.

6.4.14 Drafting - All drafting activities will be responsible for including the Health Physicist on a distribution list of all drawings which show the inclusion of radioactive materials, and they shall also note in bold lettering on the drawing, CAUTION: RADIOACTIVE MATERIAL.

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