

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☐ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
☒ C. RENEWAL OF LICENSE NUMBER 37-19533-01

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Union Carbide Corporation
Bushy Run Research Center
R. D. #4 Mellon Road
Export, PA 15632

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Union Carbide Corporation
Bushy Run Research Center
R. D. #4 Mellon Road
Export, PA 15632

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Marilyn J. Tallant

TELEPHONE NUMBER
(412) 733-5245

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT

8704230052 861227
REG1 LIC30

10. RADIATION SAFETY PROGRAM.

11. WASTE MAN.

37-19533-01 PDR

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY Materials AMOUNT ENCLOSED \$ 460.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE—CERTIFYING OFFICER

F.R. Frank

TYPED/PRINTED NAME

Fred R. Frank

TITLE

Director

DATE

11/6/85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

<\$250K	\$1M-3.5M
\$250K-500K	\$3.5M-7M
\$500K-750K	\$7M-10M
\$750K-1M	>\$10M

b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)

☒ YES

☐ NO

FOR NRC USE ONLY

TYPE OF FEE

REN

FEE LOG

Nov 4

FEE CATEGORY

3M

COMMENTS

04583

AMOUNT RECEIVED

\$ 460

CHECK NUMBER

06726

"OFFICIAL RECORD COPY"

ML10

NOV 08 1985

APPROVED BY

DATE

G. Jackson
11/16/85

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

ITEMS 5 - 11

ITEM 5: RADIOACTIVE MATERIAL

a. Element and mass number	b. Chemical and/or physical form	c. Maximum amount which will be possessed at any one time
1. Carbon 14	1. Any	1. 200 millicuries
2. Hydrogen 3	2. Any	2. 200 millicuries
3. Sulfur 35	3. Any	3. 100 millicuries
4. Nickel 63	4. Foils or plated Sources	4. Not to exceed 15 millicuries per foil or source
5. Krypton 85	5. Sealed Sources	5. 2 Sources not to exceed 10 millicuries per source
6. Krypton 85	6. Sealed Sources	6. 7 Sources not to exceed 20 millicuries per source

ITEM 6: PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED

- 1, 2, and 3 For use in biological studies including metabolic disposition, genetic toxicology and tracer studies in lower animals.
4. *Heater-Parkard* For use in gas chromatographs for sample analysis
5. For use in Thermo Systems, Inc. Model 3054 aerosol neutralizers
6. For use in Aerosol Discharge Devices

ITEM 7: INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

MARILYN J. TALLANT, SR. SCIENTIST, RADIATION SAFETY OFFICER

Ms. Tallant received a B.S. degree from Carnegie Institute of Technology in biological sciences. She has taken courses in Radioisotope Methodology and Safety at the University of Pittsburgh School of Public Health. She has had 26 years of "on the job" experience with radioactive materials.

GEORGE W. KLEIN, STAFF SCIENTIST

Mr. Klein has a M.S. degree in Chemistry from Oregon State University and has worked with highly radioactive tritiated water and Cl^{14} labeled compounds. He is responsible for the technological implementation of health, safety and environmental programs at BRRC.

(ITEM 7 CONTINUED)

DANIEL L. GEARY, ADMINISTRATIVE DIRECTOR

Mr. Geary has a M.S. degree in Industrial Hygiene from the University of Pittsburgh. He is responsible for implementation of laboratory programs for good laboratory practices, safety, health and environmental protection at BRRC.

ITEM 8: TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

1. Eating, drinking, smoking and the use of cosmetics in the laboratory are not permitted. Food or drinks should NEVER be stored in a refrigerator used for storing radioactive substances.
2. Whenever possible, carry out all laboratory operations over a flat tray lined with special absorbent paper [see Radiation Safety Officer (Ext. 5245) for source of supply]. If material is volatile or dusty, perform operation in an appropriate hood or glove box after checking with Radiation Safety Officer for suitable set-up and monitoring arrangements.
3. Pipetting or the performance of any similar operation should Not be done by mouth suction.
4. All work with radioactive materials in a dispersible form will be done while wearing disposable gloves. Before a worker leaves the laboratories, the hands must be washed first.
5. If, in the course of work, personal contamination is suspected, a survey with a suitable instrument should be made immediately. This should be followed by the required cleansing and a further survey. Routine precautionary surveys should be made at intervals.
6. No person should work with active materials if he has any breaks in the skin on the hands unless he wears rubber gloves. All such breaks should be reported to the supervisor in charge before work begins.
7. Radioactive liquid wastes should be poured into appropriately labeled containers.
8. Radioactive solid wastes and contaminated materials should be placed in designated containers.
9. Good housekeeping is encouraged at all times. Spillage should be prevented, but in the event of such an accident, the following procedure should be followed:

- a. The liquid should be blotted up. (Wear rubber gloves.)
 - b. All disposable materials contaminated by the spill and the cleaning process should be placed in a designated container.
 - c. The area of the spill and the type of activity (e.g., ^{14}C , ^3H) should be clearly marked.
 - d. The Radiation Safety Officer must be notified at once of any spillage or dispersal of radioactive material.
10. All injuries should be reported to the site nurse, or after hours, to the guard on duty and the Radiation Safety Officer.

ITEM 9: FACILITIES AND EQUIPMENT

Description of Rooms in Which Radioactivity will be Used

Room 108: "Wet" Chemistry

Dimensions: 18' x 18' Ventilation: 2-5' x 2' 6" fume hoods with system capacity of 1450 CFM each. Each hood is separately vented to the roof through HEPA and activated charcoal filters.

Room 109: Animal Studies

Dimensions: 18' x 18', Ventilation: 1-5' x 2'-6" fume hood and 2-5' x 2' 6" walk-in fume hoods. These hoods have individual system capacities of 1450 CFM, 1750 CFM and 3500 CFM. Each hood is separately vented to the roof through HEPA and activated charcoal filters.

Room 110: Pharmacokinetics

Dimensions: 18' x 18', Ventilation: 1-5' x 2' 6" fume hood and 1-5' x 2' 6" walk in fume hood. These hoods have individual system capacities of 1450 and 3500 CFM. Each hood is separately vented to the roof through HEPA and activated charcoal filters.

Room 120: Cell Biology

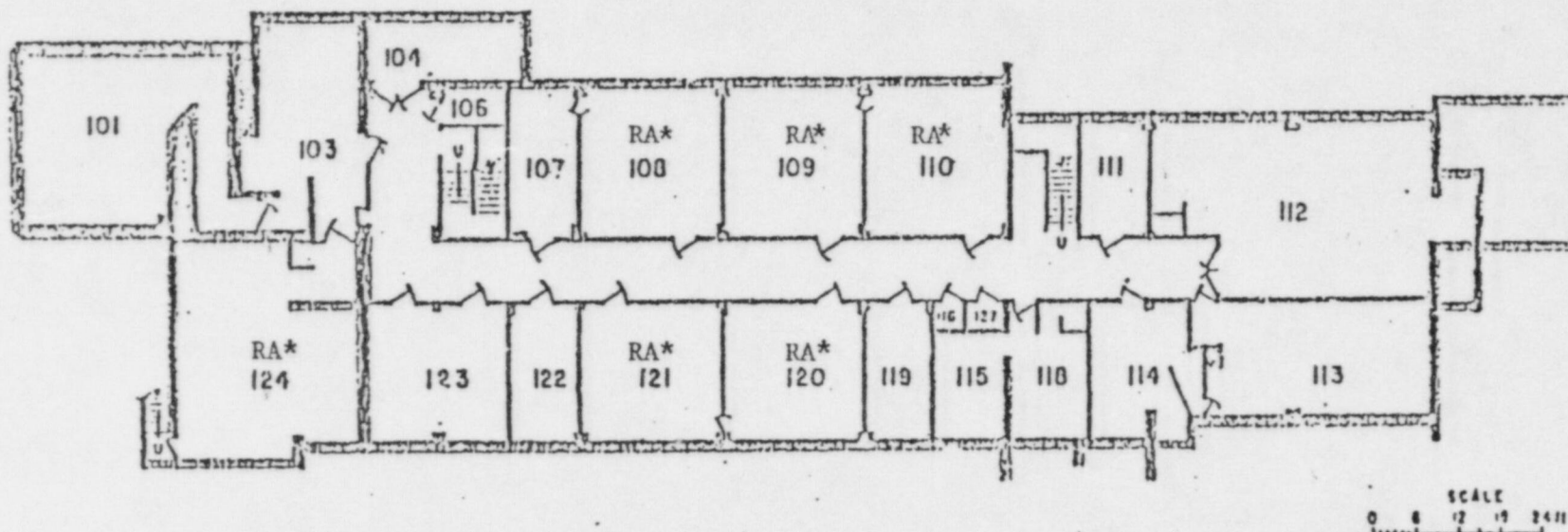
Dimensions: 18' x 18', Ventilation: this room is supplied by normal building ventilation (250-350 CFM). It contains one Biohazard hood which is internally vented after passing through a HEPA filter.

Room 121: Liquid Scintillation and storage

Dimensions: 18' x 18', Ventilation: this room is supplied by normal building ventilation (250-350 CFM). Packard 2660 and Tracor Analytic II Liquid Scintillation Counters.

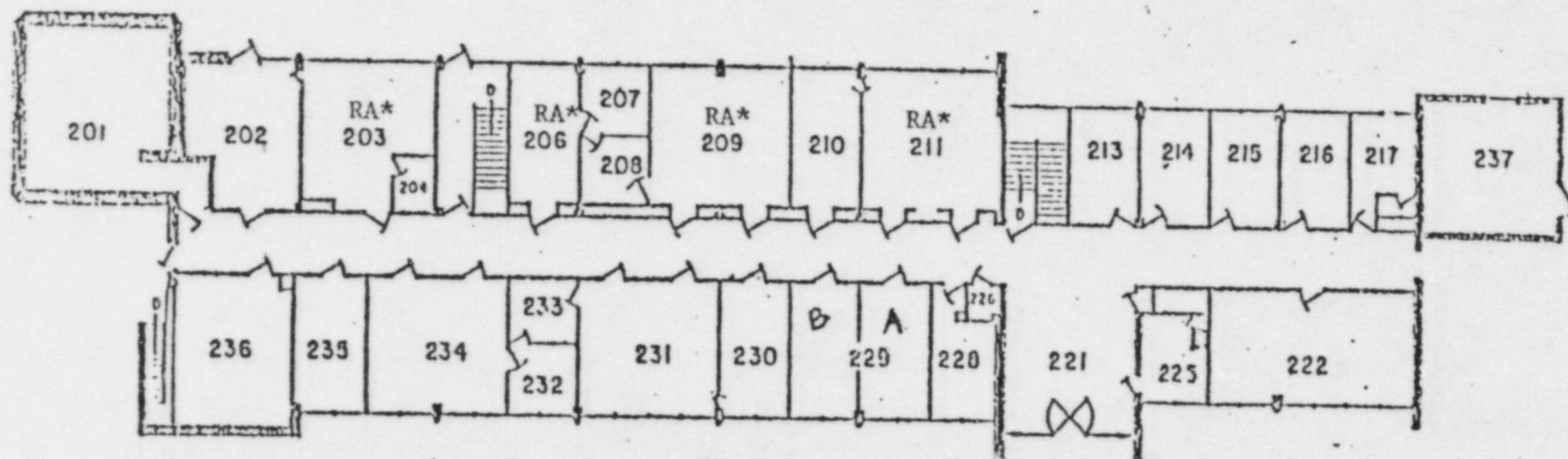
Room 124: Cell Biology

Dimensions 24' x 30', Ventilation: 1-5' x 2' and 1-6' x 2' biohazard hood with a combined system capacity of 750 CFM. These hoods are connected to the outside through a common duct and internal HEPA filters, 1-5' x 2' 6" building ventilation (250-350 CFM).



BASEMENT FLOOR
 Bushy Run Research Center
 Radiation Building, Export, Pa.

*RA - indicates rooms in which radioactive materials will be used.



FIRST FLOOR

Bushy Run Research Center
Radiation Building, Export, Pa.

*RA - indicates rooms in which radioactive materials will be used.

fume hood with a system capacity of 1200 CFM. This hood is connected to the outside through a separate duct equipped with an HEPA filter. Total air supply to this room is 2900 CFM.

Room 203: Liquid Scintillation

Dimensions: 18' x 18', Ventilation: this room is supplied by normal building ventilation (250-350 CFM).

Room 206: Storage and Analytical Weighing

Dimensions: 18' x 9', Ventilation: this room contains 1-3' 6" x 2' 4" fume hood which has the capacity to draw 638 CFM. It is vented to the roof. The room is further supplied by normal building ventilation (250-350 CFM).

Room 209: Analytical Chemistry

Dimensions 18' x 18', Ventilation: this room contains 1-3' 6" x 2' 4" fume hood which has the capacity to draw 388 CFM. It is vented to the roof. The room is further supplied by normal building ventilation (250-350 CFM).

Room 211: Biochemistry

Dimensions 18' x 18', Ventilation: this room contains 1-3' 6" x 2' 4" fume hood which has the capacity to draw a 499 CFM. It is vented to the roof. The room is further supplied by normal building ventilation (250-350 CFM).

ITEM 10: RADIATION SAFETY PROGRAM

1. Radiation Safety Committee

- a. The Radiation Safety Committee will meet at least twice a year.
- b. The members of the Radiation Safety Committee will be aware that their duties and responsibilities include an annual review of the Research Centers radiation safety program. They will keep in close contact with the procedures involved at all times through monthly reports of activities concerning radiation safety.
- c. Safety evaluations of the proposed use of radioactive materials will begin with the authorization for the purchase of radioactive isotopes. The principal investigator will be required to discuss in detail the proposed use of the isotope. Also the detailed review must include a description of the facility and equipment, operation, and all safety procedures. This form will be reviewed by the Radiation Safety Officer or the entire program will be evaluated with the principal investigator, the departmental representative, the Radiation Safety Officer, and the Chairman of the Committee.

2. DUTIES OF THE RADIATION SAFETY OFFICER

The RSO will conduct radiation safety instructions which will be mandatory for new research personnel using sources of ionizing radiation.

The RSO will supervise the performance of routine surveys as deemed necessary to insure the safe use of radioactive materials in accordance with Federal Regulations and accepted radiation safety practice.

The RSO will inspect all laboratories using ionizing radiation to insure compliance with existing Federal and State Regulations. The RSO must maintain cognizance over records of all exposures as measured by urine analyses and surveys, and of the disposition of all radioisotopes under the conditions of the Research Center license. This includes requirement of submission of records by users, showing safe use of radiation sources, including records of users' surveys and source disposition.

The RSO will supervise performance of nonroutine monitoring of operations in which there is a reasonable possibility of hazard.

The RSO will provide advice and recommendations regarding safe use of radioisotopes, decontamination, waste disposal, etc.

The RSO will assure the calibration of all health physics radiation measuring and monitoring instruments.

The RSO will participate in radiation safety educational programs and conferences and otherwise maintain professional contacts.

The RSO will submit to the Chairman of the Radiation Safety Committee a report of all activities pertaining to the radiation safety program.

The RSO will utilize a Health Physics Consultant as an independent monitor and advisor on subjects related to the overall radiation safety program. The Health Physics Consultant will be asked to audit the radiation safety program periodically.

3. USER QUALIFICATION

All new users of radioactive materials will be required to submit information concerning their training and/or experience with radioactive materials.

The user will be interviewed by the Radiation Safety Officer with an indoctrination in the safe use of radioisotopes. The departmental representative will also be made aware of the potential user. Should there be any doubt as to the user's qualifications, the matter will be brought to the attention of other members of the Committee and then to the full Committee.

If the potential user receives approval to work with radioactive material, he will be placed under the direct responsibility and supervision of the principal investigator until such time that the user shows proficiency in all aspects of safe handling and use of the radioactive material. All supervisors must meet the qualifications to use the material as stipulated in Section 33.15(b) of 10CFR Part 33.

4. OPERATING PROCEDURES

- a. Normal procedures are covered in Safety Instructions While Working With Radioactive Materials.
- b. All containers or bags of radioactive wastes will be labeled as to isotope, amount of activity, and the date of assay.

Whenever the containers are full, the Radiation Safety Officer will be notified. The wastes will be taken to a storage room under the supervision of the RSO.

All radioactive waste not disposed of by incineration or release to sanitary sewer as authorized in 10CFR 20 will be packaged and delivered to a commercial waste disposal service.

- c. Incident Procedures to include:

Minor Spills

1. NOTIFY: Notify persons in the area that a spill has occurred.
2. PREVENT THE SPREAD: Cover the spill with absorbent paper.
3. REPORT: Report incident to the Radiation Safety Officer.
4. CLEAN UP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper and pad. 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.
5. SURVEY: With a low-range, thin-end window G-M survey meter, check the area around with the spill, hands, and clothing for gross contamination. Use same to define extent of spill and to assure that it has been cleaned up.

Major Spills

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.
2. CALL FOR HELP: Notify the Radiation Safety Officer immediately.

3. PREVENT THE SPREAD: Cover the spill with absorbent paper but do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread.
4. SHIELD THE SOURCE: If possible, the spill will be shielded but only if it can be done without further contamination or without significantly increasing your radiation exposure.
5. CLOSE THE ROOM: Leave the room and lock the door(s) to prevent entry.
6. PERSONNEL DECONTAMINATION: Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush thoroughly and then wash with mild soap and lukewarm water. Survey the contaminated area with a thin-end window G-M meter to determine if gross radioactive material has been removed. Follow up with contamination smears to assure that the area is contamination free.

RADIATION SAFETY OFFICER: Marilyn J. Tallant
OFFICE PHONE: 733-5245
HOME PHONE: 523-2505

ALTERNATE: George W. Klein
OFFICE PHONE: 733-5240
HOME PHONE: 327-2875

5. SURVEY PROCEDURES

A. Survey Instruments

Survey instruments will be calibrated annually and after servicing, by RAD Services Inc., Pittsburgh, PA 15239 (412) 733-1900. Sources used will have calibrations traceable to National Bureau of Standards.

B. Survey Program

1. All sample preparation laboratories will be surveyed immediately following the preparations and decontaminated if necessary.
2. Other laboratory areas will be surveyed during and after studies using radioactive materials are completed.
 - a. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 m Rem/hour, when appropriate.
 - b. A series of wipe tests to measure contamination levels. The wipe test will be sensitive to detect 100 dpm per 100 cm² for the contaminant involved.

3. A permanent record will be kept of all survey results. The record will include:

- a. Location, date, and type of equipment used.
 - b. Name of surveyor.
 - c. Drawing of area surveyed, identifying relevant features, such as storage areas, etc.
 - d. Measured exposure rates, keyed to location on the drawing.
 - e. Rates requiring corrective action will be designated as such.
 - f. Detected contamination levels, keyed to locations on drawing.
 - g. Corrective action taken in case of contamination or excessive exposure rates with appropriate comments.
4. Areas will be cleaned if the contamination level exceeds 500 dpm per 100 cm².
5. The frequency of the surveys will also be determined by a designated level (low, medium, and high) based on radionuclide, activity and use as designated by the Report of Committee V, ICRP, 1965.

5. RECEIVING MATERIALS

All packages containing radioactive materials will enter the facility and be delivered as expeditiously as possible to the RSO's office. There they will be monitored by a qualified investigator. The potential user and/or principal investigator will be called in case the Radiation Safety Office is not immediately available.

Packages received during off-duty hours will be left in the office of the RSO where they will be inspected and monitored first thing on the next working day. This will usually be done by the Radiation Safety Officer or the principal investigator who has ordered the isotope.

All incoming packages will be examined by the RSO or a qualified representative for leakage, contamination, or damage. Should the Radiation Safety Officer not be available for a few days, the principal user will be informed to monitor and claim his package.

If there is no apparent damage and the radiation levels are consistent with the transport index, the package will be taken to a lab for unpacking. Smears will be taken immediately should the radiation levels be higher than expected. All packaging material will be also monitored for possible contamination upon removal of the sample. If leaking or contamination is suspected, the package will be placed in an appropriate container and held until the Radiation Protection Officer repackages the isotope and the vendor is notified.

6. STANDARD OPERATING PROCEDURE (6.1B) FOR RECEIVING SHIPMENTS OF RADIOACTIVE MATERIALS

1. Shipments of radioactive materials to the Bushy Run Research Center will be received at the central receiving/shipping dock area and delivered immediately to the office of the Radiation Safety Officer. There, it will be checked as soon as possible for damage or contamination.
2. If no contamination is detected and if there is no visible damage to the package, it will then be delivered to the principal investigator for storage as specified in the "Application for Radioisotope Procurement" which will accompany all purchase orders for radioactive materials. At this time, the quantity of radioactivity and the radionuclide received, the date and the chemical form in which the radionuclide is incorporated, will be recorded in the radioactive compound inventory.
3. Packages which are visibly damaged will henceforth be handled with gloves. They will be placed in the hood of Room 110 in the Radiation Building. The package will be monitored with a thin-end window G-M meter. Contamination smears will also be made of the outside of the package and the inside packing, as appropriate. The radiation Safety Officer will then be notified. Results of any radioactive contamination will be given to the Radiation Safety Officer and he/she will take further responsibility for disposition of the material.
4. If, at a later date, further unpacking reveals damage or breakage of the sample container, the Radiation Safety Officer of the Research Center will be immediately notified. A survey of the container, remaining packing material, and the surrounding area will then be made with a thin-end window G-M monitor. At this point in time, the package will not be moved from its present location. The results of the survey will be given to the Radiation Safety Officer who will then direct further disposition of the sample and other contaminated materials.

7. MAINTENANCE

- A. The Administrative Director shall ensure that all housekeeping personnel who are assigned to work in the building will know and understand the rules which have been established for their safety:
 1. Housekeeping personnel will not do any work inside a fume hood or glove box which bears a radiation sign.
 2. Housekeeping personnel will not clean the inside of a sink which is placarded with a radiation sign.
 3. All housekeeping personnel will remain outside any area within a laboratory which is roped off with a yellow and magenta or other radiation warning rope.

B. The Site Engineer shall obtain prior clearance from the Radiation Safety Officer before permitting maintenance work to proceed on the following types of facilities:

1. Drains on sinks which are placarded with a radiation sign.
 2. Fume hoods bearing a radiation warning sign.
 3. Ducts and blowers which serve fume hoods bearing a radiation warning sign.
 4. Pits, pumps, and sewer systems in the Research Center building.
 5. Any other facility where there is any question as to the possible presence of radioactive contamination.
- C. In working within restricted areas, maintenance personnel shall remain outside any area which is roped off with a yellow and magenta or other radiation warning rope, unless accompanied by the authorized user who will be responsible for the area or by the Radiation Safety Officer.
- D. A current listing of all rooms having radiosotopes or radiation producing equipment will be sent to the Supervisors of all departments. This listing will be updated annually.
- E. Generally, safety practices to be followed in rooms containing radioactive materials will be given to all personnel using these materials or assigned to these rooms.

8. POSTING OF WARNING SIGNS

- A. All rooms or labs where radioisotopes are used or stored will display "Caution Radioactive Materials" signs on their doors as required in 10CFR 20.203. Generally these signs will mean that radioactive materials are present in shielded containers. The containers will be individually labeled and should not be touched or moved by personnel not specifically authorized to handle those materials and not acquainted with the precautions required to handle radioactive materials. All working areas in these rooms will be checked frequently for radioactive contamination and will be safe for work by cleaning, maintenance, or security personnel.

9. PERSONNEL MONITORING

Urine sample counting using scintillation countes will be done for those persons working with carbon 14, tritium and/or sulfur 35 at activities greater than 10 microcuries.

The quantities of tritium which will be used are much less than those for which bioassay is required. However, every pecaution will be taken to prevent exposure of personnel to the radiosotopes.

10. LEAK TESTS

Leak tests on the sealed source contained in the gas chromatograph will be performed on a semiannual basis. This test will be performed by standard smear test procedures. A counter capable of detecting at least 0.005 uCi will be used.

ITEM 11: WASTE MANAGEMENT

The following provision applies to disposal of aqueous solutions of radioactive materials:

Aqueous solutions of radioactive materials can be disposed of through chemical drains provided that total quantity disposed of is less than 100 uCi/day.

The average daily water use of the Bushy Run Research Center is 9.13×10^7 ml. Disposal of this quantity of radioactivity (100 uCi) would increase the background radiation by 2.4 dpm/ml. This level of radiation cannot be reliably detected by procedures used in our laboratory.

Samples of effluent water from the treatment plant will be monitored by liquid scintillation counting on a monthly interval, when radioactive compounds are disposed. The concentration of radioactivity will not be permitted to exceed 2.3×10^{-6} microcuries/ml (5 microcuries/ml), the lowest detectable level by procedures used in our laboratory.