

GENERAL  ELECTRIC  
COMPANY

VALLEY FORGE SPACE TECHNOLOGY CENTER (MAIL: P. O. BOX 8555 PHILA., PA. 19101) .. TEL. 962-2000

6-4-68  
MISSILE AND  
SPACE DIVISION

September 3, 1968

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

Dear Mr. Brinkman:

The enclosed application is a request to change Byproduct Material License 37-02006-05 to a broad license. General Electric Space Systems has fulfilled the criteria outlined in 10 CFR Part 33. The Ionizing Radiation Advisory Group has been functioning effectively for over a year and its policies and procedures are contained in the Mandatory Safety Procedure M-6 (Attachment #6). The radiological safety officer is R. O. McClintock whose resume is also attached. (Attachment #3).

If there are any questions regarding this application please contact me or the Radiological Safety Officer at your convenience.

Very truly yours,



Thomas P. Handley, Manager  
Security, Safety & Plant Protection

mlh

Enclosure

05153 E-6  
T25

Form AEC-313  
(8-64)  
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

Form approved.  
Budget Bureau No. 38-R027

**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.

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

**General Electric Company  
Space Systems  
Valley Forge Space Tech. Center  
P.O. Box 8555  
Philadelphia, Penna. 19101**

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

**See Attachment #1**

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

**Space Systems**

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

**37-02006-05**

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.)

**See Attachment #1**

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.)

**R. O. McClintock**

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

**See Attachment #2**

(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.)

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.)

**See Attachment #2**

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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	See Attachment #3		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			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 #3		

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 <sup>2</sup> )	USE (Monitoring, surveying, measuring)
See Attachment #4					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE. Instruments are calibrated in accordance with manufacturers specifications.

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

Quarterly film badge service supplied by R.S. Landauer, Jr. & Co.

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 #7

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 #5

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. Radiological Service Co. 50 Van Buren Road, Westwood, N.J.

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 9/3/68

By: GENERAL ELECTRIC Co  
Raked O. McClintock  
 Radiological Safety Officer



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

- 1b. A. Byproduct material may also be used at facilities of the licensee at Hangar AA, Cape Kennedy, Florida.
- B. Byproduct material may be used at the Cabot, Cabot and Forbes buildings Allendale Road and First Avenue, King of Prussia, Penna.
- C. Byproduct material may also be used at 3198 Chestnut Street, Phila., Penna. and King of Prussia Technology Center, King of Prussia, Penna.

4. 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, Safety & Plant Protection

Secretary: R. O. McClintock, Health Physicist

Members: R. J. Panaro, M.D., Physician  
S. Gottlieb, M.D., Manager, Medical Services

The minimum technical qualifications for supervisory personnel for radioactive materials include U.S. Department of Health Education and Welfare course in Basic Radiological Health or equivalent, supervisory responsibility at General Electric Company and past experience in handling radioactive materials.

*Called Mc. Clintock 9/17. ~~and~~ only sealed sources will be used at Cape. RJD*

Attachment #2

A. Any Byproduct Material with Atomic Nos. between 3 & 83	Sealed Sources	3 Ci Total
B. Any Byproduct Material with Atomic Nos. between 3 & 83	Sealed Sources	1 Ci Total
C. Any Byproduct Material with Atomic Nos. between 3 & 83	Any	0.1 Ci Total
D. Hydrogen 3	Any	35 Ci Total
E. Promethium 147	Sealed Sources	350 Ci Total
F. Promethium 147 (plus incidental contaminants)	Sealed Source (used ASMA source)	168,000 Ci Total
G. Strontium 90	Sealed Source (3M Microspheres Doubly Encapsulated in tubes)	10 Curies

Authorized Use

- A. Instrument calibration, evaluation of radiation effects and radiation research.
- B. Same as A
- C. Same as A
- D. Same as A
- E. Same as A
- F. Demonstration as a vacuum tube cathode heater
- G. Radiation effects studies

*Mc Clintock called 9/16 and requested deletion of F. The source has been returned  
to Battelle - rps*

Robert O. McClintock

EDUCATION:

- B. S. in Physics - College of William & Mary 1957
- M. S. in Radiological Physics - University of Rochester 1958  
(A.E.C. fellowship)

EXPERIENCE:

- 1958 - 1960 Health Physics Shift Engineer - Covered Health Physics activities during shift hours at the Westinghouse Testing Reactor. Was responsible for radiation and contamination surveys.
- 1960 - 1967 Health Physicist - Was responsible for all Health Physics activities at the Brookhaven Graphite Research Reactor and the High Flux Beam Reactor. Supervised staff of seven and was involved in waste disposal, environmental monitoring, tritium control and all other Health Physics activities.
- 1967 - Present Health Physicist - Responsible for all Health Physics activities at General Electric Missile and Space Division. Current projects include SNAP 19 and 27 Radiosotope Thermoelectric Generators.

Health Physics Certification - American Board of Health Physics 1966

## 8. Type of Training

a. University of Rochester and Brookhaven Nat'l Lab.

b. "

c. "

d. "

## 9. Experience With Radiation

Isotope	Max. Amount	Experience	Duration	Type of Use
m.f.p.		Brookhaven Nat'l Lab.	7 years	Fission product from Reactor fuel
Tritium	$10^3$ Ci	"	3 years	Reactor Coolant
all isotopes	C amounts	"	7 years	Activation product
Pu 238	>10,000 C	GE Co.	1 year	SNAP RTG
all isotopes	mc amounts	"	1 year	Isotope usage

ATTACHMENT #4

<u>Type of Instruments Make &amp; Model No.</u>	<u>Number Available</u>	<u>Radiation Detected</u>	<u>Sensitivity Range (mr/hr)</u>	<u>Window Thickness (mg/cm<sup>2</sup>)</u>	<u>Use Monitoring Surveying, Measuring</u>
- Eberline Instrument Corp. E-120	2	Beta Gamma	0 to 50 mr/hr	3-mg/cm <sup>2</sup>	Surveying
- Eberline PAC-4G	2	Alpha	0 to 5000,000 cpm	0.85 mg/cm <sup>2</sup>	Surveying
- Eberline 6112	2	Beta Gamma	0.1 to 1,000 r/hr	30 mg/cm <sup>2</sup>	Surveying
- Eberline Rm-12 A	1	Gamma	0 to 20 mr/hr	2 AMPEREX 90 NB-3 GM Tubes	Monitorin
- Eberline Rm-3C	2	Alpha Beta Gamma	0 to 50,000 cpm	0.85 mg/cm <sup>2</sup> 3.5 mg/cm <sup>2</sup>	Alpha Monitori Surveyin
- Eberline Pc6-4 Scaler Counter Sh-1 Sample Holder	1 1	Alpha Beta Gamma	0 to 999,999 cpm	0.85 mg/cm <sup>2</sup>	Measuring
- Eberline PNC-4	2	Fast and Slow Neutron	0 to 500,000 cpm		Surveying
- Nuclear Measurements Corp. Pc-3T	2	Alpha Beta Gamma	0 to 99,999,999 cpm	Windowless Gas Flow Counter	Measuring
- Staplex Co. T F I A	2	High Volume Air Sampler		60 CFM	
0- Eberline Inst. Corp. AIM-3	2	Alpha	0 to 1,000 cpm	1 mg/cm <sup>2</sup>	Monitori
1- Radeco, Inc. IC-221	1	Alpha	0 to 10,000 cpm	Solid State	Monitori



Type of Instruments		Attachment #4			Use
Make & Model No.	Number Available	Radiation Detected	Sensitivity Range (mr/hr)	Window Thickness (mg/cm <sup>2</sup> )	Monitoring Surveying Measuring
12- Texas Nuclear 9140	1	RBE Dose Neutron	0 to 1,000 mr/hr	4x8 mm Li <sup>6</sup> I (Eu) Crystal	Surveying
13- Eberline Inst. Corp. E-400	1	Beta Gamma	0 to 200 mr/hr	30 mg/cm <sup>2</sup>	Surveying
14- W. B. Johnson & Associates, Inc. GSM-5	2	Beta Gamma	0 to 20 mr/hr	30 mg/cm <sup>2</sup>	Surveying
15- Nuclear Measurements Corp. GS-3L	2	Beta Gamma	0 to 20 mr/hr	30 mg/cm <sup>2</sup>	Surveying
16- Mine Safety Appliance Co. 0-10 CFH	2	Personnel Air Samplers 0-10 CFH			Monitoring
17- Landsverk Electrometer Co. L-49 Dosimeters	12	Gamma & Neutron 0-200 mr/hr			
18- Landsverk L-15 Dosimeters	8	Gamma	0-5R/hr		
19- Landsverk L-50	30	Gamma	0-2-- mr/h		
20- Cambridge BM 20005/.2	12	Gamma	0-200 mr/h		
21- Nuclear Chicago 2500 Series	1	Beta Gamma	0-2.5 r/hr	1 mg/cm <sup>2</sup>	Surveying
22- Victoreen 440	1	Alpha Beta Gamma X-ray	0-300 mr/hr	1 mg/cm <sup>2</sup>	Surveying

ATTACHMENT #5

1. All programs involving radioactive materials must be approved by the Ionizing Radiation Advisory Group (IRAG) according to Mandatory Safety procedure M-6.
2. As part of the application for approval each user must specify a radiation protection program that will be used with his experiment. The IRAG will either approve the program, add to the procedures or disapprove the program.
3. All programs thus approved must be coordinated with the Health Physicist. He is responsible to the IRAG to assure the written safety procedures are followed. He is also responsible for carrying out all requirements of the Pennsylvania State Department of Health, the Atomic Energy Commission and General Electric Company regarding Radiation Safety.
4. The Health Physicist is also responsible for the following:
  - a) Radiation control including surveys and the film badge program.
  - b) Contamination control including leak tests.
  - c) Coordinating with other departments, etc. to assure proper radiation safety at every operation.
  - d) Training
  - e) Record keeping, inventories and other clerical requirements.
  - f) Waste disposal
  - g) Providing radiation safety advice and assistance.
  - h) Emergency procedures including dry runs.

## I. PURPOSE

To state the requirements that shall apply in the use of all radiation, radiation machines and radioactive materials to insure the maximum safety to all persons in the Division. 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.

## II. DEFINITIONS

- A. 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 ultraviolet light.
- B. Radiation Machine - any device that produces radiation when the associated control devices are energized.
- C. Radioactive Materials - any material (solid, liquid, or gas) that emits radiation spontaneously, for example: carbon-14, cesium-137, cobalt-60, radium, thorium, etc.
- D. Dose - in radiology, a dose of ionizing radiation is a quantity of radiation.
- E. Rem (Roentgen equivalent man) is the quantity of any type of atomic radiation which causes the same biological effect as one roentgen of X or gamma radiation.
- F. Permissible Limits for External Exposure
  1. Personnel who are occupationally exposed to radiation in programs that are conducted under AEC contracts will be governed by the limits specified in AEC Safety Manual Appendix O524 entitled, "Standards for Radiation Protection".
  2. 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.

### III. POLICY

- A. 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:

Manager, Security, Safety and Plant Protection

Manager, Health & Safety

Health Physicist, MSD (Secretary)

- B. All 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) and in such a manner that no person shall receive an excessive radiation dose therefrom.
- C. Radioactive materials shall be stored so as to minimize the probability of their being handled or tampered with by unqualified persons.
- D. In the case of a leaking source, spill, or similar accident in which there is a possibility of ingestion or inhalation of radioactive material or severe body contamination, the members of the IRAG shall be promptly called.
- E. No radioactive material shall be melted, welded, pickled, machined or otherwise worked except in accordance with written instructions obtained from the Health Physicist.
- F. Individuals handling or working with radioactive material or who may be exposed to radiation in the course of their employment shall be required to pass a physical examination and wear radiation monitoring devices supplied by the Health Physicist.
- G. Disposal of radioactive material, when required, shall be in accordance with Atomic Energy Commission, and/or State of Pennsylvania rules and regulations.

- H. Where Atomic Energy Commission, or State of Pennsylvania Rules and Regulations may not necessarily apply, the Advisory Group will be guided by recommendation 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.
- I. Emergency exposures of individuals will be made only after the approval of the IRAG has been secured.
- J. Accidental exposures (actual or suspected) in excess of the quarterly limits stated above shall be immediately reported to the members of the IRAG.

IV. RESPONSIBILITIES AND PROCEDURE

- A. The Manager of a component wanting to perform work which utilizes radioisotopes or ionizing radiation-producing devices shall submit a written request to the Chairman of the IRAG. The request shall include the following information:
  - 1. Quantity, type and form of any radioisotopes to be used or description of ionizing radiation-producing equipment.
  - 2. Name, title and biographical background of the individual who will be responsible for the work to be performed.
  - 3. Names, titles and biographical backgrounds of individuals who will work with the materials or equipment.
  - 4. A general description of the work to be performed.
  - 5. A specific description of the safety precautions to be taken.
- B. The IRAG will:
  - 1. Accept (or reject) any proposed use of radioisotopes or ionizing radiation-producing equipment which in the Group's opinion 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 Department Procedures. The Group's authority is limited to the safety criteria only.

2. Notify the requesting Component Manager of its decision and may supplement the safety requirements submitted when it feels the need to do so.

C. 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**

D. Purchasing, or the initiating manager, shall notify and secure the approval of the Health Physicist prior to the purchase of any radiation-producing device or radioactive material.

(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.)

E. Buyers assigned to purchase radioactive material or radiation machines will secure instructions from the manufacturer on the following subjects, as appropriate:

1. Recommended procedures during installation, normal use, shutdown and storage to protect personnel from excessive radiation.
2. Recommended procedures in the event of accident, fire or flood to minimize radiation hazards and radioactive contamination hazards to personnel.
3. A statement of the tested "safe life" for sealed sources.
4. Information on the resistance of the source to attack by corrosive materials.

NOTE: Sealed source containers should be provided by a manufacturer with a label stating: (a) CAUTION RADIOACTIVE MATERIAL, (b) the name or chemical symbol of the source and its activity, i.e., number

of curies, (c) the year of sealing, (d) name of manufacturer, (e) serial number, or type number in the case of small sources manufactured in large quantities, (f) standard radiation symbols and colors shall be used.

F. The Chairman, IRAG will be responsible for:

1. 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.
2. Assuring that supervisors have the necessary information to instruct new personnel in safe working practices.
3. Keeping records of all radioactive sources, to include:
  - a. Date of order.
  - b. Purchase Order number.
  - c. Identification or type of source.
  - d. Part number.
  - e. Vendor.
  - f. Number of pieces.
  - g. Weight per piece.
  - h. Total weight.
  - i. Location.
  - j. Amount and type of radioactive material.
  - k. Dose rate at a given distance.
4. Examining and inventorying incoming sources of radiation; tagging all radioactive material.

NOTE: A special tag will be prepared by the Health Physicist for radioactive material which can be safely handled. This tag will accompany the material through the plant. All radioactive material shall be labeled. CAUTION-

RADIOACTIVE MATERIAL, and this warning sign shall

always remain on the material while it is in the plant.

5. Seeing that written "Safety Requirements" are prepared so that the radiation exposure of each worker is kept to a minimum.
6. Assuring that individuals required to handle radioactive material in potentially toxic quantities wear adequate protective clothing and monitoring devices; maintaining records concerning the exposure of each individual.
7. Conducting radiation surveys, leakage tests, air and water sampling where required and keeping records on these surveys as indicated in the initial program.
8. Insuring that suitable warning signs and devices are in place and operating as required (or better) in accordance with the regulations of the Department of Health, Commonwealth of Pennsylvania and the Atomic Energy Commission.
9. Insuring that shielding, storage containers, and handling equipment are adequate and are maintained satisfactorily.
10. Maintaining up-to-date operating instructions for the radiation equipment.
11. Investigating each case of excessive or abnormal exposure to determine the cause and take steps to prevent a recurrence.
12. Planning and posting, in advance, "Safety Requirements" for coping with possible emergencies (i.e., fire, flood, source leakage, etc.) which might result in external overexposure of personnel or intake of radioactive materials.
13. Maintaining, preparing, and submitting all records, reports, and notifications required by the Atomic Energy Commission and the Department of Health, Commonwealth of Pennsylvania.



14. Informing the Speciality-Taxes, Insurance and Royalties of the procurement of each radioactive source.

G. The Manager, Health & Safety shall be responsible for:

1. Performing all necessary and required medical examinations; the intervals and extent to be determined by the Medical Physician.
2. Insuring the necessary related medical care for individuals in the program.

H. All planning components, Development Manufacturing, will include on all applicable "Planning Sheets" the following notation:

"This Planning Sheet has Radioactive Material; do not change sequence."

I. Production Control (or other applicable operation) will be responsible for:

1. Determining the total quantity of radioactive material to be assigned to each operation, and
2. Providing this information to the Chairman, IRAG.

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

1. Posting the "Safety Requirement" provided by the Chairman, 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.

K. Receiving and Shipping

1. Receiving shall not release any radioactive material or 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

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ICC, AEC and/or other authoritative governmental agencies (Federal, state or local).

L. The Accountant - Taxes, Insurance, and Royalties will:

1. Ascertain that the Department has adequate insurance coverage for the radioactive sources area.

M. Packaging Engineering (or other applicable operation) will:

1. Secure necessary shipping permits to insure compliance with ICC, CAB and USAF regulations in coordination with the Health Physicist.
2. Provide package design information sufficient to insure compliance with all existing regulation.

Attachment #7

The following is a description of the facilities currently used or planned to handle the radioactive materials listed in Attachment two.

- A, B - Sealed Sources - All sealed sources are used in standard laboratory rooms. The sources are stored either by the Health Physicist in his storage area or by the user in a locked, posted cabinet. Routine inventories and leak tests are taken at least every six months (every three months for alpha sources) by Health Physics. Routine radiation and contamination surveys are taken at least monthly by Health Physics and in most cases are taken at more frequent intervals by the user. All users are required to wear film badges.
- C Unsealed Sources - At the present time we are using very small quantities of unsealed sources on this license. Any future proposals for unsealed sources will be reviewed by the IRAG using guidelines stated in Attachment #8.
- D Hydrogen - 3 - Thirty curies of Hydrogen 3 will be used on the Nimbus D Spacecraft. Handling procedures are outlined on Attachment #10.
- The remaining five curies will be handled using methods and facilities outlined in AB and C depending on the source encapsulation. The IRAG will require Tritium Bioassays and air monitoring when required.
- E Pm 147 - (350 Curies) will be handled according to letters dated June 9, 1967 and July 6, 1967 signed by E. R. Harris.
- F Pm 147 - (168,000 Curies) will be handled according to the application dated June 11, 1968 signed by R. O. McClintock. The facilities, equipment and procedures outlined in this application are available for use for large sources.
- G Sr-90 (10 Curies) will be handled according to the application dated December 7, 1965 signed by J.H. Stricker.

05153

Attachment #8

The IRAG will follow the following guidelines when reviewing application for using unsealed sources. Their final recommendations will necessarily be governed by the quantity of radioactivity and experimental conditions:

- A) Radiation Control - All users of radioactive materials must wear a film badge. Health Physics will make periodic radiation surveys.
- B) Contamination Control - All users must have instrumentation capable of detecting personnel and surface contamination. Protective clothing, gloves etc. will be worn as required. Health Physics will make frequent contamination surveys.
- C) Airborne Contamination Control - The IRAG does not contemplate approving any programs that will allow routine airborne contamination. All such programs, or program with a potential for causing air contamination, will be controlled by hoods, dryboxes or proper ventillation. Specifications for the hoods will have an air velocity of 100 linear feet per minute and filtration of at least 99.97 percent.
- D) Emergency - All users will have an emergency plan similiar to the example in Attachment #9.
- E) Waste Disposal - A Radiologicals Inc. or equivalent waste container will be placed in all rooms using unsealed sources. All radiological wastes will be disposed in these containers. No contamination will be allowed out the exit air or sewer systems.
- F. Records - The users will be required to maintain daily logs to keep track of isotope usage, decay and disposal. Health Physics will inventory total quantities on a quarterly schedule.

Attachment #9

- A. An emergency is defined as a spread of radioactive material to places where it may harm persons or spoil experiments.
- B. The immediate response of all personnel in the area is to hold their breath and leave the area.
- C. The Health Physicist or Safety Office should be called for assistance.
- D. While waiting for assistance all involved personnel should:
  - a) Limit the release to the laboratory (i.e. close all doors and windows, turn off air conditioning, etc.)
  - b) Remain in one area to limit the spread of contamination.
- E. The Health Physicist or his designee will direct all subsequent operations. He will:
  - a) Survey the area and evaluate the extent of the emergency.
  - b) Survey all personnel involved.
  - c) Supervise decontamination of all personnel if necessary.
  - d) Supervise decontamination of the laboratory.
  - e) Notify, if necessary, General Electric management, the Atomic Energy Commission, and the State Department of Health.

Attachment #10

Thirty Curies of Hydrogen - 3 will be used on one program involving the Nimbus D Spacecraft. There will be six Tritium sources of five curies each. The sources will be a standard source model number SK1075 manufactured by American Atomic Corporation, 425 South Plummer Avenue, Tucson, Arizona and incorporated into a Beckman instrument. The purpose of the experiment is to determine spatial distribution of atmospheric ozone for atmosphere energy balance.

While at General Electric the sources will be under the control of the Health Physicist. Leak tests will be made upon arrival, at least once per week while the source is at General Electric and upon shipment. The sources will not be subjected to any destructive or hazardous test and will remain in a properly posted and controlled area.