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GENERAL ELECTRIC

SPACE DIVISION

GENERAL ELECTRIC COMPANY . . . . . VALLEY FORGE SPACE CENTER
(MAIL: P. O. BOX 8555, PHILADELPHIA, PENNSYLVANIA 19101), Phone (215) 962-2000

December 19, 1978

Mr. Bernard Singer, Chief
Radioisotopes Licensing Branch
Division of Fuel Cycle & Material Safety
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ref: File Code 90088

Dear Mr. Singer:

Enclosed is a revised application for renewal of license #37-02006-05 as a Type A specific license of broad scope. This application replaces those submitted on September 26, 1977 and April 3, 1978 and other correspondence. Items in this application are intended to be responsive to questions identified in (1) a letter of May 24, 1978 from Mr. Guinn of NRC, (2) a meeting of July 18, 1978 among Mr. Oesterling of GE and Messrs. Basson and Guinn and Ms. Trempe of NRC, and (3) an inspection at this facility by Mr. Slobodien on October 10, 1978.

The designation as broad scope is needed to assist this facility in meeting its commitments on Federal contracts. Due to the volatile nature of this business, the Division is required to respond to contractual needs in short time spans. The most cost-effective manner to operate the licensed programs is in the broad scope mode.

With regard to the tritium inventory, a purchase order has been initiated to dispose of nearly all of the quantity of tritium requested under the license. However, these quantities have been retained in this application in the event that the license should be approved prior to disposal.

Please contact me or the Radiation Safety Officer, Mr. R. G. Oesterling at 215-962-5926 if there are additional questions.

Sincerely,

Thomas P. Handley

Thomas P. Handley, Manager
Industrial Security, Safety
and Administrative Services

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encls:

COPIES SENT TO OFF. OF
INSPECTION AND ENFORCEMENT

ATTACHMENT #1

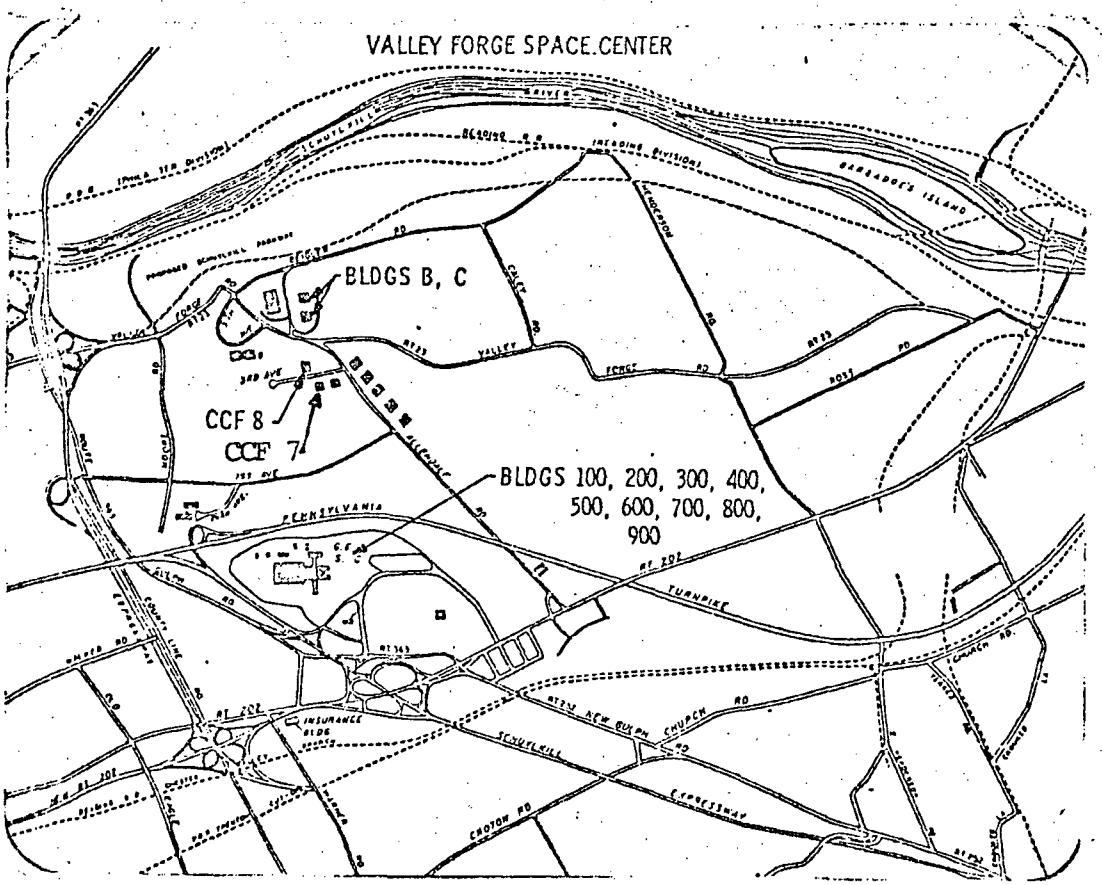
Locations of Use

A. The Space Division occupies several buildings in King of Prussia, PA as indicated on the map below. Some of these buildings are separated from the main complex by 2 to 3 road miles. Over the life of the license the Division may desire to vacate one or more of these buildings. In such an event, the occupancy of the vacated buildings would be reviewed by the IRAG to determine any needed surveys or decontamination. Given these circumstances, we believed it appropriate to designate the locations as Valley Forge Space Center facilities in King of Prussia, PA.

Since this designation appears to be too broad for licensing purposes, it is proposed that section 1(b) of form NRC-313 read as follows:

> Valley Forge Space Center, 260 Goddard Blvd., King of Prussia, Pa. and ancillary facilities on Allendale Road and on Third Avenue, King of Prussia, Pa.

This nomenclature is similar to that of the existing license with the addition of a specific address for the Division's Valley Forge area headquarters.



B. In addition, IRAG approvals under this license will contain either a specific expiration date or a requirement for IRAG approval prior to decommissioning a facility.

C. Please note that this license excludes activities performed by the Re-Entry and Environmental Systems Division (RESD) under separate license. RESD has facilities in the King of Prussia area and in the Valley Forge Space Center in addition to its facilities in Philadelphia. These facilities are not to be confused with Space Division facilities in King of Prussia. The Space Division has no NRC-licensed activities in Philadelphia.

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Certification of Authorization to Receive Radioactive Materials

Gentlemen:

This certifies that the Space Division, General Electric Company, is authorized to receive, possess and use the radioactive materials listed below, according to the provisions of license number _____ which expires _____.

Material	Form	Quantity

All radioactive materials are to be shipped to the attention of the undersigned at the following address:

General Electric Company
Valley Forge Space Center, Room M1138
Goddard Boulevard
King of Prussia, Pennsylvania 19101

R. G. Oesterling, C.H.P.
Health Physicist

Distribution: Original accompanies Purchase Order or sent to transferor
Copy #1 Health Physicist
Copy #2 RAM Requestor

ATTACHMENT #2

Ionizing Radiation Advisory Group

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A. Uses of radioactive material under this license will extend to those uses permitted by regulations and the license and approved by the Ionizing Radiation Advisory Group (IRAG). Administrative control is achieved through use of the attached procedure (Appendix A) #M-6, "Ionizing Radiation Control," of the Valley Forge Space Center Safety Manual.

Note: Procedure M-6 is currently under review. Revisions will include:

- o change "Health Physicist" to "Manager-Industrial Safety & Hygiene"
- o change "Atomic Energy Commission" and "AEC" to "Nuclear Regulatory Commission" and "NRC", respectively, where the context indicates licensing
- o change "Atomic Energy Commission" and "AEC" to "Department of Energy" and "DOE", respectively, where the contents clearly indicates activities exempt from NRC licensing and subject to DOE control.

B. The Valley Forge Space Center Safety Manual is established by Space Division Policy. Mandatory Procedure #M-6, "Ionizing Radiation Control" establishes policy for use of radioactive material in section 6.3 including authorities of the Ionizing Radiation Advisory Group, as abstracted below:

6.3 POLICY

6.3.1 It is the policy of all components in the Valley Forge Area to keep the ionizing radiation of all personnel as low as practicable and, in particular, below all existing federal, state and Company regulations.

6.3.2 All proposed uses of radioactive material or ionizing radiation-producing devices shall be reviewed and prior written approval for use secured from the Ionizing Radiation Advisory Group (IRAG) consisting of:

Chairman: Manager, Industrial Security, Safety & Administrative Services

Member: Manager, Medical Services

Secretary: Manager, Industrial Safety & Hygiene

6.3.3 All ionizing radiation machines and radioactive materials shall be used, stored, handled, transported, or disposed of in accordance with existing regulations and approvals (i.e., Nuclear Regulatory Commission, Commonwealth of Pennsylvania, General Electric Company and the IRAG).

6.3.4 The IRAG may revoke any approval it has issued when an investigation shows justification for such action. In such an event, the radiation user shall immediately relinquish all radioactive materials or ionizing producing devices to the Manager, Industrial Safety & Hygiene.

6.3.5 Accidents involving radioactive materials in which there is a possibility of ingestion or inhalation of radioactive material or body contamination shall be reported immediately 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.

Valley Forge Space Center Safety Manual

SUBJECT	CLASSIFICATION	ISSUED	NUMBER
IONIZING RADIATION CONTROL	MANDATORY PROCEDURE	JUNE 1974	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, Pennsylvania Department of Environmental Resources, U.S. Department of Labor, and the recommended practices of the General Electric Company.

6.2 DEFINITIONS

6.2.1 Ionizing Radiation

Gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared or ultraviolet light.

6.2.2 Ionizing Radiation Machine

Any device which produces ionizing radiation when the associated control devices are energized.

6.2.3 Radioactive Materials

Any material (solid, liquid, gas) which emits ionizing radiation spontaneously, for example: carbon-14, cesium-137, cobalt-60, radium, thorium, etc. Note: all compounds of uranium, thorium and radium and all general-licensed sources are included, whether labeled radioactive or not by the vendor.

6.2.3 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 or diagnosis.

6.2.5 Rem

The quantity of any type of ionizing radiation which causes the same biological effect as one roentgen of X or gamma radiation

6.2.6 Permissible Limits for External Exposure

1. 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."

2. Personnel who are occupationally exposed to radioactive materials licensed by the U.S. Atomic Energy Commission shall adhere to the provisions found in U.S. Code of Federal Regulations, Title 10, Part 20, "Radiation Protection."

3. Personnel who are occupationally exposed to other radioactive materials or to ionizing radiation machines shall be governed by the regulations found in 29 CFR 1910.96, "Occupational Safety and Health Standards - Ionizing Radiation," and in Pennsylvania Title 25, Part I, Subpart D, Article V, Chapter 227, "Standards for Control of Radiation Exposure."

4. Permissible Limits for External Exposure (a)

Part of Body	Dose per 13 Consecutive Weeks (rems	Accumulated Dose (rems
Whole body, head and truck blood forming organs, gonads, lens of eyes.	1.25 (b)	5(N-18)(c)
Skin of whole body	7.5	
Hands and forearms, feet and ankles	18.75	

(a) On AEC contracts exempt from licensing, the limits are slightly different. Contact the Health Physicist for information.

(b) If exposure history is documented and approved by Health Physics and Medical Services, 3.0 rems, but accumulated dose not to exceed 5(N-18) rems.

(c) Where N is age in years and is greater than 18.

5. Exposure to airborne radioactivity shall not exceed the concentrations listed in the applicable regulations without specific approval from the Health Physicist.

6.2.7 Contamination

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

6.3 POLICY

6.3.1 It is the policy of all components in the Valley Forge Area to keep the ionizing radiation of all personnel as low as practicable and, in particular, below all existing federal, state and Company regulations.

6.3.2 All proposed uses of radioactive material or ionizing radiation-producing devices shall be reviewed and prior written approval for use secured from the Ionizing Radiation Advisory Group (IRAG) consisting of:

Chairman: Manager, Industrial Security, Safety & Administrative Services

Member: Manager, Medical Services

Secretary: Health Physicist

6.3.3 All ionizing radiation machines and radioactive materials shall be used, stored, handled, transported, or disposed of in accordance with existing regulations and approvals (i.e., Atomic Energy Commission, Commonwealth of Pennsylvania, General Electric Company and the IRAG).

6.3.4 The IRAG may revoke any approval it has issued when an investigation shows justification for such action. In such event, the radiation user shall immediately relinquish all radioactive materials or ionizing radiation producing devices to the Health Physicist.

6.3.5 Accidents involving radioactive materials in which there is a possibility of ingestion or inhalation of radiactive material or body contamination shall be reported immediately 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.

6.3.6 Where the aforementioned rules or regulations may not necessarily apply, the Ionizing Radiation Advisory Group's activity will be guided by recommendations of organizations such 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 PROCEDURES

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 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. Not deviate from the approved program without the prior approval of the IRAG.

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 prior to performing any work on the requested program. The request shall include the following information:

   a. Quantity, type and form of any radioisotopes to be used or description or ionizing radiation-producing equipment.

   b. Name, title and radiation or radioactive materials experience of the individual responsible for the work to be performed.

   c. Names, title and radiation or radioactive materials experience of individuals who will work with the materials or equipment.

   d. A description of the work to be performed and facilities to be used.

   e. A specific description of the safety precautions to be taken and procedures to be followed. (Assistance in preparing this section may be obtained from the Health Physicist.)

2. Provide such information to the IRAG as it may require for periodic audits of the approved ionizing radiation program.

3. Assure that personnel under his direction shall not deviate from the approved program without the prior approval of the IRAG.

4. Follow all Safe Work Practices in this Manual, specifically those applicable to ionizing radiation.

5. Posting the safety requirements provided by IRAG.

6. Obtaining the approval of the Health Physicist prior to performing any operation involving machining, melting, welding, heating, or otherwise altering any source of radiation.

7. Deliver radioactive materials for disposal to the Health Physicist.

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 inspections as it deems necessary.

6.4.5 The Manager, Industrial Security, Safety and Administrative Services is responsible for:

1. Serving as Chairman of the Ionizing Radiation Advisory Group.

2. Providing the overall administration of an effective ionizing radiation control program and the health physics function; insuring compliance with applicable regulations; and reviewing and approving, prior to procurement or use, radioactive materials and equipment specifically designed to produce ionizing radiation.

3. Obtaining from the Atomic Energy Commission, the Interstate Commerce Commission, and other authorized government agencies those licenses required to obtain, possess, use and ship radioactive materials 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 IRAG prior to the purchase or other means of obtaining any ionizing radiation machine or radioactive material. The Purchasing component shall not complete a Purchase Order for these items unless it has been properly approved by the IRAG. (Also see Section 6.5.)

6.4.10 Each operation using radioactive materials shall maintain detailed records of all radioactive materials on hand. These records shall be readily available for

inspection by the Health Physicist. All radioactive materials not in use shall be relinquished to the Health Physicist for storage or disposal.

6.4.11 Receiving and Shipping shall:

1. Not release any radioactive materials or ionizing radiation-producing devices without the written approval of the Health Physicist. Procedures specified in Section 6.5.3 shall be followed.

2. Ship or transport radioactive materials only in accordance with Section 6.5.4 and applicable USAEC, DOT and state regulations.

6.4.12 The Accountant-Taxes, Insurance and Royalties will ascertain that adequate insurance coverage exists for possession and use of radioactive materials at Valley Forge area components.

6.4.13 Facilities Engineering shall obtain the approval of the Health Physicist on all drawings of ionizing radiation-producing devices, radioactive materials or facilities or devices to house or contain radiation devices or radioactive materials. All such drawings shall be labeled RADIATION DEVICE OR RADIOACTIVE MATERIALS in prominent lettering.

6.5 PROCURING, RECEIVING AND TRANSPORTING OF RADIOACTIVE MATERIALS

6.5.1 Licensees for radioactive materials are required to conform to several sets of regulations related to obtaining, receiving and transporting radioactive materials. Adherence to the procedures and requirements listed below is required to achieve compliance with the regulations. Where applicable, these procedures and requirements are amended to all SD-VF IRAG approvals.

6.5.2 Purchasing or Otherwise Obtaining Radioactive Materials

1. Each Material Request for radioactive materials shall bear the note: RADIOACTIVE.

2. All Purchase Orders for radioactive materials shall be forwarded to the Health Physicist for approval before any order, including by telephone or TWX, is placed.

3. In all other circumstances where radioactive materials are transferred into SD-VF facilities, e.g., a loaned source, return of a source from a customer, etc., the transferee shall obtain the approval of the Health Physicist before the transfer is initiated.

4. The Health Physicist shall complete the certification to receive radioactive materials (Figure 1) when necessary. The original shall accompany the Purchase Order when applicable, or be sent to the transferor in non-purchase transfers.

5. All radioactive materials shall be shipped to the attention of the Health Physicist, Bldg. 100.

6.5.3 Receiving Radioactive Materials

1. Receiving shall notify the Health Physicist, x5926 or x3130, immediately upon receipt of radioactive materials. Receiving shall not open any shipping container before the Health Physicist has completed the acceptance surveys.

2. The Health Physicist shall promptly survey the shipment, utilizing the following general procedure:

   a. Radiation and contamination survey of outer container.

   b. Radiation and contamination survey of inner container, if applicable.

   c. Leak test or radiation and contamination survey of the source, whichever is applicable, except unsealed sources.

3. In the event a leaking container is found, the carrier and USAEC Compliance, Region I, shall be notified immediately. The Health Physicist shall immediately take action to determine the extent of contamination in SD-VF facilities and decontaminate as needed.

6.5.4 Shipping or Transport of Radioactive Materials

1. Any person who plans to ship radioactive materials shall contact the Health Physicist at least three working days prior to the date of the shipment. The transferor shall supply to the Health Physicist the type, quantity and form of the material, the name and telephone number of the receiver, the type of container and the mode of transport. The Health Physicist shall contact the receiver to obtain his certification to receive radioactive materials.

2. Immediately prior to shipment, the Health Physicist shall survey the container(s), attach shipping labels and complete the shipping certification (Figure 2).

3. The Health Physicist shall be notified prior to any interplant transfers of radioactive material. USAEC or DOT approved shipping containers shall be used where applicable.

DIOACTIVE MATERIALS EXPERIENCE

4425

THOMAS P. HANDLEY, Manager
Industrial Security, Safety and Administrative Services

Education: Wentworth Institute
Boston, MA

(b)(6)

Numerous Company sponsored courses in Business Management, Safety for Supervisors, Computer Programming, Radiographic Course, Office of Civil Defense courses in Radiological Monitoring for Instructors. MHW Radiation Safety Course.

Experience:

1961 - 1963 Radiation Protection Officer, License Number 37-2006-05

1963 - 1965 Instructed Radiological Monitoring for PA Fallout Shelter Management Course at Penn State University

1968 - 1978 Chairman, Ionizing Radiation Advisory Group, License Number 37-2006-05 per Valley Forge Space Center Safety Manual Procedure M-6.0

RUDOLPH J. PANARO, M.D.
Manager, Medical Services

Education: University of Scranton (b)(6) -- Bachelor of Science
Temple University School of Medicine, 1956 -- Doctor of Medicine

Experience:

1957 - 1960 Battle Group Surgeon, U.S. Army, rank-Captain

1960 - present General Electric Co., Space Division
Physician and Medical Director

Currently Medical Director at the Valley Forge Space Center, King of Prussia. Responsibilities include medical surveillance of radiation workers and medical management of personnel suspected of being overexposed.

Member of the Ionizing Radiation Advisory Group since its inception.

Form AEC-313
(2-73)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R0027

4425

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: Materials Branch, Directorate of 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, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

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

GENERAL ELECTRIC COMPANY
Space Division
Valley Forge Space Center
P. O. Box 8555
Philadelphia, PA 19101

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

Valley Forge Space Center
260 Goddard Blvd. and ancillary
facilities on Allendale Road and
on Third Ave., King of Prussia, PA
(see Attachment #1)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Any authorized by
Ionizing Radiation Advisory Group

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

Renewal 37-02006-05
(Previous submittals 9/26/77 and 4/3/78)

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.)*

Any authorized by the Ionizing
Radiation Advisory Group.
(See Attachments #2 and #4)

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 G. Oesterling,
Certified Health Physicist
(See Attachment #3)

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*	(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.)*	
1) Any byproduct mat'l with aromic numbers 3 to 83, inclusive and except Sr90.	1) Sealed sources	(1) 40 curies not to exceed 1 curie per source
2) Any byproduct mat'l with atomic numbers 3 to 83, inclusive and except Kr85.	2) Any form	(2) 5 curies not to exceed 0.5 curie per nuclide
3) Strontium-90	3) Sealed source	(3) 10 curies
4) Krypton-85	4) Any form	(4) 45 curies
5) Hydrogen-3	5) Sealed sources	(5) 30 curies
6) Hydrogen-3	6) Any form	(6) 5 curies
7) Polonium-210	7) Sealed sources	(7) 0.5 curies
8) Polonium-210	8) Any form	(8) 0.1 curie
9) Americium-241	9) Sealed sources	(9) 3 curies

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 10CFR Part 30 and as authorized by the
Ionizing Radiation Advisory Group.
(see Attachments #2 and #11)

(Continued on reverse side)

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 ATTACHMENTS #3 and #4		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 ATTACHMENTS #3 and #4		

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/cm²)	USE (Monitoring, surveying, measuring)
		SEE ATTACHMENT #5			

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

See Attachment #6

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

Film or TLD badges as supplied by commercial vendors such as, but not limited to, Teledyne, Eberline, R. S. Landauer, Nuclear-Chicago, etc. Processing as needed from commercial vendors. Also see Attachment #7.

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 #8

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 Attachments #1, 2, 3, 4, 7, 8, and 9

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.

Teledyne Isotopes, see Attach.#10

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.

License Fee Category $ 3K

Fee Enclosed $ renewal

(Original 9/26/77)

Date December 19, 1978

Thomas P. Handley

Applicant named in item 1

By: Thomas P. Handley

Manager, Industrial Security, Safety and Administrative Services

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.

☆ U.S. GPO: 1973—543-126/515

RADIOACTIVE MATERIALS EXPERIENCE

RICHARD G. OESTERLING, MANAGER-INDUSTRIAL SAFETY & HYGIENE

Education

B.S. (General Studies), Eastern Oregon College, (b)(6) 64 6

Numerous Company-sponsored courses in manufacturing management, Fortran programming, criticality control, noise control and nuclear criticality safety. Health Physics Society sponsored courses in certification preparation. Office of Civil Defense courses in radiological monitoring for instructors and industrial civil defense management.

Experience

Certified in Health Physics by American Board of Health Physics, 1970

1963 to 1965 — Engineer - Radiation Monitoring, Redox Facility, Hanford
Responsible for providing health physics advice and assistance to the operating components of a nuclear fuel reprocessing facility and associated analytical laboratory, a kilocurie research laboratory, a decontamination facility for large radioactive equipment, a uranium oxide calcination facility, high-level waste storage facilities and radioactive waste burial sites.
Participated directly in decontamination and recovery operations following fire in a plutonium concentration facility.

1965 to 1966 — Supervisor - Radiation Monitoring, Redox Facility, Hanford
Directed a staff of 14 health physics technicians in performing radiation and contamination surveys and effluent monitoring for the facilities listed under the previous position. Served as technical liaison with other Hanford components, particularly instrument development group. Provided direct health physics consultation to the operating components of the above listed groups and a plutonium metal fabrication facility.

1966 to 1968 — Engineer - Nuclear Safety Technology, N-Reactor, Hanford
Responsible for (1) auditing the radiation safety performance of the operating components of a large nuclear power and production reactor and a uranium fuel fabrication facility; (2) providing technical health physics support for these components; (3) serving as technical liaison with groups contracted to perform studies of site geology, hydrology and micrometeorology and studies of fuel failure modes; (4) performing or directing investigations of actual or postulated releases of radioactive materials or chemicals to the environment; (5) performing radiation shielding anayles; and (6) participating directly in assorted projects such as decontamination of reactor piping and heat exchangers, effluent monitoring and containing an oil spill to the adjacent river.

1968 to 1969 — Engineer - Nuclear Safety, Vallecitos Nuclear Center
(1) Supervised a staff of six (6) at a test reactor; (2) provided health physics support to operating components; (3) performed neutron and gamma shielding analyses; (4) directed the enviromental monitoring program; (5) participated in safety reviews and criticality analyses.

ATTACHMENT #4

Designation and Training of Individual Users

A. The requirements for experience or instruction of individual users vary somewhat with the proposed use. A prospective user is expected to have, or is imparted, knowledge of the subjects listed below at a level commensurate with the proposed use.

1. Biological effects of radiation or radioactive materials.

2. Regulatory requirements and license conditions related to the proposed use, with specific instructions regarding observation of these requirements and reporting of potential violations.

3. Specific methods to minimize exposure with emphasis on engineered controls.

4. Emergency procedures and responses to warning systems.

5. Reports available to employees and method for obtaining reports.

B. Personnel with prior experience similar to the proposed use are normally considered qualified by the IRAG. Personnel without the required experience are instructed in the subjects in "A" above as needed to perform the proposed use safely. The instructor normally is the Radiation Safety Officer. However, with IRAG approval, the vendors of certain specialized equipment have provided this instruction as part of an overall training package.

C. The competence of the user is verified by various methods. The most common in this facility is use under the supervision of an authorized user. The authorized user then certifies to the IRAG that the new user has the capability to perform the required work safely. Much less frequent are observation during use or oral tests administered by the Radiation Safety Officer. A written test is seldom used. When written test are used, they are normally incorporated into a test of overall operation.

ATTACHMENT #5

Type of Instruments Make & Model Name	Number Available	Radiation Detected	Sensitivity Range (mr/hr)	Window Thickness (mg/cm^2)	Use Monitoring Surveying Measuring
Eberline Instrument Corp. E-120	1	Beta Gamma	0 to 50 mR/hr 0 to 70000 cpm	30 mg/cm^2	Surveying
Eberline PAC-4G	1	Alpha	0 to 5000,000 cpm	0.85 mg/cm^2	Surveying
Eberline 6112	1	Beta Gamma	0.1 to 1,000 R/hr	30 mg/cm^2	Surveying
Eberline Rm-12A	1	Gamma	0 to 20 mR/hr	2 AMPEREX 90 NB-3 GM Tubes	Monitoring
Eberline Rm-3C	1	Alpha Beta Gamma	0 to 50,000 cpm	0.85 mg/cm^2 Alpha 3.5 mg/cm^2	Monitoring Surveying
Eberline Pc6-4 Scaler Counter Sh-1 Sample Holder	1 1	Alpha Beta Gamma	0 to 999,999 counts	0.85 mg/cm^2	Measuring
Nuclear Measurements Corp. Pc-3T	2	Alpha Beta Gamma	0 to 99,999,999 counts	Windowless Gas Flow Counter	Measuring
Staplex Co. T F I A	2	High Volume Air Sampler		60 CFM	Sampling
Eberline Inst. Corp. AIM-3	1	Alpha	0 to 1,000 cpm	1 mg/cm^2	Monitoring
Rade Co.	Mod. 330 - 1 Mod. 440 - 1 Mod. 441 - 1	Alpha	0 to 5000 cpm	Semi-conductor	Monitoring

Type of Instruments Make & Model Name	Number Available	Radiation Detected	Sensitivity Range (mr/hr)	Window Thickness (mg/cm^2)	Use Monitoring Surveying, Measuring
Texas Nuclear 9140	1	Neutron Rem Meter	0 to 1,000 m rem/hr	4x8 mm Li^6I (Eu) Crystal	Surveying
W. B. Johnson & Associates, Inc. GSM-5	2	Beta Gamma	0 to 20 mR/hr	30 mg/cm^2	Surveying
Victoreen 440	1	Alpha Beta Gamma X-ray	0-300 mR/hr	1 mg/cm^2	Surveying
Eberline RO-1	1	Beta Gamma X-ray	0-5000 R/hr 0-5000 mR	1 mg/cm^2	Surveying Monitoring
Pocket Self-reading dosimeters Victoreen and Landsverk	20	Gamma	0-200 mR		Monitoring
Eberline Alpha-3	2	Alpha	0-5000 cpm	Semi-Conductor	Monitoring

ATTACHMENT #6

Calibration

A. Instrument type: gamma dose rate meters
Method: Exposure to source of known intensity at various distances. Two-point calibration on each range, limited by source strength. Current sources limit calibration levels to approximately one R per hour.
Sources: Cs137, 100 millicuries or Co60, 30 millicuries, both corrected for decay
Frequency: Semi-annually and after maintenance

B. Instrument type: portable contamination meters
Method: Exposure to source(s) of known strength(s)
Sources: Alpha emitters - plutonium plated disc sources
Beta emitters - Cl4, Co60, Cl 36, - Sr90/Y90 sources depending on the energy range desired with source strength corrected for decay as needed.
Frequency: Semi-annually and after maintenance

C. Instrument type: laboratory counting systems
Method: Source check with known source of appropriate radiation type prior to each use. Where appropriate, determination of counting plateau and counting efficiencies semiannually and after maintenance.
Frequency: As stated

D. Instrument type: Airborne activity monitors
Method: Calibration of meter response with electronic pulser. Determination of counting efficiencies with known sources.
Frequency: Semi-annually and after maintenance.

E. Calibrations are normally performed by, or under the direction of, the Radiation Safety Officer. When an instrument is returned to the manufacturer or sent to a facility which specializes in radiation protection instrumentation repair, calibration is normally requested as part of the repair service.

ATTACHMENT #7

Dosimetry

A. Personnel who are required to be monitored pursuant to 10CFR 20.202 are assigned a TLD or film badge. The vendor may be any one of those listed under item #12 or any other supplier with high quality and accuracy of service. The normal badge exchange frequency is quarterly. More frequent exchanges would be used if warranted. For example, highly variable dose rates to personnel or dose rates above three rems per year would warrant a monthly or more frequent exchange. Currently, there is no need for badge exchanges more frequent than quarterly.

Self-reading pocket dosimeters are used only to supplement the badge. The need for pocket dosimeters is very rare for licensed activities. Pocket dosimeter readings are not used for record purposes under licensed activities.

B. The IRAG does not countemplate approving programs which would require respiratory protection or routine use of bioassay. Control of exposure to unsealed radioactive materials is achieved through engineered controls. The need for bioassay is therefore limited to accident or emergency situations. Bioassay would, for example, be required in the event an emergency entry is made to clean up a contamination spill outside a hood or glove box. Another example is the situation where an employee is found to be contaminated on the face or head.

Bioassay is not required for tritium since the entire inventory is in storage, with the major part awaiting disposal. In the event work with unsealed tritium is required, the "Guidelines for Bioassay Requirements for Tritium" will be used as a guide.

Bioassay, when needed, is performed by commercial vendors. Vendors which may be used include Eberline Co., Teledyne Isotopes, Radiation Management Corp., Helgeson Nuclear Services or others depending on the specific isotope to be assayed and the vendor's detection capabilities.

6.3.6 Where the aforementioned rules or regulations may not necessarily apply, the Ionizing Radiation Advisory Group's activity will be guided by recommendations of organizations such as the National Committee on Radiation Protection and Measurement and also by Company recommendations, particularly where recommendations establishing lower levels of exposure are concerned.

C. The composition of the Ionizing Radiation Advisory Group currently is:

Chairman: Thomas P. Handley, Manager-Industrial Security, Safety & Administrative Services
Secretary: Richard G. Oesterling, C.H.P., Manager-Industrial Safety & Hygiene
Member: Rudolph J. Panaro, M.D., Manager-Medical Services

Their qualifications are listed in Appendix B and Attachment #3.

D. Technical control of potential radiation hazards will be achieved through application of criteria such as those found in the American National Standards and the Recommendations of the International Commission on Radiological Protection. The specific control measures adopted will be commensurate with the potential hazard.

The IRAG does not contemplate approving programs which require respiratory protection or generate significant intentional exposure to radioactive aerosols other than noble gases. Uses which may intentionally release radioactive materials to the environment in excess of those limits specified in 10CFR 20.106 will not be approved by the IRAG.

ATTACHMENT #8

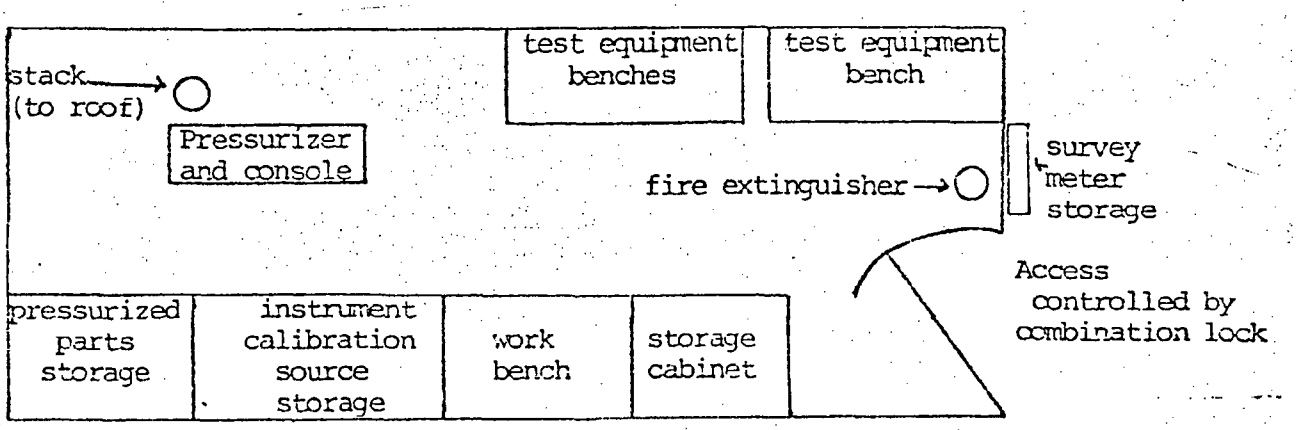
Facilities

A. The Valley Forge Space Center has fume hoods, glove boxes, high-efficiency filtration systems and other equipment utilized for the control of radioactive materials. The IRAG may require the use of any existing facility and require new facilities and modifications of facilities in order to maintain personnel exposure levels as low as practicable. The IRAG utilizes the criteria found in various recommendations of national and international groups and regulatory guides to determine the facility requirements for a particular use.

B. Most work with radioactive materials currently is with submillicurie quantities of sealed sources. These sources are required to be stored in a locked area when not in use. Radiation levels are controlled by the use of shielding, tongs, etc. Larger sources are normally purchased with self-contained shielding.

C. The only highly hazardous material handled in unsealed form currently is polonium-210. Unsealed materials in this hazard category are handled in glove boxes with HEPA filtration. Other unsealed materials, except noble gases, are used in fume hoods or similar facilities with HEPA filtration.

D. In the meeting of July 18, 1978, it was indicated that a sketch of one example of a facility would be a sufficient response. The sketch below is of a facility for leak-testing electronic components using a Trio-Tech (TM) pressurization device. The sketch is not to scale. This facility utilizes approximately 12 curies of Kr85.



The exhaust system is on uninterruptible power. The exhaust stack terminates at 1.3 times the building height as recommended by the ACGIH. The stack monitor and exhaust flow alarm in the Plant Protection Center.

ATTACHMENT #9

Radiation Protection Program

4425

A. Radiation Safety Committee

The radiation safety committee at Valley Forge Space Center is the Ionizing Radiation Advisory Group (IRAG). The IRAG's functions, members and their qualifications, responsibilities and procedures are delineated in Attachments #2 and #3.

The IRAG meets to consider each application for use of radioactive materials. This arrangement has been adopted due to the small number of users and the low frequency of applications.

B. Radiation Safety Officer

The duties and responsibilities of the Radiation Safety Officer are delineated in Attachment #2, Appendix A. The list is abstracted as follows:

6.4.6 The Radiation Safety Officer 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 Department of Energy.

6. Developing and maintaining emergency procedures.

7. Investigating and preparing reports of all actual or suspected excessive or unauthorized exposure to ionizing radiation.

C. Radiation Protection Procedures

1. Specific Procedures

The general radiation protection procedures are found in Attachment #2, appendix A. In addition, specific procedures and responsibilities are established as needed for each application. Specific procedures include:

(1) definition of responsible individual
(2) definition of authorized personnel
(3) access control, if required
(4) storage and handling requirements
(5) inventory control requirements
(6) emergency procedures, as required
(7) specialized facility requirements, if necessary

2. Emergency Procedures

Emergency procedures are established as appropriate to each application. These procedures supplement the general emergency plan in effect for the Space Center.

The basic instruction for all employees to report any emergency is to telephone the Plant Protection Center by dialing the emergency number (A-FIRE, 2-3473). Personnel in the Protection Center are given standing orders for contacting various personnel according to the type of emergency.

Personnel who work with radioactive materials are instructed in specific actions to be taken in the event of an emergency involving radioactive materials. Included are such items as fires, spills, monitor alarms and missing sources.

In addition, the plant Fire Brigade receives general instruction regarding fighting fires involving radioactive or other toxic materials.

3. Source Inventory and Leakage Testing

A semiannual inventory is made by physically locating sealed sources and verifying quantities of unsealed sources. The attached "Source History" form (Appendix A) is used. Entries to this form are at changes only. That is, the semiannual inventories aren't recorded unless a change in location is determined.

Leakage tests on sealed sources are performed for those sources and at the frequency indicated in the current license. The test normally consist of a wipe of the source with moistened paper followed, after drying, by counting in in a windowless flow counter. Tongs, etc. are used as required.

Leaking sources are normally disposed to radioactive waste. Arrangements may be made with the original supplier to return a source when required.

4. Contamination Control and Usage of Unsealed Byproduct Material

The usage of unsealed byproduct material, other than noble gases, has been very limited. Ordinary use periods are in the range of a few days to a few weeks. Since this work is normally performed in a hood or glove box, the practice has been to limit contamination levels outside the hood or box to nondetectable with portable instrumentation. Levels in the hood or glove box have been limited to those necessary to minimize spread of contamination. At the end of the use period, equipment and facilities have been decontaminated to nondetectable levels before release to unrestricted areas. The detection limit for the portable instrumentation in use is approximately 30-50 dis/min. On large surfaces, wipes with an area of approximately 1000 cm^2 are taken. Any equipment which is internally contaminated is tagged as radioactive material.

Personnel working with unsealed radioactive materials are required to make frequent surveys during the course of a work day using standard, accepted techniques. The Radiation Safety Officer or his delegate makes daily record surveys in areas where unsealed materials, other than noble gases, are in use. Standard good practices such as surveying and/or bagging materials removed from the hood or glove box and frequently surveying the hands, arms and front of the body are used.

The Radiation Safety Officer or his delegate surveys equipment with a history of contamination prior to disassembly or removal. Where practicable the equipment is decontaminated. Where decontamination is not practicable or removable contamination remains, a restricted area is set up and the work performed under the direction of the Radiation Safety Officer.

Air monitoring or sampling is performed for any work with quantities of unsealed byproduct material which exceeds the values in 10 CFR 30.71. Bioassay criteria are found in Attachment #7.

The basic approach of the IRAG to work with unsealed radioactive material is to require engineered controls such that personnel exposure will be minimized and the need for bioassay limited to emergency situations. The primary criteria are the linear flow velocity at the front of hood faces and the differential pressure between a room and the interior of a glove box. The specification for hood faces is 100 feet/min as checked with a velometer. Glove boxes are maintained at negative 0.2 to 0.5 inches water gauge with respect to the surrounding room.

Attachment #8, "Facilities" also addresses engineered control methods.

ATTACHMENT #9, APPENDIX A

SOURCE HISTORY

License #	Space Div. Source #	Date Received
Isotope(s)	Activity	

FORM: ☐ Sealed ☐ Unsealed: ☐ Solid ☐ Liquid ☐ Gas

LEAKAGE TESTS

Date						
Activity (uCi)						
By						
Date						
Activity (uCi)						
By						

ASSIGNED TO: User	Location	Date	ASSIGNED TO: User	Location	Date

Disposed To	License of Receiver	Date
Reason		

ATTACHMENT #10

WASTE DISPOSAL

Solid waste and liquid waste are transferred to Teledyne Isotopes for disposal. In between pick ups, the waste is stored in the waste drum located in the radiation vault. Loose or contaminated materials are bagged before placing in the waste drum. Liquids are in tightly closed plastic or metal containers or sorbed into solid material. Containers of liquids are packed in an outer container with sufficient sorbent material to retain the entire volume of liquid.

ATTACHMENT #11

Additional Items

4425

A. Request to Release Krypton-85 to the environment at $1x10^{-5}$ uCi/ml

During the meeting of July 18, 1978, it was indicated that Krypton-85 may be released to the environment at an annual average concentration of up to $1x10^{-5}$ uCi/ml with no need for micrometeorological data or determining effluent pathways. An increased release rate for venting of Kr85 from leak test facilities is requested. The Space Center, on Goddard Blvd., is equipped with two exhaust stacks which terminate at a height of approximately 64 feet above grade, which is slightly greater than 1.3 times the height of the building. Grade level is above the surrounding terrain. The nearest residence is further than one-half mile. No site micrometeorological data have been taken. The total flow rate of both exhausts is 860 ft^3/min. The quantity emitted during one year at a concentration of $1x10^{-5}$ uCi/ml would be 128 curies. This value is greater than the anticipated annual requirements.

B. Request to Fabricate Sealed Sources for Use on Premises

A high-integrity and high-intensity alpha-emitting source is required to perform certain tests on spacecraft. A detailed search of manufacturers indicated no source which is commercially available will meet the specifications. A condition to this license is requested to continue the existing amendment according to the details listed below:

1. Radionuclide: polonium-210
2. Chemical/Physical form: any
3. Maximum quantity: 0.1 curie
4. Purpose: Fabrication of sealed sources for research and development. Sources of the design required are not available through commercial vendors.
5. Facilities: Glove box equipped with high efficiency filtration and air lock.
6. Radiation Protection: The air in the vicinity operation will be monitored continuously during operations with a energy-resolving alpha air monitor capable of detecting a concentration of 200 pCi/m^3 in one minute. Equipment and room surfaces will be surveyed frequently for alpha emitter contamination.
7. Description of Operations: Generally-licensed sources as supplied by the 3M company will be disassembled and remounted in a licensee fabricated source holder. The source is epoxied into place then covered with an aluminum window thin enough to transmit a majority of the alpha radiation.

Following assembly, the source is cleaned, passed out from the glove box, and surveyed for alpha contamination.

GENERAL ELECTRIC
SPACE DIVISION
VALLEY FORGE SPACE CENTER
P. O. BOX 8555, PHILA., PA.

SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS

☐ AIR TRANSPORT ONLY	THIS IS TO CERTIFY THAT THE CONTENTS OF THIS CONSIGNMENT ARE PROPERLY DESCRIBED BY NAME AND ARE PACKED, MARKED AND LABELED AND ARE IN PROPER CONDITION FOR CARRIAGE BY AIR ACCORDING TO ALL APPLICABLE CARRIER AND GOVERNMENTAL REGULATIONS. (INTERNATIONAL SHIPMENTS ADD, AND TO THE IATA RESTRICTED ARTICLES REGULATIONS.) THIS CONSIGNMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR PASSENGER/CARGO (CROSS OUT ONE) CARRYING AIRCRAFT.
☐ SUFACE TRANSPORT ONLY	THIS IS TO CERTIFY THAT THE HEREON NAMED ARTICLES ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MAKKED, AND LABELED AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

NAME AND ADDRESS OF SHIPPER OR HIS AUTHORIZED AGENT_____

_____

_____
(SIGNATURE)

NATURE AND QUANTITY OF CONTENT				PACKAGE		
RADIONUCLIDE	GROUP	FORM	ACTIVITY	CATEGORY	TRANSPORT INDEX	TYPE
NAME OF PRINCIPAL RADIOACTIVE CONTENT	GROUP NUMBER OF GROUPS I TO VII	EITHER CHEMICAL FORM PLUS GAS/ LIQUID/SOLID, OR SPECIAL FORM OR ENCAPSULATION	NUMBER OF CURIES OR MILLICURIES SPECIFIED	I – WHITE OR II – YELLOW OR III – YELLOW LABEL	FOR YELLOW LABEL CATEGORY ONLY	INDUSTRIAL OR TYPE A, OR TYPE B

SAMPLE

ADDITIONAL INFORMATION REQUIRED FOR FISSILE MATERIALS ONLY

EXEMPTED FROM THE ADDITIONAL REQUIREMENT FOR FISSILE MATERIALS

NOT EXEMPTED
FISSILE CLASS I ☐
FISSILE CLASS II ☐
FISSILE CLASS III ☐

NAMES, PLUS QUANTITY IN GRAMS, OR CONCENTRATION OR ENRICHMENT IN USE

ADDITIONAL CERTIFICATION OBTAINED BY THE SHIPPER WHEN NECESSARY:

- SPECIAL FORM ENCAPSULATION CERTIFICATE(S) ☐
- TYPE B PACKAGING CERTIFICATE(S) ☐
- CERTIFICATE(S) FOR FISSILE MATERIAL ☐
- GOVERNMENT APPROVALS/PERMITS ☐

RADIATION LEVELS: SURFACE_____ MREM/HR: THREE FEET_____ MREM/HR: ONE METER_____ MREM/HR

CONTAMINATION LEVELS: ALPHA_____ DPM/100 CM^2: BETA-GAMMA _____ DPM/100 CM^2

APPROVED FOR SHIPMENT_____
(SIGNATURE OF HEALTH PHYSICS)

Distribution: Original and 1 copy; Copy 1 - Traffic; Copy 2 - Health Physics

M-6-10

1969 to 1973 — Manager - Plant Safety, Midwest Fuel Recovery Plant
Responsible for developing and administrating the radiation and industrial safety programs for a new nuclear fuel reprocessing plant. Specific areas included: (1) emergency plan, (2) environmental monitoring, (3) effluent monitoring, (4) personnel training, including training of health physics technicians, (5) procurement of instrumentation and equipment and equipment design and (7) supervision of a staff of six (6).

1973 to 1977 — Health Physicist, Valley Forge Space Center
Administered the radiation protection and licensing program for a major aerospace facility. Responsible for licenses which include byproduct, source and special nuclear material. Managed the radiation protection program to assemble and test Pu 238 fueled generators under an ERDA contract.

1977 to date — Manager - Industrial Safety & Hygiene, Valley Forge Space Center
Responsible for managing the occupational safety, industrial hygiene, fire protection and radiation protection programs for a large aerospace manufacturing and research and development facility. Staff includes a Safety Engineer and Fire Chief.

Types of Training	Where trained	Duration of training	On the Job?	Formal Course?
Principles & Practices of Radiation Protection	Eastern Oregon College/General Electric Co.	8 years	Yes	Yes
Radioactivity Measurement Standardization and Monitoring Techniques and Instruments	Eastern Oregon College General Electric Co.	8 years	Yes	Yes
Mathematics and Calculations Basic to the use and measurement of Radioactivity	Eastern Oregon College General Electric Co.	8 years	Yes	Yes
Biological Effects of Radiation	Eastern Oregon College General Electric Co.	8 years	Yes	Yes

Experience with Radiation

Isotope	Max. Amount	Location	Duration	Type of Use
Mixed fission products	megacuries	Redox, N-Reactor Vallecitos, MFRP	8 years	Reprocessing, resea and in reactor fuel
Plutonium	100 kilograms	Redox facility & Vallecitos	4 years	Reprocessing, resea
Uranium unenriched	metric tons	Redox facility & Midwest Fuel Recovery Plant	4 years	Calcination, MFRP cold runs
Polonium - 210	100 curies	Redox facility	3 months	Recovery research
Promethium isotopes	100 curies	Redox facility	6 months	Separations researc

Radioactive Materials Experience — Richard G. Oesterling

Experience with Radiation ... continued

Isotope	Max. Amount	Location	Duration	Type of Use
Cobalt - 60	kilocuries	N-Reactor, Vallecitos, Valley Forge	3 years	Source production, activation product, gamma irradiation
Tritium	megacuries	N-Reactor	1½ years	Production
Activation products	curies	N-Reactor, Vallecitos	3 years	Reactor coolant
Uranium, slightly enriched	metric tons	N-Reactor	1½ years	Fuel fabrication
Mixed fission products	10 curies	N-Reactor	1½ years	Fuel failure research
Radioactive noblegases	1 curie	Vallecitos	3 months	Calibration
Cobalt - 60	30 millicuries	Washington State, Illinois State, Valley Forge	8 years	Civil Defense instruction, calibration source
Various	generally licensed	Eastern Oregon College	6 months	Education
Radium	1 milligram	Eastern Oregon College	3 months	Education
Plutonium beryllium	10 curies	Vallecitos MFRP	2½ years	Neutron source
Americium beryllium-curium	100 curies	Vallecitos	6 months	Neutron source
Plutonium 238	300,000 curies	Valley Forge	4 years	RTG fuel
Strontium - 90	10 curies	Valley Forge	4 years	irradiation source
Various	0.5 curies	Valley Forge	4 years	research & developme