

# GENERAL ELECTRIC

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

SPACE SYSTEMS DIVISION

August 2, 1982

U. S. Nuclear Regulatory Commission  
Office of Nuclear Material  
Safety & Safeguards  
Division of Fuel Cycle & Material Safety  
Washington, D. C. 20555



Dear Sirs:

Enclosed is an application for renewal of License No. 37-02006-09  
(Expiration date: August 31, 1982; Docket or Reference No. 37-02006-05;  
Control No. 04-101). A check in the amount of \$150.00, which we understand  
to be the proper fee, is also enclosed.

Please contact the undersigned if there are any questions concerning this  
application for license renewal.

Sincerely,

*Jack McFadden*

John R. McFadden  
Health Physicist  
(215) 823-3745

/aab  
Enc.

CC: T. P. Handley  
C. B. Chilton

Account No.	6606468
Check No.	8150/3E
Date of Issue	Renewal
Check Rec'd	8/19/82
Received By	Brown

RECEIVED BY EMB	
Date	8/19/82
By	Aug PG 4 (den 3)
By	Brown
Date	8/20/82
By	

COPIES SENT TO OFF. OF  
INSPECTION AND ENFORCEMENT

E20  
12272

<b>FORM NRC-313 I</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b> (3-80) 10 CFR 30  <b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE</b> <b>INDUSTRIAL</b>		<b>1. APPLICATION FOR:</b> <i>(Check and/or complete as appropriate)</i>		
<i>See attached instructions for details.</i>  Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.		<input type="checkbox"/> a. NEW LICENSE		
		<input type="checkbox"/> b. AMENDMENT TO: LICENSE NUMBER		
		<input checked="" type="checkbox"/> c. RENEWAL OF: LICENSE NUMBER <b>X 37-02006-09</b>		
<b>2. APPLICANT'S NAME</b> <i>(Institution, firm, person, etc.)</i>  <u>General Electric Co.-Space Systems Division</u> TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (215) 962-2000		<b>3. NAME AND TITLE OF PERSON TO BE CONTACTED</b> <b>REGARDING THIS APPLICATION</b>  <u>John R. McFadden-Health Physicist</u> TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (215): 962-4570 or 823-3745		
<b>4. APPLICANT'S MAILING ADDRESS</b> <i>(Include Zip Code)</i> <i>(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)</i> Valley Forge Space Center-Rm. L9506 P.O. Box 8555 Phila., PA 19101		<b>5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED</b> <i>(Include Zip Code)</i> CC&F Bldg. 8-Rm. 8128A 780 Third Avenue King of Prussia, PA 19406		
(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)				
<b>6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL</b> <i>(See Items 16 and 17 for required training and experience of each individual named below)</i>				
FULL NAME		TITLE		
a.	See Attachment 6.			
b.				
c.				
<b>7. RADIATION PROTECTION OFFICER</b>  John R. McFadden		<i>Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.</i>		
<b>8. LICENSED MATERIAL</b>				
L I N E  NO.	ELEMENT AND MASS NUMBER  A	CHEMICAL AND/OR PHYSICAL FORM  B	NAME OF MANUFACTURER AND MODEL NUMBER <i>(If Sealed Source)</i>  C	MAXIMUM NUMBER OF MILLCURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME  D
(1)	Cobalt-60	AECL Type C-166 or C-167 sealed source	(b)(4)	
(2)		mounted in a Gammacell 220 Irradiator		maximum at any one
(3)		manufactured by Atomic Energy of Canada,		time
(4)		Ltd.		
<b>DESCRIBE USE OF LICENSED MATERIAL</b> <b>E</b>				
(1)	For research and development studies on the radiation response of various materials.			
(2)				
(3)				
(4)				

STORAGE OF SEALED SOURCES						
LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.			
(1)	AECL Gammacell 220 Irradiator - storage and use	AECL	220			
(2)						
(3)						
(4)						
10. RADIATION DETECTION INSTRUMENTS						
LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)						
(2)		See Attachment 10.				
(3)						
(4)						
11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10						
<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY				<input checked="" type="checkbox"/> b. CALIBRATED BY APPLICANT <i>Attach a separate sheet describing method, frequency and standards used for calibrating instruments.</i>  See Attachment 11.		
12. PERSONNEL MONITORING DEVICES						
TYPE <i>(Check and/or complete as appropriate.)</i> A			SUPPLIER <i>(Service Company)</i> B		EXCHANGE FREQUENCY C	
<input type="checkbox"/> (1) FILM BADGE  <input checked="" type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)  <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____			Teledyne Isotopes Co., 50 Van Buren Ave., Westwood, N.J. 07675		<input type="checkbox"/> MONTHLY <input checked="" type="checkbox"/> QUARTERLY  <input type="checkbox"/> OTHER (Specify): _____ _____	
13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)						
<input checked="" type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. <input type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. See Attachment 13. <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.						
14. WASTE DISPOSAL						
a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED Teledyne Isotopes Co., 50 Van Buren Avenue, Westwood, N.J. 07675						
b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE. The sealed sources will be returned to the manufacturer of the irradiator.						

**INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17**

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
  
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
  
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

**18. CERTIFICATE**

*(This item must be completed by applicant)*

*The applicant and any official executing this certificate on behalf of the applicant named in Item 2, 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.*

**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.**

<p>a. LICENSE FEE REQUIRED <i>(See Section 170.31, 10 CFR 170)</i></p> <p align="center">\$ 150.00</p>	<p>b. CERTIFYING OFFICIAL <i>(Signature)</i></p> <p align="center"><i>John R. McFadden</i></p>
<p>(1) LICENSE FEE CATEGORY:            3 E</p>	<p>c. NAME <i>(Type or print)</i> 1982</p> <p align="center">John R. McFadden</p>
<p>(2) LICENSE FEE ENCLOSED: \$ 150.00</p>	<p>d. TITLE</p> <p align="center">U.S. NUCLEAR REGULATORY COMMISSION Health Physicist</p> <p>e. DATE</p> <p align="center">August , 1982</p>

ATTACHMENT 6

6. Prior to the start of any work with radioactive materials, all operations involving radioactive materials must be approved by the Ionizing Radiation Advisory Group (IRAG) according to mandatory safety procedure M-6.

A copy of M-6 is enclosed. This document includes: policy statement and responsibilities and procedures (for all personnel working with ionizing radiation, for supervisors of personnel working with ionizing radiation, for managers of components utilizing ionizing radiation, for the IRAG, for the Manager - Industrial Security, Safety and Administrative Services, for the Manager - Industrial Safety and Hygiene, for the Health Physicist, and for the Medical Director). Also included in M-6 are the responsibilities and procedures for procuring, receiving and transporting of radioactive materials.

Members of the IRAG include:

Chairman:	T. P. Handley	-	Mgr. of Industrial Security, Safety and Administrative Services
Member:	C. B. Chilton	-	Mgr. of Industrial Safety and Hygiene
Member:	S. J. Mucha, M.D.	-	Medical Director
Secretary:	J. R. McFadden	-	Health Physicist

ATTACHMENT 10

10. RADIATION DETECTION INSTRUMENTS

<u>Type of Instruments Make &amp; Model Name</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>
Victoreen Model 740F	1	Alpha Beta Gamma	0-25, 250, 2500, 25000 mR/hr	0.6 mg/cm <sup>2</sup> & 500 mg/cm <sup>2</sup>	Surveying
Nuclear Measurements Corp. Pc-3T	1	Alpha Beta Gamma	0 to 99,999 K counts	Windowless Gas Flow Counter	Measuring
Victoreen Model 470A	1	Alpha Beta Gamma	0-3, 10, 30, 100, 300, 1000 mR/hr & R/hr	17 mg/cm <sup>2</sup> & 500 mg/cm <sup>2</sup>	Surveying
Nuclear Measurements Corp. PC-4	1	Alpha Beta Gamma	0 to 3500 K counts per minute	Windowless Gas Flow Counter	Measuring

ATTACHMENT 11

11. Calibration of Instruments Listed in Item 10.

Radiation monitoring equipment (gamma dose rate meters) is calibrated every three months at four different distances from one of the following sources: Cobalt-60, 15 millicuries on 2/19/70, in Radiation Products Division's Model 571 meter calibration kit, SN 108, and/or CS-137, 42.5 mR/hr ( $\pm 5\%$ ) at 30 inches on 12/8/77, in EON Corp./Nuclear Associates' Gamma Calibrator Model 64-764, Sn 224.

Radiation counting equipment is calibrated on each day that counting operations are performed. The following calibrated sources are available:

Am-241	6.1	microcuries on	07/06/77
Ba-133	1.19	" "	10/07/77
C-14	0.046	" "	06/18/76
Cd-109	11.0	" "	05/12/77
Co-57	1.17	" "	08/09/77
Co-60	0.01	" "	09/18/69
Co-60	1.25	" "	08/11/77
Cs-137	1.08	" "	08/18/77
I-129	0.099	" "	01/ /77
Na-22	8.36	" "	04/01/69
Ni-63	0.0345	" "	12/06/76
Pu-239	0.005	" "	12/10/74
Sr-90	0.01	" "	02/26/69

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 13

13. FACILITIES AND EQUIPMENT

The irradiator facility is located within the CCF8 building of the Valley Forge Space Center. This building is located on 3rd Avenue in King of Prussia, Pa.

Figure 1 shows a plan view of CCF8 with the radiation laboratory indicated by the shaded section. The south and west sides of the building are separated from the warehouse and maintenance sections. A guard at door No. 1 controls access to the south and west portions of the building, for purposes unrelated to the use of radioactive material. Doors into this area are alarmed. All doors are alarmed when the building is unmanned.

Figure 2 shows a plan view of the Radiation Laboratory. The irradiator is located in Room 8128A. Normal access is controlled to the general laboratory area by Cypherlock "A" at point  $\triangle$  to the plan. Access to the irradiator is controlled by Cypherlock "B" at point  $\triangle$  on the plan. The double door from Room 8410 into the corridor may be used infrequently to move large equipment.

An access list will be maintained of personnel authorized to possess the combination to Cypherlock "B". Personnel on this list shall have the prior approval of the Ionizing Radiation Advisory Group (IRAG). Certain personnel, as approved by the IRAG, shall have authority to admit visitors to the irradiator room. A visitors log shall be maintained.

When an individual is removed from the list, the Cypherlock combination shall be changed.

The irradiator console keys shall be kept under combination lock when not in use. Knowledge of the combination shall be limited to currently approved operators.



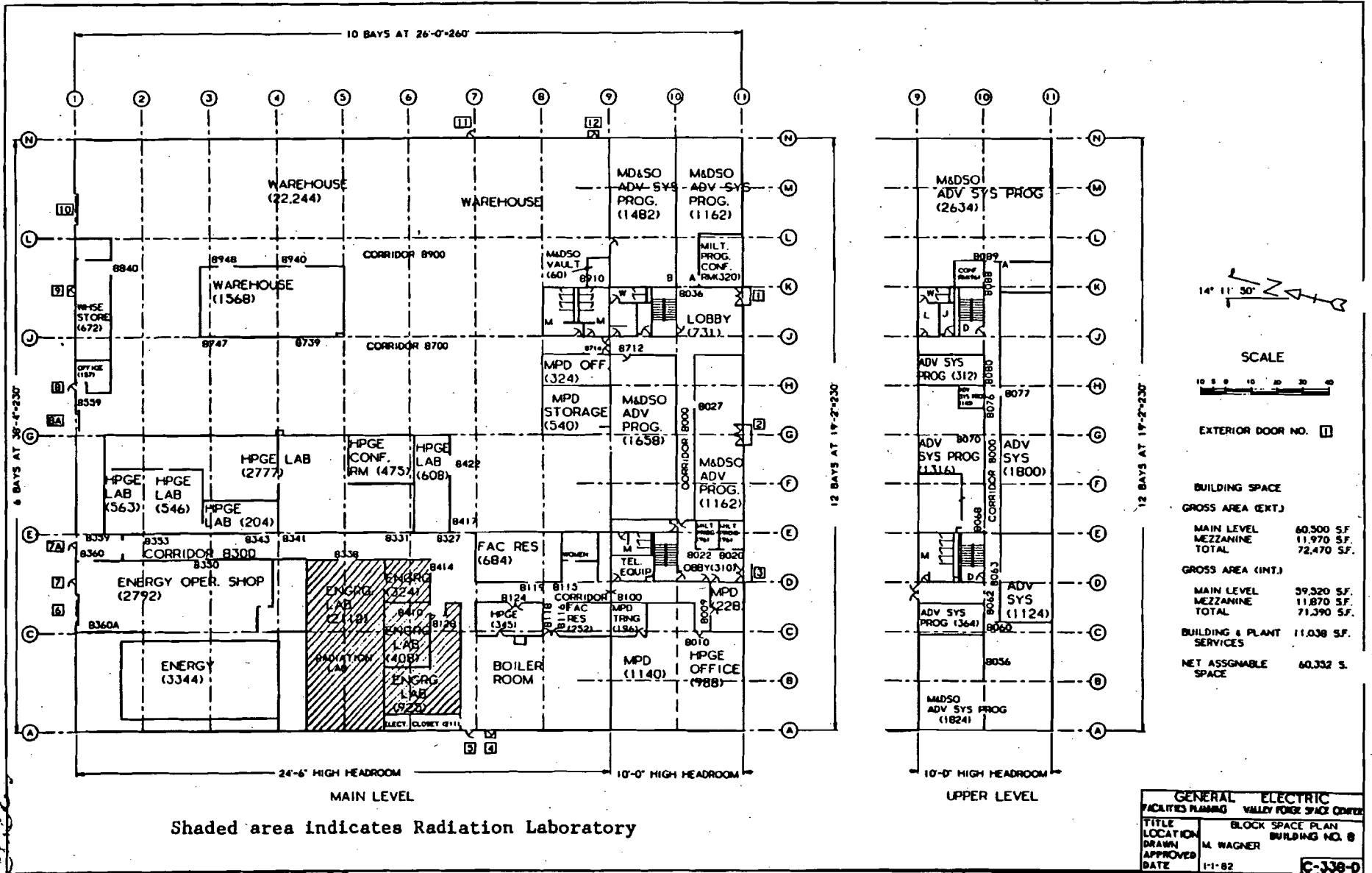


FIGURE 1. CC&F 8 BUILDING LAYOUT

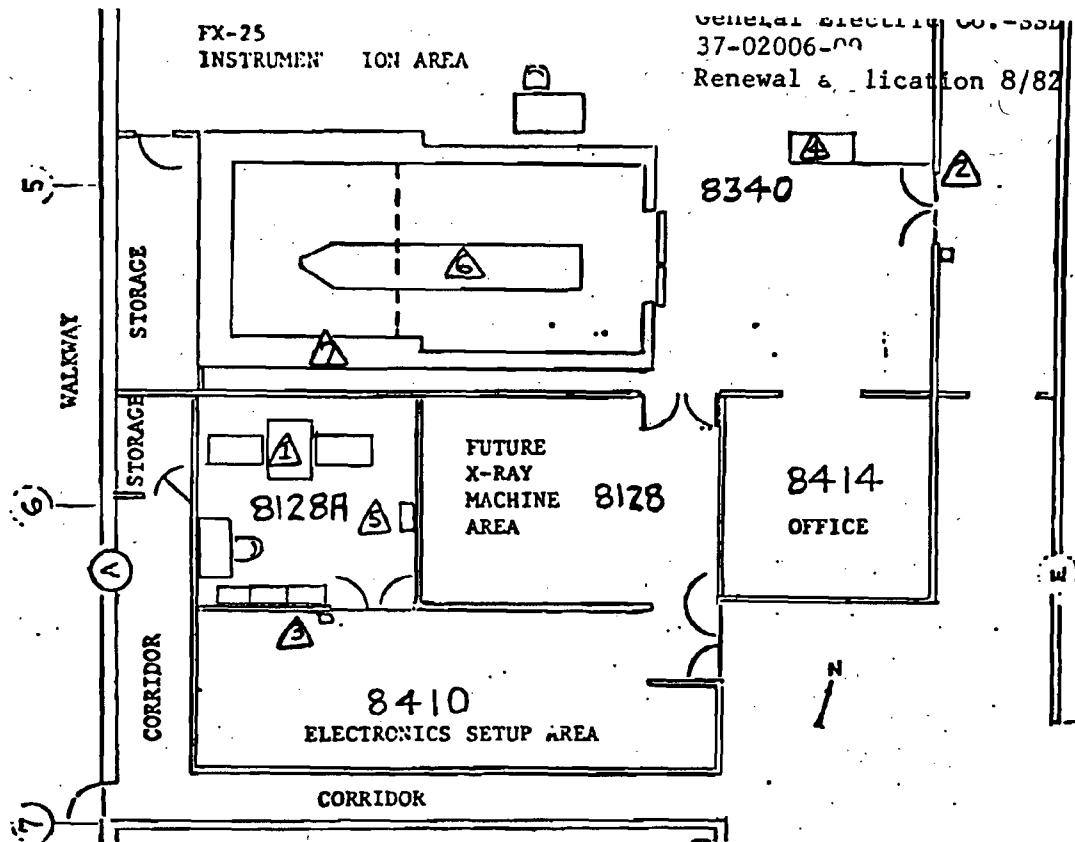


FIGURE 2 RADIATION LABORATORY FLOORPLAN  
(See Keyed Notes Below)

NOTES TO FIGURE 2

GENERAL

1. Doors shown in usual positions.
2. Furniture and setups outside Room 8128 not shown.
3. 8340, etc. are room numbers.
4. Drawn to scale.
5. Usual access to the Gammacell 220 Unit is from Room 8340, through Rooms 8128 and 8410 to Room 8128A.

SPECIFIC

- 1. Gammacell 220 unit.
- 2. Door entry by cipher lock "A" during normal shift if laboratory is attended. Door entry by cipher lock "A" and key outside time of laboratory work shift(s).
- 3. Door entry by cipher lock "B".
- 4. Personnel dosimetry station.
- 5. Survey meter.
- 6. Ion Physics FX-25 Flash X-Ray Machine.
- 7. FX-25 Concrete Vault.

ATTACHMENT 15

Radiation Protection Program for Gammacell 220

1. RPP Administration

Administrative control has been achieved thru the use of procedure M-6, "Ionizing Radiation Control", and the Ionizing Radiation Advisory Groups' (IRAG) review and approval of the radiation safety policy for the Gammacell 220 facility. A copy of M-6 is attached, and this mandatory safety procedure document describes the responsibilities of the IRAG, the health physicist, and the supervisors and users of ionizing radiation. Attached is an organization chart showing the reporting sequence for the personnel involved.

2. Duties of Health Physicist

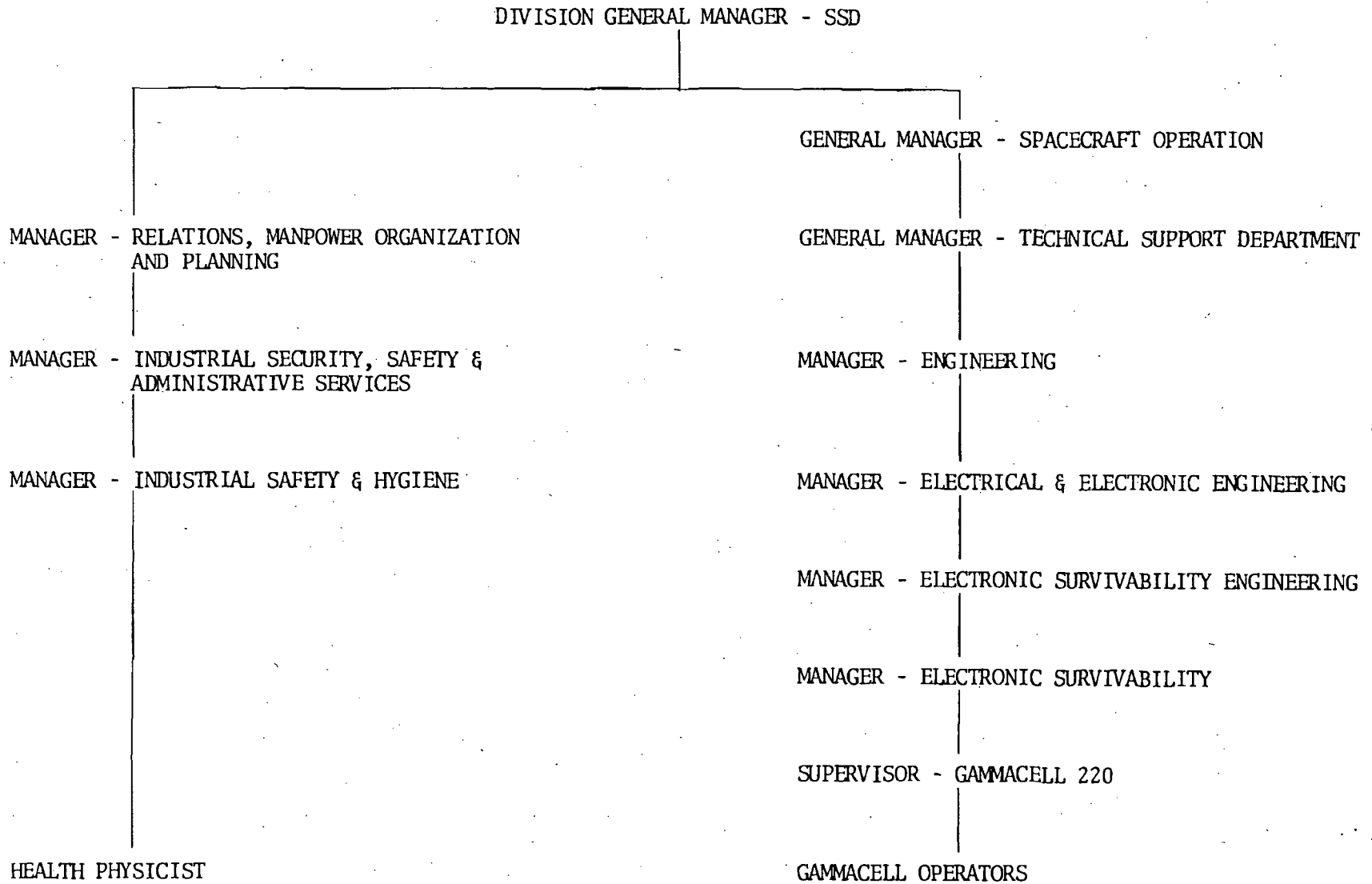
The health physicist is responsible for:

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 appropriate regulations.
6. Developing and maintaining emergency procedures.
7. Investigating and preparing reports of all actual or suspected excessive or unauthorized exposure to ionizing radiation.

3. Duties of Operators

Each operator is responsible for:

1. Wearing the prescribed monitoring equipment (i.e., TLD 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.



ATTACHMENT 15

Radiation Protection Program for Gammacell 220

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 deviating from the approved program without the prior approval of the IRAG.

4. Control Measures

A. Access Control 13.

See Attachment 13.

B. Operator Training Program.

Operators and their supervisors are expected to have knowledge of radiation commensurate with the potential radiological health problems involved in the use of the irradiator.

Personnel with prior similar experience are normally considered qualified by the IRAG. Personnel without the required experience receive verbal instruction covering the subjects listed in 10 CFR 19.12. This orientation usually lasts at least one half of an hour, and the subject areas are given roughly equal weight.

The competency of an authorized operator is usually verified by observed use under the supervision of an authorized and certified operator. The supervising operator then certifies to the IRAG that the new operator has demonstrated the capability to perform the required work safely. Observation by the health physicist during use and oral and/or written tests are seldom used.

The instructor normally is the health physicist. However, with IRAG approval, other professionals in the safety operation may occasionally provide this orientation.

C. Operating Procedure.

The basic operating procedure for the Gammacell 220 is that supplied by AECL. This basic operating procedure forms a part of the overall operating procedure to be used for the irradiator. A copy is attached.

ATTACHMENT 15

Radiation Protection Program for Gammacell 220

D. Routine Safety Precautions.

Provisions for limiting physical access to the irradiator and for key control have already been mentioned in Attachment 13.

A personnel dosimetry station provisioned with radiation badges is located in Room 8340. A radiation survey meter is located in the irradiator room.

Use of the Gammacell unit is restricted to Authorized Operators. The doors to Room 8340 and 8128 A are marked Radiation Areas.

A copy of AECL's instruction manual for the Gammacell 220 is kept in Room 8128 A.

Electronic parts and assemblies, semiconductor and dielectric materials are authorized to be exposed in the facility. Other items may be exposed upon approval of a written request to the IRAG. Explosive materials are explicitly prohibited for exposure. Care is to be taken with all samples to avoid excessive corrosion of the sample drawer.

Operators are required to maintain an exposure log for each day of use, and recordable items in the log include: date of test, description of sample, start and stop times, name of authorized operator, and reading of survey meter.

Only AECL is authorized to perform maintenance, repair, or modification of the irradiator which would involve removal of shielding or interlocks or access to the sealed sources.

E. Leak Test Procedures.

Radioactive leak tests are performed every six months. The alcohol-moistened paper discs are usually used. The leak test sample is taken from appropriate accessible surfaces of the irradiator. After drying, the sample smear is counted by using a windowless proportional counter or a thin end-window GM counter.

F. Waste Disposal.

In the event of a leaking source/s, AECL will provide for repair/disposal. Contaminated smears, etc. will be disposed of via Teledyne Isotopes, 50 Van Buren Avenue, Westwood, New Jersey 07675.

ATTACHMENT 15

Radiation Protection Program for Gammacell 220

G. Emergency Procedures.

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

FIRE

For fires in Room 8128A electric power should be turned off, Patrol notified, fire extinguishers used if practical. If the fire is not readily containable, personnel should exit the room, taking the radiation survey meter and await firemen. Fires in adjacent areas, or fires discovered in Room 8128A in the absence of Authorized Operators, one Authorized Operator and the Health Physicist are to be notified. Firemen are to be appraised of the location of the Gammacell.

POWER FAILURE

In the event of a power failure the timer will stop and it will be necessary to raise the sample drawer manually in accordance with the AECL procedures.

Test operations are not to be initiated during a power failure. Cipher lock operation is not affected by commercial power failures because it is powered by an on-site generator.

RADIATION EMERGENCY

If readings on the radiator survey meter exceed 25 mR/hr, a radiation emergency exists and the room is to be evacuated and the Health Physicist notified.

ATTACHMENT 15

AECL Standard Operating Procedures

**PART 2**

**OPERATION**

The Gammacell 220 has been designed to enable operation with minimum exposure to radiation. To ensure protection, operators should adhere to the following procedures.

**AUTOMATIC OPERATION**

1. Raise the drawer by first inserting the key in the key switch and turning it 90° clockwise, then press the UP rocker switch.
2. Open the collar doors by grasping the handles and pulling on the lever behind the right handle.
3. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.
4. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

NOTE: Materials expected to change state during irradiation should be placed in suitable containers.

Liquids expected to expand or boil should be provided with secondary containers for overflow, or vented to one of the access tubes.

The sample chamber and source cage will not withstand repeated spills of corrosive materials.

5. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced check that the door is correctly positioned in the port.
6. Close the collar doors, the left one first; ensure that the latch locks the door in place.
7. Set the required irradiation time on the digital timer in the following manner. (Refer to Figure 8.)
  - a) Push the timer reset knob, turn it clockwise 90°, and release; the white line on the knob should be horizontal.
  - b) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.
  - c) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.
8. Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.
9. To remove the sample repeat steps 2 and 3.



ATTACHEME 15

## AECL Standard Operating Procedures

**MANUAL OPERATION**

1. For initial set-up read the preceding steps 2 to 6.
2. Rotate the selector switch to MANUAL.
3. Press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

**POWER FAILURE**

In the event of a power failure the timer will stop and it will be necessary to raise the drawer manually.

1. Turn the key switch to the OFF position.
2. Spring out the large round button near the lower right corner of the back cover.

3. Push the crank (Figure 2, item 14) through the hole until it snaps into the extension on the input shaft of the reducer.
4. Crank in a clockwise direction to raise the drawer.

**NOTE:**

1. If it is necessary to change an operation time do not alter the digit settings while the drawer is down and the timer is operating. Raise the drawer and set the timer as described in AUTOMATIC OPERATION, step 7.
2. On completion of a timed operation the timer can be reset to the same operation time by depressing the reset knob.
3. If it is required that the drawer be raised during an operation the timer will store the remaining portion of the preset time until the operation is resumed.

ATTACHMENTS 16 & 17

RESUME - THOMAS P. HANDLEY - MGR. INDUSTRIAL SECURITY, SAFETY & ADMINISTRATIVE SERV.

- A. Education (b)(6)  
Wentworth Institute  
Boston, Massachuset

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.

- B. Work Experience
- |           |  |
|-----------|--|
| 1961-1963 | Radiation Protection Officer, License #37-2006-05  |
| 1963-1965 | Instructed Radiological Monitoring for PA Fallout Shelter Management Course at Penn State University                         |
| 1968-1982 | Chairman, Ionizing Radiation Advisory Group, License #37-2006-05 per Valley Forge Space Center Safety Manual Procedure M-6.0 |

Ex 6

ATTACHMENTS 16 & 17

RESUME:

Charles B. Chilton  
Manager, Industrial Safety & Hygiene  
General Electric Company  
Space Systems Division  
P.O. Box 8855  
Philadelphia, Pa 19101

Education:

BS - Virginia Polytechnic Institute, Blacksburg, Va. - Agricultural Eng.  
MS - Temple University, Philadelphia, Pa. - Industrial Hygiene

Certified Safety Professional - #1410  
Registered Professional Engineer in Safety Engineering, State of  
California - #676

Work Experience:

U.S. Army - 6 months active duty, 23 years active reserve, rank of  
Lt. Col. Taught/attended numerous chemical, biological,  
radiological (CBR) courses.

Factory Insurance Association - Fire Protection Engineer - 5 years

Celanese Corporation - Safety Supervisor - 5 years

Borg-Warner Corporation - Safety Manager - 1 year

General Electric Company - Safety Manager - 12 years

Member:

ASSE  
NFPA  
AIHA

Supervised HP activities 12 years.

Attended numerous HP short courses (U.S. Army, AIHA).

Completed 2 graduate level HP courses (Temple University).

ATTACHMENTS 16 & 17

RESUME - JOHN R. McFADDEN - GE/SSD HEALTH PHYSICIST

A. Education

Ph.D. Purdue University, W. Laf., Ind., 1967-1971, Bionucleonics.  
 M.S. Temple University, Phila., Pa., (b)(6) Radiological Health.  
 B.A. St. Joseph's College, Phila., Pa Biology

EX 6

B. Work Experience

7/72 to 10/72: Public Health trainee in radiological health unit of Philadelphia Health Department. Primary responsibilities included inspection of diagnostic x-ray machines and operations by industrial radiographers.

11/72 to 12/73: Health physicist with Nuclear Radiation Consultants, New Haven, Conn. Consultation in health/medical physics provided to hospitals in Conn. and Mass.

1/74 to 6/82: Health physicist for General Electric Company - RESD.

6/82 to present: Health physicist for General Electric Company - SSD.

C. Experience with Radiation

Isotope	Maximum Amount	Employer	Duration	Type of Use
Co-60	5000 Ci	N. R. Consultants	1 year	Radiation Therapy
P-32	0.02 "	"	1 "	"
Ra-226	0.1 "	"	1 "	"
Au-198	0.002 "	"	1 "	Nuclear Medicine
Se-75	" "	"	1 "	"
Hg-197	" "	"	1 "	"
I-131	0.001 "	"	1 "	"
Tc-99m	0.05 "	"	1 "	"
I-125	0.02 "	"	1 "	In Vitro Research
Depleted U	50 lbs.	"	1 "	Shielding
C-14	0.001 Ci	Purdue University	2 "	In Vivo Research
Any accelerator produced radio-nuclide with atomic no. 3-83 inclusive	10 "	GE/RESD	4 "	Instrument calibration and research
Ra-226	0.1 Ci	GE/RESD	4 "	Vacuum determination and fire detection
Any by-product material between at. nos. 3 and 83 inclusive	60 Ci	"	4 "	Research and Development (10 CFR 30)
H-3	100 Ci	"	4 "	"
Any by-product material	1 "	"	4 "	Activated electronic components
Ni-63	0.024 "	"	2 "	GC detector cells
Natural or depleted U	1500 lbs.	"	2 "	Solid metal alloys and powders-R & D
Natural Th	40 "	"	2 "	Powders and metal alloys-R & D

ATTACHMENTS 16 & 17

RESUME - STEPHEN J. MUCHA, M.D., F.A.C.S., MEDICAL DIRECTOR

A. Education

- 1952 - B.S. Degree in Biology from Franklin & Marshall College  
Lancaster, Pa.
- 1956 - M.D. Degree from the University of Pennsylvania, School of  
Medicine, Philadelphia, Pa.

B. Post Graduate Training

- 1956-1957 Internship rotating at U.S. Naval Hospital,  
Philadelphia, Pa.
- 1957-1961 General Surgical Residency, U.S. Naval Hospital,  
Philadelphia, Pa.
- 1961-1964 Assistant Chief of Surgery, U.S. Naval Hospital,  
Camp Lejeune, N.C.
- 1964-1967 Chief of Surgery, U.S. Naval Hospital, Roosevelt Roads,  
Puerto Rico.
- 1967-1971 Assistant Chief of Surgery, U.S. Naval Hospital,  
Philadelphia, Pa.
- 1971-1978 Chairman, Department of Surgery, Naval Regional  
Medical Center, Philadelphia, Pa.
- 1978- Medical Director, General Electric Company RSO,  
Philadelphia, Pa.  
Private Practice.

C. Memberships

- 1971-1978 Chairman, Disaster Committee, Naval Regional Medical  
Center, Philadelphia, Pa.
- 1971-1978 Member, Radiation Committee, Naval Regional Medical  
Center, Philadelphia, Pa.
- 1978-1982 Member, Ionizing Radiation Advisory Committee,  
General Electric Company RSO, Philadelphia, Pa.

## 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 Nuclear Regulatory 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 Doses /

1. Every reasonable effort shall be made to maintain all radiation exposures as low as reasonably achievable and within applicable limits. (ALARA)
2. Personnel who are occupationally exposed to radioactive materials licensed by the U. S. Nuclear Regulatory Commission or who are working under DOE contracts shall adhere to the provisions found in U. S. Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation." Copies of the regulations, licenses, and operating procedures are available for examination in the Industrial Safety and Hygiene Office.
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." Copies of the regulations, licenses and operating procedures are available for examination in the Industrial Safety and Hygiene Office.
4. Permissible Limits for External Exposure

<u>Part of Body</u>	<u>Rems per Calendar Quarter</u>	<u>Accumulated Dose in Rems</u>
Whole body, head and trunk, active blood-forming organs, lens of eyes, gonads	1.25 <sup>(a)</sup>	5(N-18) <sup>(b)</sup>
Hands and forearms, feet and ankles	18.75	
Skin of whole body	7.5	

(a) If exposure history is documented and approved by Health Physics and the Medical Operation, 3.0 rems per quarter is permissible, but accumulated dose must not exceed 5 (N-18) rems.

(b) 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.
6. Individuals have the right to request a report of their occupational radiation exposure data. Contact the Industrial Safety and Hygiene Office for further information.

6.2.7 Contamination

The unintentional spread of radioactive material to places where it may harm personnel or interfere with experiments.

### 6.3 POLICY

6.3.1 It is the policy of all components in the Valley Forge Area to keep the ionizing radiation exposure of all personnel as low as 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 and Administrative Services

Member: Medical Director

Member: Manager, Industrial Safety and Hygiene

Secretary: Health Physicist

6.3.3 All ionizing radiation producing 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 All ionizing radiation machines and radioactive materials shall be used only in the manner approved by the IRAG; 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 radioactive material or severe 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., TLD badge, etc.) whenever working with radiation.



2. Using the recommended contamination control equipment and following contamination control procedures as required.
3. Keeping his <sup>OR HER</sup> 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, a violation of procedures or regulations, or unnecessary exposure.
6. Adhering to the approved program unless prior approval of the IRAG has been obtained for any deviations therefrom.

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. Assuring that each individual is aware of the location of the NRC or state Notice to Employees posted in the area.
3. Coordinating with the Health Physicist to obtain all necessary radiation safety advice and assistance.
4. Disposal of radioactive material in accordance with NRC, EPA and State of Pennsylvania regulations as set forth by the Health Physicist.

6.4.3 The manager of a component requiring radioactive material 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 radio<sup>nuclides</sup> to be used or description of 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 or her 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. Post the safety requirements provided by IRAG.
6. Obtain 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 radio<sup>#</sup>nuclides or ionizing radiation-producing equipment which in the Group's opinion does or does not adequately meet safety requirements set forth by the NRC, 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.

#### 6.4.6 The Manager, Industrial Safety and Hygiene is responsible for:

1. Serving as a Member of the IRAG.
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 Nuclear Regulatory Commission, the Department of Transportation, 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: NRC licenses will only be secured by the Chairman, IRAG as needed. In order to avoid unnecessary delays, advise him or her of needs well in advance of critical dates).

6.4.7 | 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 Nuclear Regulatory Commission.
6. Developing and maintaining emergency procedures.
7. Investigating and preparing reports of all actual or suspected excessive or unauthorized exposure to ionizing radiation.

6.4.8 | The Medical Director is responsible for: |

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

6.4.9 | 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. | The initiating manager shall secure the written approval of the IRAG prior to the purchase or other means of obtaining any ionizing radiation producing 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.)

6.4.11 | 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.

**6.4.12 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 NRC, DOT and state regulations.

**6.4.13 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.**

**6.4.14 Facilities Engineering/Drafting 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.**

**6.4.15 Property management, or the manager responsible for the use of an ionizing-radiation-producing machine, shall notify the Industrial Safety and Hygiene Office in advance of any plans to transfer/sell/terminate any machine which produces ionizing radiation (ex., cabinet x-ray machines, x-ray diffraction apparatus, etc.) so that federal and state regulations concerning the transfer/sale/termination of each device can be addressed.**

**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 SSD-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 SSD-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 nonpurchase 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, x4570 or x1085, 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 the Nuclear Regulatory Commission Inspection and Enforcement Regional Office I, shall be notified immediately. The Health Physicist shall immediately take action to determine the extent of contamination in SSD-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 or her 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. NRC or DOT approved shipping containers shall be used where applicable.

## 6.6 EMERGENCY PROCEDURES

Procedures for radiological emergencies are established as appropriate to each application. These procedures supplement the general emergency plan in effect for the Space Center. See A-3.0, A-4.0, and F-1.0 in the Safety Manual for procedures for reporting general emergencies, accident emergencies, and fire emergencies, respectively.

The basic instruction for all employees to report any emergency is to telephone the Plant Protection Center by dialing the emergency number (FIRE, 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. This would include such situations as fires, spills, monitor alarms, and mission sources.

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

On the following page, there are examples of emergency procedures for operations involving radioactive material.

## SAMPLE EMERGENCY PROCEDURES

### Minor Spills - Unsealed Radioactive Material

1. NOTIFY: Notify persons in the area that a spill has occurred.
2. PREVENT SPREAD: Cover the spill (with absorbent paper if spill is liquid).
3. CLEANUP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper containing the spill. Insert into a plastic bag and dispose of in the radioactive waste container. Also insert into the plastic bag all other contaminated materials such as disposable gloves. Non-liquid spills are to be cleaned up in a manner which will minimize the possibility of any of the spill becoming airborne and inhaled.
4. SURVEY: With a low-range, thin-window G-M survey meter, check the area around the spill, hands, and clothing for contamination.
5. REPORT: Report incident to the Industrial Safety and Hygiene Office.

### Major Spills - Unsealed Radioactive Material

1. CLEAR AREA: Notify all persons not involved in the spill to hold their breaths and to vacate the room.
2. PREVENT SPREAD OF SPILL: While holding their breaths, personnel involved in the spill should: cover the spill (with absorbent paper if spill is liquid), close all windows, shut off fans and air conditioners, and leave the room. No immediate attempt should be made to clean up the spill.
3. SHIELD SOURCE: If possible, the spill should be shielded (if penetrating radiation is involved), but only if it can be done without further contamination or without significantly increasing your radiation exposure.
4. CLOSE ROOM: Leave the room and lock the door(s) to prevent entry.
5. CALL FOR HELP: Notify the Industrial Safety and Industrial Office.
6. PREVENT SPREAD OF CONTAMINATION: All involved personnel should remain in one confined area to limit spread of contamination  
(every person who might have been in the immediate area of the spill should be considered contaminated until checked by the Health Physicist); if the spilled material was powdered, the door(s) and other openings leading into the room should be sealed with wide masking tape or adhesive tape and heavy wrapping paper in order to limit spill to the room.

7. PROHIBIT ENTRY: Entry into the contaminated area should be prohibited and the Health Physicist will direct all subsequent operations, such as: surveying the area and evaluating the extent of the emergency, surveying all personnel involved, supervising decontamination of all personnel, if necessary, and supervising decontamination of the room.
8. PERSONNEL DECONTAMINATION: Contaminated clothing should be removed and stored for further evaluation; if the spill is on the skin, flush thoroughly and then wash with mild soap and lukewarm water.

Missing Source - Sealed Radioactive Material

1. CLEAR AREA: Notify all persons not involved in the search to vacate the area.
2. CALL FOR HELP: Notify the Industrial Safety and Hygiene Office.
3. SURVEY: Survey and cordon off the radiation hazard area.
4. PROHIBIT ENTRY: Prohibit entry into the radiation hazard area and await assistance from the Industrial Safety and Hygiene Office.



# GENERAL ELECTRIC

*Systems*

SPACE SYSTEMS DIVISION

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

## Certification of Authorization to Receive Radioactive Materials

This certifies that the Space Systems 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 \_\_\_\_\_.

<u>Material</u>	<u>Form</u>	<u>Quantity</u>
-----------------	-------------	-----------------

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

General Electric Company  
Space Systems Division  
Valley Forge Space Center  
230 East Goddard Boulevard  
King of Prussia, Pennsylvania 19406

\_\_\_\_\_  
Health Physicist and Date

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

M-6-12

**SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS**

<input type="checkbox"/> <b>AIR TRANSPORT ONLY</b>	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.
<input type="checkbox"/> <b>SURFACE TRANSPORT ONLY</b>	THIS IS TO CERTIFY THAT THE HEREON NAMED ARTICLES ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, 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

**ADDITIONAL INFORMATION REQUIRED FOR FISSILE MATERIALS ONLY**

<b>EXEMPTED FROM THE ADDITIONAL REQUIREMENT FOR FISSILE MATERIALS</b>	<b>NOT EXEMPTED</b>
	FISSILE CLASS I <input type="checkbox"/>
	FISSILE CLASS II <input type="checkbox"/>
	FISSILE CLASS III <input type="checkbox"/>
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<sup>2</sup>: BETA-GAMMA \_\_\_\_\_ DPM/100 CM<sup>2</sup>

**APPROVED FOR SHIPMENT** \_\_\_\_\_  
(SIGNATURE OF HEALTH PHYSICS)

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