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

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

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

Lovelace Clinic
5200 Gibson Blvd. S.E.
Albuquerque, New Mexico 87108

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

As in 1(a)
Also at Bataan Memorial Methodist Hospital
5400 Gibson Blvd. S.E. Albuquerque, N.M. 87108
(See attached letters)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Radiology

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

30-392-1,2,3,4

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

J. W. Grossman, M.D.

5. RADIATION PROTECTION OFFICER. *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

J. L. Howarth, Ph.D.

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

See Appendix A

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

For human use, for studies on lower animals, and for physical measurements relating to calibration and dosimetry.

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(Continued on reverse side)

Item 6

Any byproduct material between atomic numbers 3 and 83 inclusinve in any chemical or physical form up to 20 mCi each together with the following isotopes in any chemical or physical form up to the amounts stated:

Hydrogen-3	1 Ci
Iodine-125	100 mCi
Iodine-131	500 mCi
Krypton-85	2 Ci
Molybdenum-99	1 Ci
Strontium-90	105 mCi
Technetium-99m	1 Ci
Xenon-133	2 Ci

These amounts include specifically 100 mCi of strontium-90 sealed sources. The total amount of byproduct material to be held at one time will not exceed 10 Ci. The procurement limit requested for hydrogen-3 is 5 Ci.

Form AEC-313 Appendix B

Item 8

(a) J. W. Grossman, M.D.

Training, both formal courses and on the job training, as follows: Training in radiology - University of Illinois and Michael Reese Hospital, Chicago, Illinois - 4 years Oak Ridge Institute of Nuclear Studies - One month (Items a,b,c, and d)
Donner Laboratory, Berkeley - Two weeks (Items a,b,c, and d)
Wadsworth V.A. Hospital, Los Agneles - Two weeks, and Harper Hospital, Detroit - Three days (Items b,c, and d)
In charge of Nuclear Medicine program at Lovelace Clinic since its inception in 1949.

(b) J. L. Howarth, Ph.D.

On the job training in all branches of radiological physics including radiation protection, dosimetry, measurements and calculations relating to radioactivity and nuclear medicine,and radiation biology at Sheffield National Center for Radiotherapy, England (7 years), formal course (2 months) in radiation biology atStrangeways Research Laboratory, Cambridge, England. In charge of radiological physics at Lovelace Clinic since 1953.

Form AEC-313 Appendix C

Item 9

(a) J. W. Grossman, M.D.

Experience during training (see item 8) and at the Lovelace Clinic with varied medical research, diagnostic and therapeutic uses for 22 years including the following isotopes in the amounts indicated: ^{131}I (200 mCi), ^{32}P (100 mCi), ^{51}Cr (5 mCi), ^{59}Fe (2 mCi), ^{57}Co (100μCi), ^{60}Co (100μCi plus 4800 Ci sealed sources) ^{3}H (400 mCi), ^{24}Na (10 mCi), ^{42}K (10 mCi), ^{203}Hg (20 mCi), ^{90}Sr (100 mCi), ^{85}Sr (5 mCi), ^{99}Mo-^{99m}TC (1 Ci), and other isotopes for calibration purposes.

(b) J. L. Howarth, Ph.D.

Experience with medical uses of: ^{131}I (500 mCi), ^{32}P (50 mCi), ^{198}Au (200 mCi), ^{24} Na (10 mCi), at the Sheffield National Centre for Radiotherapy, England, for seven years. Experience at Lovelace Clinic with medical uses of isotopes and physical measurements for sixteen years including the following: ^{140}Ba-^{140}La (5 mCi), ^{144}Ce-^{144}Pr (5 mCi), ^{137}Cs (5 mCi), ^{57}Co (100μCi), ^{60}Co (100μCi plus 4800 Ci sealed sources), ^{51}Cr 5 mCi), ^{59}Fe (2 mCi), ^{3}H (400 mCi), ^{203}Hg (20 mCi), ^{131}I (200 mCi), ^{42}K (10 mCi) ^{24}Na (10 mCi), ^{32}P (100 mCi), ^{106}Ru (5 mCi), ^{85}Sr (5 mCi), ^{90}Sr (100 mCi), ^{99}Mo-^{99m}Tc (1 Ci), ^{132}Te-^{132}I (5 mCi), ^{3}H (400 mCi).

Form AEC-313 Appendix D

Items 10 and 11

(a) 2 Picker Magnascanners (3" dia. crystals)

(b) 1 Picker dual probe scintillation detector (1 1/2" dia. crystals) with dual ratemeters and recorders.

(c) 3 Nuclear-Chicago well scintillation detectors with scalers, one with single channel analyser, one with dual channel analyser and automatic sample changer.

(d) 1 Tri-Carb liquid scintillation system.

(e) 1 Nuclear-Chicago β-γ monitor with range of G-M probes.

(f) 1 Portable scintillation monitor

(g) 1 Victoreen condenser r-meter with range of ionization chambers

(h) 1 Victoreen Minometer with range of ionization chambers.

(i) 1 Picker Dynacamera (on order)

a,b,c,d are used for clinical measurements, e,f, and h for surveying and monitoring. g is the laboratory standard, against which e,f, and h may be calibrated as required. (It is calibrated approximately yearly either at the National Bureau of Standards or by the manufacturer). Since our clinical measurements are relative, absolute calibrations of a,b,c,d have not been necessary. Standardization is achieved by the use of laboratory standard sources as required, normally daily.

Appendix E

RADIATION PROTECTION PROGRAM AND WASTE DISPOSAL PROCEDURES

1. The Radiation Protection Officer is responsible for supervising the safety aspects of the radioisotope program. He will devise appropriate procedures for handling, storage and disposal of radioactive materials and will issue appropriate instructions to personnel. He will ensure that at all times the provisions of 10 CFR 20 are adhered to. He will assess all proposals for new uses of radioactive materials from the safety point of view and make recommendations to the Medical Isotopes Committee.

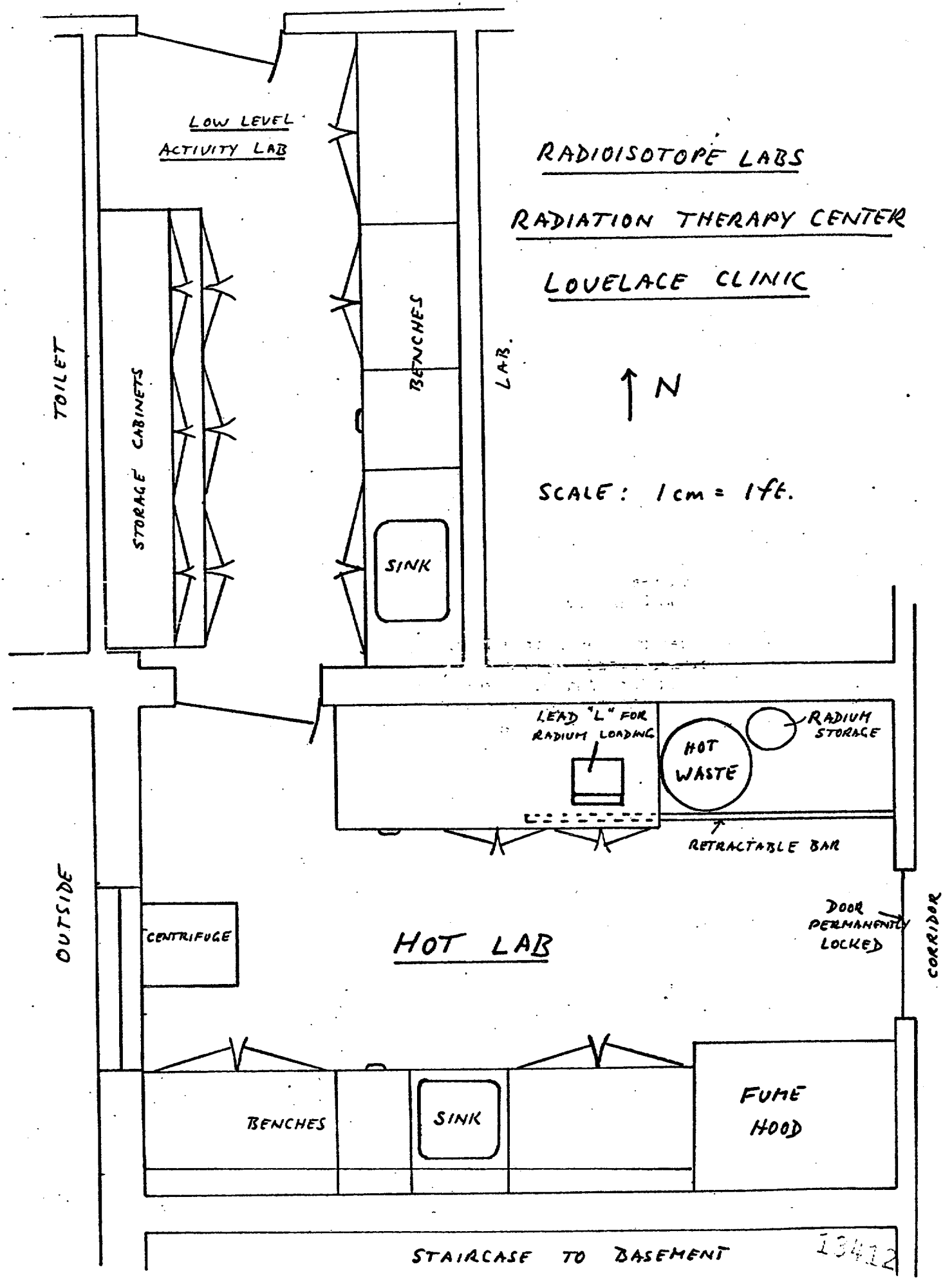
2. Radioisotopes are ordered by a secretary on instructions from individuals specifically designated by the Medical Isotopes Committee(currently Dr. Grossman, Dr. Butler, Dr. Howarth). On receipt shipments are opened, checked and stored behind suitable shields in the hot lab.

3. Records of receipt, use and disposal of radioisotopes will be kept in compliance with the provisions of 10 CFR 20. Surveys of radiation areas will be made after use of isotopes and if any evidence of contamination is found, proper decontamination procedures will be carried out and records kept. In any case the results of a survey will be recorded at least once a week.

4. Liquid wastes of up to 1 mCi per day of short lived (less than 1 month) isotopes are disposed of in the sink in the hot lab. Solid wastes are stored in labelled containers and either (a) stored until a survey meter indicates no significant radiation level above background and then disposed of in normal trash, or (b) in the case of long lived isotopes or of larger quantities, disposed of through the agency of Mr. Stanley Waligora, health physicist, making use of the facilities of the Lovelace Foundation's A.E.C. Project 1013.

5. A sketch of the hot lab and adjacent preparation room is attached. Only low levels of activity, e.g., blood and other specimens from patients receiving isotopes, are handled in this preparation room. Appropriate lead shields, storage containers, and remote handling equipment are available in the hot lab.

6. Copies of current radiation safety instruction sheets are attached.


LOW LEVEL
ACTIVITY LAB
TOILET
STORAGE CABINETS
BENCHES
LAB.
SINK
RADIOISOTOPE LABS
RADIATION THERAPY CENTER
LOVELACE CLINIC
N
SCALE: 1 cm = 1 ft.
LEAD "L" FOR RADIUM LOADING
HOT WASTE
RADIUM STORAGE
RETRACTABLE BAR
OUTSIDE
CENTRIFUGE
HOT LAB
DOOR PERMANENTLY LOCKED
CORRIDOR
BENCHES
SINK
FUME HOOD
STAIRCASE TO BASEMENT
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SECTION OF NUCLEAR MEDICINE

RULES FOR HANDLING RADIOACTIVE MATERIALS

1. These rules are for three purposes:

   (a) To reduce the hazard to patients and personnel from external radiation from radioactive sources.

   (b) To avoid the danger of ingestion of radioactive material.

   (c) To avoid radioactive contamination of equipment, which would invalidate the results of measurements.

2. When packages of radioactive material are received, they should be taken to the hot lab, unpacked, checked for spillage, and placed in the appropriate storage area. A record sheet should be started for that shipment, normally by sticking the label from the isotope container on to the sheet. All use of the material, disposal and transfer to other authorized users must be recorded on this sheet.

3. High activity (millicurie-level therapy doses and radioactive material received from the supplier) and intermediate activity (tracer doses before administration) material should be handled only in the hot lab (except when being carried, if necessary, to the patient); low activity material may be handled in the low activity laboratory. The dividing line is set at 5 mCi.

4. There is an external radiation hazard in handling millicurie-level sources and in dispensing tracer doses from stock solutions. The appropriate shielding and remote handling tools must always be used. Remember that distance and speed of working are as important methods of protection as shielding. Work as quickly as possible but without hurrying, and keep as far away from source as possible. Treat small millicurie-level sources as if they were red-hot!

5. Wear plastic gloves when handling liquid samples of more than 25 mCi activity and when washing contaminated glassware. Benches must be covered with absorbent paper. Wash hands thoroughly after removing gloves (discard in hot waste container) and monitor hands, clothing and bench top with beta-gamma monitor with shield open.

6. Do not eat, drink or smoke in the radioactive laboratories.

7. As far as possible, keep the glassware for each technique in separate lots to avoid contamination. Wash glassware as soon as possible after use.

8. Disposal of short-lived (less than 50 days) isotopes in amounts up to 100 mCi per day may be made in the sink in the hot lab. Wash the material down with a large amount of water. Solid wastes (paper cups, tissues, syringes, gloves, bottles, etc.) should be placed in the appropriate containers and disposed of on instructions from the radiation protection officer.

9. Normally no special instructions for disposal of excreta need be given to patients.

10. When hospitalized patients are given therapy doses, the form "Nursing Instructions for Patients receiving Therapeutic Doses of Radioactive Materials", filled out by the physician administering the dose or by the radiation protection officer must be attached to the patient's chart before he is returned to the hospital.

NURSING INSTRUCTIONS FOR PATIENTS RECEIVING THERAPEUTIC DOSES OF RADIOACTIVE MATERIALS

Patient's Name _____

This patient received _____ mCi of _____
(isotope)

on _____ at _____ a.m. p.m.

_____
(name of physician)

1. If patient's clothes or bed linens are contaminated by fluids originating in the patient, place them in a plastic bag and notify radiation therapy center (ext.343).

2. Wear disposable plastic gloves while handling contaminated objects. Place gloves in plastic bag and notify radiation therapy center. Wash hands thoroughly.

3. Nurses or other attendants must not remain in immediate proximity of the patient for more than a total of _____ hours during _____
(period)

4. Visitors must be warned to stay at least five feet from the patient during their visit and visits must be limited to _____ hours per day.

5. Unless otherwise indicated below, all excreta may be disposed of in the normal manner.

6. In the event of patient's death, notify physician named above and the radiation therapy center immediately. Do not remove the body from the room until appropriate instructions are received.

7. Special instructions:

Appendix F

MEDICAL ISOTOPES COMMITTEE

I. Committee Authority

The committee is established by authority of the Board of Governors as the administrative body responsible for the safe use of radioactive materials within the institution.

II. Comittee Membership

Members of the committee are:

J. W. Grossman, M.D. (Chairman). Chief, Department of Radiology. In charge of nuclear medicine program since 1949. For summary of training and experience see supplemental sheet No.2.
J. L. Howarth, Ph.D. (secretary). Radiological Physicist. For summary of training and experience see supplemental sheet No. 2.
Bruce M. Wimer, M.D. Hematologist. Experience in clinical use of radioisotopes in hematology at Gutherie Clinic, Sayre, Pennsylvania (1953-59) and at Lovelace Clinic since 1963.
Thomas L. Chiffelle, M.D. Pathologist. Experience with radioisotopes in connection with nuclear weapons testing at A.E.C. Nevada Test Site since 1953, and with inhalation fission products effects at Lovelace Foundation's A.E.C. 1013 facility since 1963.
Donald E. Butler, M.D. Resident in Radiology. Experience in nuclear medicine at Lovelace Clinic since 1967.

III. Responsibilities of the Committee

1. The committee will exercise general control over all clinical and experimental uses of radioisotopes.
2. The committee will establish policies for the safe use of radioisotopes and for record keeping and will review all applications for new procedures. When such applications are approved the committee will establish any necessary conditions for the safety of patients and personnel.
3. The committee will authorize the procurement of radioisotopes for approved procedures.
4. The committee will receive and review records and reports from the radiological safety officer and recommend any action to be taken to maintain proper health safety practices.
5. The committee will formulate and review institutional training programs for safe use of radioisotopes.
6. The committee will inform the A.E.C. of cahnges in its membership.

IV. Administrative Procedures

1. The committee will meet at least twice a year and additionally whenever necessary in the opinion of the chairman to review applications or for any other business. A majority of the membership shall constitue a quorum.
2. The committee will delegate to appropriate qualified individuals the responsibility for day-to-day operation of the isotopes program, for radiological safety and for record keeping. It will require periodic reports from these individuals.
3. The committee will use Appendicies C and F of the A.E.C. Licensing Guide Medical Programs as guides in reviewing proposals for uses of radioisotopes.
4. The secretary will keep minutes of all meetings and circulate copies to members.