

## 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 12-064-91-2

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

Ghanshyam N. Pandey, Ph.D., Research Dept.  
Illinois State Psychiatric Institute  
1601 West Taylor Street  
Chicago, Illinois 60612

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

Illinois State Psychiatric Institute  
1601 West Taylor Street  
Chicago, Illinois 60612

### 4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Ghanshyam N. Pandey, Ph.D.

### TELEPHONE NUMBER

312-996-1065 or 1330

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.

### 10. RADIATION SAFETY PROGRAM

### 11. WASTE MANAGEMENT.

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

AMOUNT  
FEE CATEGORY State Agency ENCLOSED \$ none

### 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

### TYPED/PRINTED NAME

Ghanshyam N. Pandey

### TITLE

Director, Biological  
Research Laboratories

### DATE

9/29/84

### 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

#### FEE LOG

#### FEE CATEGORY

#### COMMENTS

#### APPROVED BY

#### AMOUNT RECEIVED

#### CHECK NUMBER

170.11(a)(9)  
**FEE EXEMPT**

#### DATE

9/13/84

8506100179 850510  
REG3 LIC30  
12-06491-02 PDR

Control No. 77418

## 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

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE, \$300

FIRST CLASS MAIL  
POSTAGE & FEES PAID  
USNRC  
WASH D C  
PERMIT No. 667

ILLINOIS STATE PSYCHIATRIC INS  
RESEARCH DEPARTMENT  
1601 WEST TAYLOR STREET  
CHICAGO IL 60612

Item # 5.

Radioactive Material

Line No.	Element and Mass Number	Chemical and/or Form	Name of manufacturer and model number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
1.	Tritium-3	Foil	See attachment # 3	2,200 mc
2.	Nickel-63	Foil	"	32 mc
3.	Carbon-14	Any	NA	20 mc
4.	Tritium-3	"	"	1 Ci
5.	Iodine-125	"	"	10 mc
6.	Phosphorus-32	"	"	50 mc
7.	Rubidium-86	"	"	5 mc
8.	Calcium-45	"	"	5 mc
9.	Sulphur-35	"	"	20 mc

Item # 6.

Purpose(s) for which licensed material will be used.

1. Tritium-3 and Nickel-63 sealed sources are for use in the gas chromatograph units for detection purposes.
2. Other isotopes 3-9 listed in item # 5 are for use in in vitro experiments. Most of the in vitro isotopes used in in vitro experiments are for purposes of assaying enzymes, radioimmunoassay, assay of metabolites, etc. These isotopes are also used for in vivo experiments in small animals such as rats, mice, and guinea pigs.

Item # 7.

Training in radiation safety and experience of the individual users.

1. G. N. Pandey, Ph.D.

Dr. Pandey got his training in radiation safety (Item 16, a,b,c, and d) in the chemistry department, Temple University, Philadelphia, while working as Postdoctoral Research Fellow with Dr. James L. Bloomer, Associate Professor (1969-70). He was trained by Dr. Bloomer in the lab and also as a part of the course in biosynthesis of natural compounds. Dr. Pandey got further experience at the Veterans Administration Hospital, Philadelphia (1970-73), and the Illinois State Psychiatric Institute, Chicago (1973-79). He has worked with radioactive material for the last ten years.

Dr. Pandey has worked with C-14 (maximum .5 mc), H-3 (maximum 1 mc), I<sup>125</sup> (maximum .5 mc) at Temple University, Philadelphia; Veterans Administration Hospital, Philadelphia; and Illinois State Psychiatric Institute, Chicago. Dr. Pandey is Director, Biological Research Laboratories, and has been designated as Radiation Protection Officer.

2. John M. Davis, M.D.

Dr. Davis was trained in the use of radioactive material in a formal course (certificate attached). He has worked with radioactive material at NIH, VANDERBILT University, and Illinois State Psychiatric Institute, Chicago (C-14, 0.5 mc, H-3, 1 mc). He is currently Director of Research at ISPI.

3. J. I. Javaid, Ph.D.

Dr. Javaid got his training in the use of radioactive material in a formal course at the State University of New York, Buffalo (certificate attached). He worked with radioactive material at SUNY, Buffalo, and at ISPI, Chicago, since 1973). Maximum amount of radioactivity used, C-14 (0.5 mc), H-3 (1 mc).



4. B. D. Brown, B.S.

Mrs. Brown was trained by Dr. E. G. Brungrabber at Illinois State Psychiatric Institute, Chicago, and in the use of radioactive material. She has worked with radioactive material at ISPI from 1966 to the present. Maximum amount of radioactivity used (C-14, 0.5 mc, H-3, 1 mc, and I<sup>125</sup>, 0.5 mc).

5. R. Arora, Ph.D.

Dr. Arora received his formal training for the use of radioactive material from the Laboratory of Neurochemistry, University of Michigan, Ann Arbor, while working as a post-doctoral fellow. He worked there for 2½ years. After that he worked in the Department of Biochemistry, Chicago Medical School, for 3 years and used radioactive (<sup>14</sup>C, <sup>3</sup>H) material. He then joined the Department of Psychiatry, University of Chicago, and worked there with radioactive material for 2 years. Since 1977 he has worked in the Laboratory of Biological Psychiatry, Illinois State Psychiatric Institute, and works with radioactive material. He has about eight years of research experience in using radioactive material. He has used about a maximum of about 1 mc H-3 and 0.5 mc of C-14 at a time.

Item # 8.

Training for individuals working in or frequenting restricted areas.

All individuals working in the research laboratories, regardless of whether or not they are working with radioactive material, are provided with copies of the memos from the Radiation Protection Officer referring to

- (1) Radiation Safety Program, Item # 10,
- (2) Safety Instructions, Item # 10, attachment # 2,
- (3) Emergency Procedures, Item # 10, attachment # 3.

In addition, they are instructed by a staff member on the safety procedures. People working with radioactive material do so under the supervision of and after initial training by one of the individuals listed in Item # 7.

In general, they also attend the meetings called by the Radiation Protection Officer for training in and review of the radiation protection program.

Item # 9

Facilities and Equipment

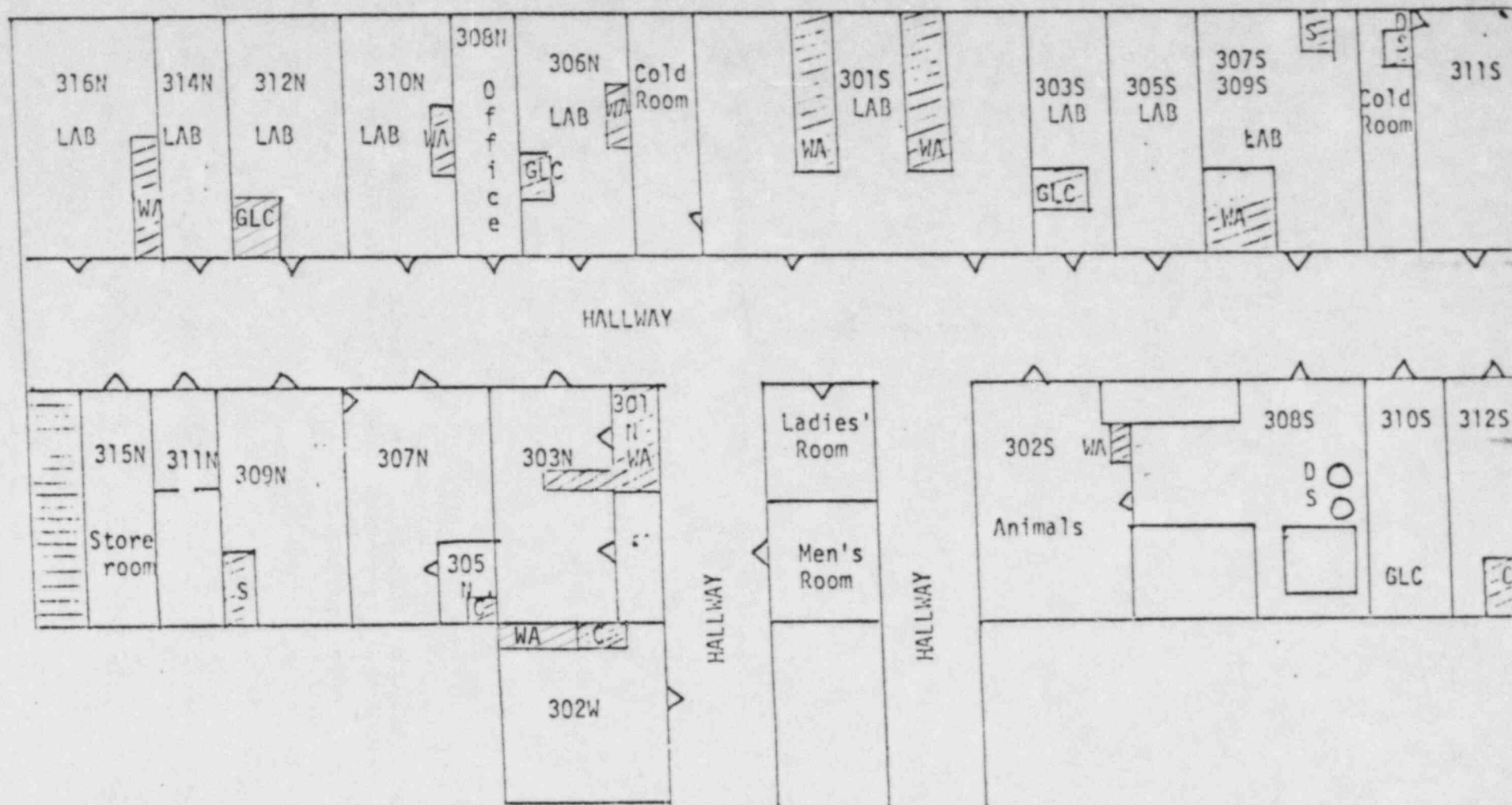
Radioactive material is used in the research laboratories that are located on the second and third floors of the Institute. A general plan of the working areas on the second and third floors is attached (see attachment # 1).

The location of sealed sources that are used in G.L.C. detector modules is also shown in the sketch. A list of sealed sources is provided in attachment # 2.



E  
Third Floor

N

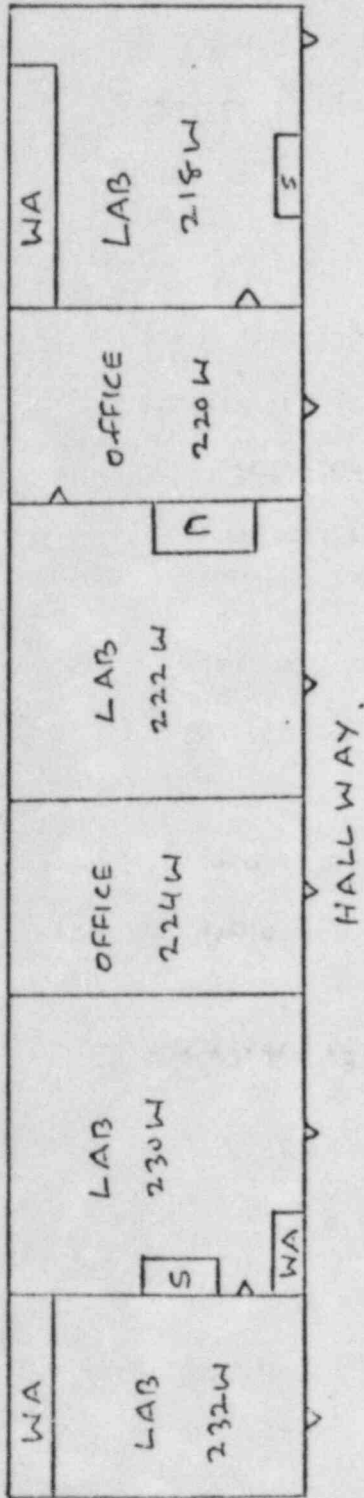


LEGEND:

- Storage of isotopes (309N, 307-9S)
- or Disposal of isotopes (storage of isotopic discard) (308S and cold room next to 311S)
- Working areas where concentrated isotopes are used (site injection of animals, dilution isotopes, etc) (301S, 307-9S, 301-3N, 302S, 306N, 310N, 316N)
- Site where counting is performed (305N, 302W)
- GLC with isotopic detectors (306N, 310S, 303S)

Item # 9

Second Floor



S → Storage of isotopes

WA → working area

C → site where counting is performed.

Sealed sources to be used in following instruments:

Foil  $H^3$  (US Radium Model Lab 508-1)  
in electron capture detector  
Packard series 800 (4 G.C.) detector modules (total of 8  
detectors, maximum 150 mc/detector  
1 cell, Sc plated nickel alloy that holds 1000 mCi  $^3H$  (for  
Varian Aerograph Series 2100),  
Total radioactivity  $H^3$ , 2200 mc (for all detectors)

$Ni^{63}$  Foil (NEN Model NER contained in Ionics Res. Inc. Model 150,  
detector cell for use in Bendix Model 2600-2 R.G.C.  
Foil (Hewlett Packard Detector cell Model 18 724 A) 15 mc

Item # 10

Radiation Safety Program

The radiation safety program is described in the form of a memo that has been given to all personnel using radioactive material (see attachment # 1).

The memo, which is also posted on the bulletin board, describes in detail

- (1) Responsibilities of the Radiation Protection Officer (RPO),
- (2) Procedures for procurement, storage, handling, and use of radioactive material,
- (3) Procedure for disposal of radioactive waste,
- (4) Procedure for survey and use of film badges,
- (5) General laboratory guidelines and exposure limits.

Also described in separate memos given to the personnel using radioactive material and posted on the bulletin board are

- (1) General laboratory safety instructions (see attachment # 2)
- (2) Emergency procedures (see attachment # 3)
- (3) Procedures for opening packages containing radioactive material (attachment # 4)
- (4) Procedures for receiving packages containing radioactive materials during off-duty hours (see attachment # 5)

Attachment 6 contains a list of radiation detection instruments, and Attachment 7 describes procedures for calibration of these instruments.

## MEMO

TO ALL LABORATORY PERSONNEL  
FROM G. N. PANDEY, PH.D.,  
RADIATION PROTECTION OFFICER  
RE: RADIATION SAFETY PROGRAM

DATE August 20, 1984

FACILITY ISPI

SPECIAL ATTENTION: DRS. JAVAID, ARORA, MRS. BROWN, MS. KUJOVICK, MS. MORGAN  
AND MRS. THOMAS.

A. Radiation protection officer (RPO) is responsible for:

1. Implementing and maintaining radiation protection services.
2. Maintaining records of all correspondence with Nuclear Regulatory Commission.
3. Providing adequate information and training to personnel relating to radiation protection procedures.
4. Supervising radiation emergencies.
5. Assigning responsibilities to laboratory supervisors and workers for the maintenance of radiation protection program.

B. Procurement and storage of radioactive material.

Authority to purchase radioactive material is limited to Drs. Pandey, Javaid, and Arora, Mrs. Brown, or to persons specifically assigned by the above named persons. Anyone purchasing or receiving radioactive material must notify Ms. Lubinka Kujovich, who has been assigned to keep records of the amount of isotopes under storage and waste. A monthly inventory of isotopes showing the information on amount and nature of isotopes received, under storage, use and disposal will be prepared by Ms. Kujovich, and the location of this record should be known by the RPO and Dr. Javaid. Persons purchasing and receiving isotopes must insure that the amounts of such radioactive material under storage, usage or waste does not exceed the amount we are permitted to possess at any one time.

In the event any radioactive material is procured as a loan or gift, the RPO must be informed for appropriate recording of such transfers.

Isotopes purchased and received by the research laboratories must be stored in the freezers located in Room 309N, 307-9S, or 230 W. They must be inspected when received for possible leakage and contamination.

C. Use of radioactive material.

All radioactive material must be used by or under the supervision of Drs. Pandey, Javaid, Arora, or Mrs. Brown. Any persons using the radioactive material must be trained, instructed and informed of its safe use by their supervisors (any one of the above named persons).



- C. 1. Working area. Specific areas have been designated for the handling of concentrated isotopes. Injection of animals or dilution of isotopes can be performed only in these areas. The areas designated are in rooms 310N, 301S, 307-9S, 309N, 306N, 303N, 302S, 230W and 218W (see room plans, Attachment #6).
2. Working surfaces. The bench top of the working area should be covered with absorbent paper with waterproof backing such as that available from Scientific Products. If any spillage occurs or if these papers are found to be contaminated, the papers can be disposed of by discarding them in the disposal barrel. Areas in which spillage has occurred must be washed with a brush and copious amounts of soap and water, until surveys reveal that contamination is under acceptable limits (less than 2,000 DPM per 100 cm<sup>2</sup> of wiped area).
3. Hoods. Work involving stirring, boiling vapors or any other operation during which radioactive materials are likely to become airborne must be performed in a hood with adequate ventilation.
4. Handling of animals. Handling of animals is the responsibility of the individual investigator. Radioactive animals are to be kept in cages labeled with the date of injection, the isotope and amount used, and the name of the investigator and radiation caution symbol. The animals are housed in room 302S. During the injection and subsequent handling of the animals, disposable plastic gloves are to be worn. Animal waste is collected in trays placed beneath the cages. These trays are emptied daily into plastic bags and stored until collected commercially (see item 4). Animal carcasses are placed in plastic bags and stored in labeled buckets in the freezer adjoining room 311S. The black, labeled, cylindrical buckets available in room 309S are used for this purpose. The carcasses will be removed by ADCO Services.

Cages are to be washed after each use using the sink in the animal room. Disposable gloves are used during this procedure.

5. Emergency procedures. All spills and other accidents with radioactive materials, regardless of magnitude, must be reported promptly to the supervisor responsible for the use of material and to the RPO. All personnel should withdraw from the area of immediate danger. Persons splashed with radioactive material should wash the affected area immediately with soap or a decontaminating agent. If the contamination is localized to small areas of the skin, the contaminated areas should be masked off and the affected areas cleaned with cotton applicators dipped in soap. Care should be taken not to scratch or erode the epidermal skin layer.
6. Display of radiation symbol. All areas in which isotopes are used (see attached floor plan) should have "Caution - Radioactive Materials" signs attached to doors in such a manner that they can be seen and read by all personnel and casual visitors. Freezers that contain stored isotopes should be so marked. Areas in which isotopes are counted should be marked. Rooms containing GLC equipment with isotopic detectors should be marked. The bulletin board in the hallway should have displayed in an unobscured position the AEC sign entitled "Notice to Employees -- Standards for Protection Against Radiation."

D. Disposal of radioactive waste.

One microcurie of any radioisotope having a half life greater than 30 days or 10 microcuries with half life less than 30 days may be disposed of via sink drains in radioisotope laboratories each day. All other radioactive wastes must be disposed of according to the following procedure. All solutions that contain isotopes and that must be discarded after counting or assay should first be placed in a leakproof container, such as a liquid scintillation vial, and should then be discarded in barrels available in room 308S. All other solid wastes, such as contaminated paper, etc., should be placed in those barrels. Animal wastes are disposed of as described in item C4. These barrels and radioactive carcasses will be removed periodically by ADCO Services. Ms. Morgan has been assigned to inform ADCO. Each user must report the amount of isotope disposed of to Ms. Kujovich, who will keep a record.

- E. Survey. A quarterly (every 3 months) survey throughout the laboratory must be performed using either the Geiger-Mueller counter or counting scrapings and samples from bench tops, floors, etc. All areas designated as isotopic handling areas (see floor plan) must be included in these surveys. Other areas should be spot-checked. Additional surveys will be conducted at other times under the discretion of the radiation officer. Any person suspecting contamination should report his suspicions to the radiation officer, who will initiate a survey. The results of all surveys, including periodic and emergency surveys, must be recorded in a book. This log must be available upon demand. Ms. Duslak will be responsible for these surveys and for maintaining the log book. Currently the program does not include an air sampling procedure. However, such a procedure will be instituted when radioactivity in escapable form is to be used.

F. Sealed sources.

Sealed sources are located in the GLC in room 306N, 303S, and 310 S. The Nuclear Regulatory Commission requires the performance of leak tests for sealed sources containing more than 100 microcuries of a beta or gamma emitter at 6 month intervals. The leak test is to be performed using the leak test kit (model No. 7000-348) manufactured by Packard Co. A leak test should also be performed when a leak is suspected. Dr. Javaid and Ms. Duslak have been assigned to perform these tests; reports of such tests should be recorded and filed with the RPO.

G. Bioassay.

Routine bioassay is required when the quantities of Tritium in volatile form or as nucleotide precursors or volatile I-125 used by an individual exceed a certain level (see table guidelines for bioassay requirements for Tritium and for I-125, regulatory guide 8-20). When an investigator plans such usage it is required that he inform the RPO and determine if a bioassay will be required. In case it is determined that a tritium bioassay is required, the user will submit to urine bioassay according to the schedule prescribed by the Nuclear Regulatory Commission for tritium and for thyroid count for I-125. At the moment we do not have a sensitive instrument for thyroid counting, but we are ordering one (model RM-19 with LEG-1 probe from Eberline Co.). Until this equipment arrives, thyroid count will be performed at the University of Illinois Circle Campus, if needed.

H. Film badges.

All employees in contact with radioisotopes should wear film badges supplied by the ICN Lab. Radiation exposure reports should be obtained monthly and filed by Ms. Kujovich. Ms. Thomas will arrange for purchase of the badges. The film badges supplied are sensitive to  $\beta$ (0.030 rem) and  $\gamma$ -radiation. If exposure to radiation exceeds the limits specified by the U.S. Nuclear Regulatory Commission Standard 10-1,10.101, appropriate measures should be taken in consultation with the RPO.

I. Records.

Records of inventory, waste, surveys and exposure should be maintained. This responsibility has been assigned to Ms. Kujovich.

J. Pregnancy.

The RPO must be notified in writing as soon as pregnancy is known so that the employee's supervisor can be directed to provide additional safeguards if necessary.

K. General Laboratory Guidelines.

1. Pipetting of radioactive solutions by mouth and the storage and consumption of food and beverages in radioisotope laboratories is prohibited.
2. Smoking and application of cosmetics in the radioisotope area is discouraged.
3. Lab coats should be worn while working with radioactive material. Protective gloves should be worn whenever operations are performed that may produce trend contamination.
4. No work with radioactive material that may give rise to airborne contamination may be performed on an open bench. Work performed on a bench will be conducted in such a manner that any spills will be contained and contamination will be controlled.
5. Any glassware in contact with radioactive material should be decontaminated according to specific procedures and should be washed separately from the uncontaminated glassware.

L. Exposure Limits.

No one will use or transfer radioactive material in such a manner as to cause any individual in any period of one calendar quarter to receive from radioactive material or other sources of radiation a dose in excess of the following:

Rems/calendar quarter

1. Whole body; head and trunk  
active blood forming organs,  
lens of eyes, or gonads . . . . . 1.25
2. Hands and forearms . . . . . 18.75
3. Skin of whole body . . . . . 7.50

M. It is understood that the above plans will require amendment from time to time as experimental plans change. Such changes will have to be approved by a Radiation Protection Officer.

N. All personnel are urged to attend Radiation Safety lectures when these are presented at the University of Illinois.

## ILLINOIS MENTAL HEALTH INSTITUTES

Item # 10  
Attachment # 2

## MEMO

TO ALL LABORATORY PERSONNELDATE August 20, 1984FROM G. N. Pandey, Ph.D.,  
RADIATION PROTECTION OFFICERFACILITY ISPIRE: RADIATION SAFETY PROGRAM  
GENERAL LABORATORY SAFETY INSTRUCTIONS

1. Pipetting of radioactive solutions by mouth and the storage and consumption of food and beverages in radioisotope laboratories is prohibited.
2. Smoking and application of cosmetics in the radioisotope area is discouraged.
3. Lab coats should be worn while working with radioactive material. Protective gloves will be worn whenever operations are performed that may produce trend contamination.
4. No work with radioactive material that may give rise to airborne contamination may be performed on an open bench. Work performed on a bench will be conducted in such a manner that any spills will be contained and contamination will be controlled.
5. Any glassware in contact with radioactive material should be decontaminated according to specific procedures and should be washed separately from the uncontaminated glassware.



## ILLINOIS MENTAL HEALTH INSTITUTES

Item # 10  
Attachment # 3

## MEMO

TO ALL LABORATORY PERSONNELDATE August 20, 1984FROM G. N. Pandey, Ph.D.  
RADIATION PROTECTION OFFICERFACILITY ISPIRE: RADIATION SAFETY PROGRAM, EMERGENCY PROCEDURES

(Phone number outside working hours: 627-1865)

1. In the event of an emergency, ALWAYS CALL FOR HELP FROM:
  - a. Other workers in the area,
  - b. The safety personnel,
  - c. Your supervisor.
2. Inform the Radiation Protection Officer. During off-working hours, the RPO can be reached at home at 627-1865. If the RPO cannot be contacted, call Dr. Javaid at home at 279-9607.
3. Know the locations and proper use of equipment such as eye wash station, showers and extinguishers in your area.
4. Minimize exposure and prevent spread of contamination.
  - a. Evacuate the immediate contaminated area to a safe location,
  - b. Remove grossly contaminated clothing,
  - c. Wash contaminated skin with flushing action,
  - d. Keep all persons involved in one area,
  - e. Follow instructions described in the radiation safety program.
5. When you use the phone to obtain help:
  - a. Tell who you are.
  - b. Tell where you are.
  - c. Tell what the problem is.



## ILLINOIS MENTAL HEALTH INSTITUTES

Item # 10  
Attachment # 4

## MEMO

TO ALL LABORATORY PERSONNELDATE August 20, 1984FROM G. N. Pandey, Ph.D.  
RADIATION PROTECTION OFFICERFACILITY ISPIRE: PROCEDURES FOR OPENING PACKAGES  
CONTAINING RADIOACTIVE MATERIAL

1. Visually inspect package for any sign of damage (e.g., wetness, crushed). If damage is noted, stop procedure and notify Radiation Safety Officer.
2. Measure exposure rate at 3 feet from package surface and record. If  $> 10$  mR/hr, stop procedure and notify Radiation Safety Officer.
3. Measure surface exposure rate and record. If  $> 200$  mR/hr, stop procedure and notify Radiation Safety Officer.
4. Put on gloves.
5. Open the outer package (following manufacturer's directions, if supplied) and remove packing slip. Open inner package to verify contents (compare requisition, packing slips, and label on bottle), check integrity of final source container (inspect for breakage of seals or vials, loss of liquid, discoloration of packing material). Check also that shipment does not exceed possession limits.
6. Wipe external surface of final source container with moistened cotton swab or filter paper held with forceps, assay and record.
7. Monitor the packing material and packages for contamination before discarding:
  - a. If contaminated, treat as radioactive waste
  - b. If not contaminated, obliterate radiation labels before discarding in regular trash.

## ILLINOIS MENTAL HEALTH INSTITUTES

Item # 10  
Attachment # 5

## MEMO

TO ALL LABORATORY PERSONNEL

FROM G. N. Pandey, Ph.D.  
RADIATION PROTECTION OFFICER

RE: PROCEDURE FOR RECEIVING PACKAGES  
CONTAINING RADIOACTIVE MATERIALS  
DURING OFF-DUTY HOURS

DATE August 20, 1984

FACILITY ISPI

The packages will be received by the security officer at the reception desk. The officer will then inform the nursing supervisor on duty, who will pick up the package and place it in the walk-in freezer located in room 301S. The package will be delivered to the appropriate person during the next working day.

These arrangements have been made in consultation with Ms. G. Middleton, chief of nursing staff, and the chief of security.

Radiation Detection Instruments

Line No.	Type of Instrument	Manufacturer's Name	Model Number	Number Available	Radiation Detected	Sensitivity Range	Location
(1)	Scintillation spectrometer	TM Analytic	6844	1	$\beta$	0-1X10 <sup>6</sup> cpm	Room 305N
(2)	"	TM Analytic	6848	1	$\beta$	"	Room 305N
(3)	"	TM Analytic	6881	1	$\beta$	"	Room 302W
(4)	"	Nuclear Chicago	1185	1	$\gamma$	"	Room 305N
(5)	"	Amersham	6868	1	$\beta$	"	
(6)	Survey meter	Victoreen	CDV-700#6A	1	$\beta$ & $\gamma$	12-3X10 <sup>4</sup> cpm	Room 301S
(7)	"	"	CDV-715#1A	1	$\gamma$	0-3X10 <sup>8</sup> cpm	Room 301S

Calibration of Instruments

1. The radiological Survey Meter Victoreen CD V-700 is calibrated before each use according to the instructions provided in the manual (copy attached). The instrument is also calibrated once a year by Nuclear Instrument Company, Rockland, Massachusetts.
2. No calibration is required for Victoreen Model CD V-715 #1A survey meter, but an operational check is required before each use.
3. Scintillation spectrometers are used for the quantification of radioactivity for experimental purposes or for counting samples for survey. They are calibrated according to the procedures described in the instruction manual. Since most of these instruments are also on contract maintenance, they are calibrated when repaired by the company. The sealed standard source is provided by the manufacturers. Details of the calibration procedure will be provided if required.
4. We are proposing to order another survey meter Eberline RM-19 with LEG-1 probe for the purpose of thyroid count and for survey.

Item # 11.

Waste Management.

One microcurie of any radioisotope having a half-life greater than 30 days or 10 microcuries with half-life less than 30 days may be disposed of via sink drains in radioisotope laboratories each day.

All other radioactive waste is disposed of in barrels according to the following procedure. These barrels are removed periodically by ADCO Services Inc., P. O. Box 35, Tinley Park, Illinois 60477.

All solutions that contain isotopes and that must be discarded after counting or assay are first placed in a leakproof container, such as a liquid scintillation vial, and are then discarded in barrels available in room 308S. All other solid wastes such as contaminated paper, etc., are placed in those barrels.

Animal Wastes.

Radioactive animals are to be kept in cages labeled with the date of injection, the isotope and amount used, and the name of the investigator and radiation caution symbol. The animals are housed in room 302S. During the injection and subsequent handling of the animals, disposable plastic gloves are to be worn. Animal waste is collected in trays placed beneath the cages. These trays are emptied daily into plastic bags and stored until collected commercially. Animal carcasses are placed in plastic bags and stored in labelled buckets in the freezer adjoining room 311S. The black, labeled, cylindrical buckets available in room 309S are used for this purpose. The carcasses will be removed by ADCO Services Inc.

Control No. 77418