VICTORIA

GOVERNMENT GAZETTE

Published by Authority

[*Registered at the General Post Office, Melbourne, for transmission by post as a newspaper.*]

No. 56] MONDAY, JUNE 29 [1959

DEPARTMENT OF HEALTH, VICTORIA.—COMMISSION OF PUBLIC HEALTH.

At the Executive Council Chamber, Melbourne, the nineteenth day of May, 1959.

PRESENT:

His Excellency the Governor of Victoria.

Sir Thomas Maltby | Mr. Reid.
Mr. Porter |

REGULATIONS RELATING TO IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES.

WHEREAS the manufacture and use of radio-active substances and the use of irradiating apparatus may endanger or is likely to endanger the public health and the health of persons engaged in the manufacture and use of such substances or in the use of such apparatus: Now therefore by virtue of the powers conferred by section 108 of the *Health Act* 1959 (No. 6270) and all other powers enabling him in that behalf, His Excellency the Governor of the State of Victoria, by and with the advice of the Executive Council of the said State, doth hereby make the Regulations following (that is to say):—

PART I.—PRELIMINARY.

1. These Regulations may be cited as the Irradiating Apparatus and Radio-active Substances Regulations 1959, and shall be divided into Parts as follows:—

Part I.—Preliminary (Regulations 1-3).
Part II.—Exemptions (Regulation 4).
Part III.—Licences (Regulations 5-10).
Part IV.—General Safety Precautions (Regulations 11-17).
Part V.—Maximum Permissible Dose (Regulations 18-19).
Part VI.—Monitoring (Regulations 20-26).
Part VII.—Storage of Radio-active Substances (Regulations 27-28).
Part VIII.—Control of Radio-active Contamination (Regulations 29-32).
Part IX.—Labelling (Regulations 33-34).
Part X.—Transport of Radio-active Substances (Regulations 35-54).
Part XI.—Disposal of Radio-active Wastes (Regulation 55).
Part XII.—Medical Examinations (Regulation 56).
Part XIII.—Penalty (Regulation 57).

No. 56.—4382/59.—PRICE 1S. 6D.

2. The Regulations shall come into operation immediately on their publication in the *Government Gazette*: Provided that a person who has an irradiating apparatus or radio-active substance in his possession at the time of such publication shall not during a period of six months from such publication be guilty of an offence by reason only that he has not obtained a licence under these Regulations in respect of such substance or apparatus.

3. In these Regulations unless inconsistent with the context or subject-matter—

"Absorbed dose" of any radiation means the amount of energy imparted to matter by ionizing particles per unit mass of irradiated material at the place of interest and shall be expressed in rads as refined in these Regulations.

"Body burden" means the amount of radio-active material in the human body at the time of interest.

"Commission" means the Commission of Public Health.

"Critical organ" means that part of the human body that is most susceptible to damage by radiation under the specific conditions at the time of interest.

"Curie" means the quantity of any radio-active substance in which the number of disintegrations per second is $3{\cdot}700 \times 10^{10}$ and in these Regulations may be denoted by the symbol "c".

"Film Badge" means a pack of photographic film and appropriate filters used for the detection of exposure to radiation.

"Fluorescence" means the phenomenon involving the absorption of radiant energy by a substance and its re-emission during the period of absorption as visible radiation.

"Fluoroscope" means equipment containing a screen of material which fluoresces when irradiated with X-rays.

"Installation" means the area of radiation hazard under the administrative control of the person or organization possessing the source of radiation.

"Irradiating apparatus" means apparatus capable of producing ionizing radiation.

"Licensee" means a person licensed under these Regulations.

"Microcurie" means the one-millionth part of a "curie" and may be designated in these Regulations by the symbol "uc".

"Microrontgen" means the one-millionth part of a rontgen and may be designated in these Regulations as "ur".

"Millicurie" means the one-thousandth part of a "curie" and may be designated in these Regulations by the symbol "mc".

"Millirem" means the one-thousandth part of a "rem" and may be designated in these Regulations as "mrem".

"Millirontgen" means the one-thousandth part of a rontgen, and may be designated in these Regulations as "mr".

"Person" includes a corporation.

"Personnel dose" means the dose of radiation received by a person or persons.

"Personnel Monitoring" means continuous or periodic measurement of the personnel dose of radiation.

"Rad" means that amount of energy imparted to matter by ionizing particles which produce energy equal to one hundred ergs when applied to a mass of one gramme of irradiating material at the place of exposure.

"Radiation" or "Ionizing Radiation" means energy that is propagated in the form of X-rays, gamma rays, alpha and beta particles, high speed electrons, neutrons, protons and other nuclear particles, and includes:—

(i) "Primary radiation" which means radiation coming directly from a radio-active substance or irradiating apparatus;

(ii) "Secondary radiation" which means radiation other than primary radiation that is emitted by any matter irradiated by primary radiation;

(iii) "Scattered radiation" which means radiation which during passage through a substance has been deviated in direction, notwithstanding that it may have been modified by an increase in wave length, including—

(*a*) "Side scattered radiation", that is radiation which is scattered in directions approximately at right angles to the direction of the primary beam;

(*b*) "Back scattered radiation", that is radiation which is scattered in directions approximately opposite to the direction of the primary beam;

(iv) "Useful beam" which means that part of the primary and secondary radiation which passes through the aperture cone or other device for collimating the beam of radiation;

(v) "Leakage radiation" which means all primary radiation except the useful beam;

(vi) "Stray radiation" which means radiation not serving any useful purpose and includes leakage radiation and secondary radiation from irradiated objects;

but it does not include energy propagated by means of sound or radio waves or visible rays or infra red rays or ultra violet rays.

"Radiation hazard" means the danger to health arising from exposure to ionizing radiation whether such danger is due to radiation arising from sources outside the human body or to radiation from radio-active substances within the body.

"Radiation survey" means an investigation of those factors associated with an installation or process which could give rise to a radiation hazard.

"Rem" means the absorbed dose of any ionizing radiation which has the same biological effectiveness as one rad of radiation with average specific ionization of one hundred ion pairs per micron of water in terms of air equivalent in the same region. A dose in rems may be calculated by multiplying the dose in rads by the appropriate relative biological effectiveness value as set out in Part I. of the Third Schedule.

"Rontgen" means the unit of dose of X and gamma rays but not other ionizing radiation and it shall be deemed to be the quantity of X or gamma radiation such that the associated corpuscular emission per 0·001293 grammes of air produces, in air, ions, carrying one electro-static unit of quantity of electricity of either sign.

"Sealed source" means a radio-active substance which is permanently enclosed in a container in such a manner that it or any part of it cannot be separated from the container unless the container is damaged, but at the same time radiation may be permitted to come out for use.

"Sell" includes sell (whether by wholesale or retail) and barter or exchange; and also agreeing to sell or offering or exposing for sale or keeping or having in possession for sale or sending, forwarding, delivering or receiving for or on sale or authorizing, directing, causing, suffering, permitting or attempting any of such acts or things; and "sale" has a corresponding interpretation.

"Site monitoring" means the continuous or periodic measurement of the dose rate at the place of interest.

"Substance" means any natural or artificial substance whether in solid or liquid form or in the form of a gas or vapour and includes any article or compound whether it has or has not been subject to any artificial treatment or process.

PART II.—EXEMPTIONS.

4. (1) The radio-active substances specified in the First Schedule in quantities not greater than specified therein shall be exempt from the provisions of these Regulations.

(2) The Commission may exempt from all or any of these Regulations any radio-active substance or any irradiating apparatus which it considers to be without significant hazard and it shall authorize the labelling of apparatus or substances so exempted.

PART III.—LICENCES.

5. No person shall (otherwise than as a servant or employee of a licensee)—

(*a*) have in his possession;

(*b*) use;

(*c*) sell;

(*d*) transport;

(*e*) store or dispose of by any means—

any radio-active substance unless he is the holder of an appropriate licence issued under these Regulations.

6. No person shall (otherwise than as a servant or employee of a licensee)—

(*a*) have in his possession; or

(*b*) use;

any irradiating apparatus unless he is the holder of an appropriate licence issued under these Regulations.

7. (1) For the purposes of and subject to these Regulations the Commission may issue licences authorizing—

(*a*) the possession, use, sale, transport, storing and disposal by any means of any radio-active substance or substances; or

(*b*) the possession or use of any irradiating apparatus.

(2) Every application for a licence or renewal of a licence under these Regulations shall be made to the Commission in the form or to the effect of the appropriate form in the Second Schedule to these Regulations.

(3) A licence shall remain in force for a period of one year and may be renewed from time to time.

8. The Commission shall cause to be kept a Register of Licences issued under these Regulations.

9. The Commission may cause inspections to be made of any place where irradiating apparatus or radio-active substances are kept or where it is suspected that such apparatus or substances are or may be kept.

10. Any officer or person authorized by the Commission may at any reasonable time enter any such place and may inspect that place and test any substance or apparatus and may take samples of any substance for analysis or other examination.

PART IV.—GENERAL SAFETY PRECAUTIONS.

11. Every licensee shall, in addition to any other responsibilities imposed by these Regulations, maintain radiation safety in the installation and in particular shall—

(*a*) inform himself of the hazards attendant upon the presence of radiation in the installation;

(*b*) provide, or cause to be provided any necessary instructions concerning radiation hazards and safe working practices—

(i) to all employees whose duties necessitate the handling of radio-active substances or the operation of any irradiating apparatus that produces radiation hazard; and

(ii) to all other employees who are not regularly employed at such work, but who may occasionally be exposed to radiation;

(*c*) ensure that all persons working with irradiating apparatus or radio-active substances, and all authorized visitors to areas where radiation may be present, are properly and adequately instructed in the use of all necessary safeguards and procedures, and are supplied with such auxiliary devices as may be necessary for safety;

(*d*) ensure that no radio-active substance (including that in patients, animals or equipment) is allowed to leave his control under circumstances that may subject other persons to radiation in amounts in excess of those indicated in these Regulations;

(*e*) ensure that any area, inside or outside the installation, that may be habitually occupied by persons not engaged in radiation work, cannot be subjected to radiation levels exceeding one-tenth of the maximum permissible dose indicated in these Regulations.

(*f*) notify the Commission of the existence of any areas not normally occupied but in which a radiation hazard may take place;

(*g*) notify the Commission of the existence of any conditions or situations that, while not normally considered a radiation hazard, may become a radiation hazard under special or unusual circumstances;

(*h*) by means of appropriate surveying or monitoring procedures ensure that radio-activity discharged to the atmosphere shall at any point where persons may breathe the air be maintained at an average concentration of radio-activity below the maximum permissible dose indicated in these Regulations;

(*i*) notify the Commission if he becomes aware of the existence of a radiation hazard on his premises apparently not originating from sources within his premises.

12. When a radio-active substance is used at an area located away from the premises of the person licensed under these Regulations he shall cause the area in which the substance is being used to be fenced or otherwise guarded to prevent entry of unauthorized persons.

13. When a radio-active substance has been used at an area located away from the premises of the person licensed under these Regulations, and it is impracticable for the substance to be returned immediately to the premises, the licensee shall arrange for its safe custody at the area and for the display of notices hereinafter prescribed in the area.

14. When a radio-active substance is being used at an area located away from the premises of the person licensed under these Regulations, the licensee shall ensure that the substance has been placed in the storage container before the area is vacated, and that it is within the container when the latter is returned to the premises where it is normally stored.

15. When a radio-active substance is being used at an area located away from the premises of the person licensed under these Regulations, diagrams and/or photographs with dimensions and identifying features of the container of the substance, and the steps to be taken by any person finding such a container, shall be conspicuously displayed at the area where the substance has been used until the substance is removed from the area.

16. Every employee of a licensee and authorized visitor shall use such safety devices as are furnished for his protection and shall carry out all radiation-safety regulations that concern or affect his conduct.

17. In the event of the loss of, or damage to a radio-active source, the licensee shall notify such loss or damage immediately by telegram, or telephone to the Commission.

Part V.—Maximum Permissible Dose.

18. (1) The maximum permissible dose of radiation shall be at the rate of 100 millirems per week: Provided that where it can be shown from records kept pursuant to these Regulations that the

average weekly dose of radiation over the period of employment does not exceed in respect of the organs set out hereunder any one of the limits specified:—

(*a*) The blood-forming organs, the gonads or the lenses of the eyes, 100 millirems;

(*b*) the thyroid gland or the skin except the skin of the hands and forearms, feet and ankles, 600 millirems;

(*c*) the skin of the hands, the forearms, feet and ankles, 1,500 millirems;

the maximum permissible dose shall be deemed not to have been exceeded.

(2) The maximum permissible dose for an individual shall include all doses from internal and external sources, from all types and energies of radiation whether delivered simultaneously or successively to the region of interest during the period of measurement.

19. No person shall possess, use, sell, store, transport or dispose of in any way any radio-active substance or irradiating apparatus in circumstances where a person may receive radiation in excess of the maximum permissible dose prescribed in these Regulations, or possess, use, sell, store, transport or dispose of in any way any radio-active substance or irradiating apparatus contrary to these Regulations: Provided that nothing in these Regulations shall be construed as limiting in any way the dose of radiation which may be given in the course of diagnosis or treatment of any disease, ailment or condition or suspected disease, ailment or condition.

Part VI.—Monitoring.

20. The Commission may at intervals cause to be made radiation surveys of all areas in the vicinity of radiation producing sources to determine the extent to which persons are or could be exposed to radiation.

21. (1) Every person likely to be exposed to radiation—

(*a*) who is licensed under these Regulations;

(*b*) who is in the employ of a person licensed under these Regulations; or

(*c*) who is in any work area, vehicle, ship, aircraft store or depot under the control of the licensee—

shall wear a film badge or other approved monitoring device and every film badge or device so worn shall be submitted by the licensee to the Commission for checking immediately after use if the period of use is less than one week or in the case of a greater period of use at intervals of one week or such greater intervals of time as the Commission in a particular case may specify in writing.

(2) Every licensee shall supply film badges or other approved monitoring devices to persons in respect of whom he is required to submit film badges or approved monitoring devices to the Commission pursuant to this Regulation.

22. Every licensee shall keep in respect of each person in his employ whose occupation exposes him to radiation a record of all measurements made pursuant to the preceding Regulation and shall include therein any accidental personnel dose known or believed to have been received and particulars of any personnel dose which exceeds that permitted in these Regulations.

23. Every licensee shall keep accurate records of the kinds, movements and dispositions of all radio-active substances received, kept, sold or used by him or under his direction.

24. All records kept pursuant to these Regulations shall be available at all times for inspection by duly authorized officers of the Commission.

25. On the termination of employment of a person who has been exposed to radiation the employer shall report such termination to the Commission and forward to the Commission within fourteen days the record of such person kept pursuant to these Regulations.

26. (1) When any licensee knows, believes or suspects that an accidental dose received by a person in any installation may have exceeded five times the dose permitted by these Regulations all facts relevant to the occurrence shall be reported in detail to the Commission within 48 hours of the discovery thereof and a copy of the report shall be put in the appropriate personal record.

(2) The cause of the over-exposure to radiation mentioned in the preceding sub-regulation shall immediately be sought out and corrected by the licensee.

PART VII.—STORAGE OF RADIO-ACTIVE SUBSTANCES.

27. When there is any possibility that chemical, radiation or other action might weaken or rupture the container of a radio-active substance sufficiently to cause leakage therefrom, or where the Commission so directs, the container shall be provided with a suitable secondary tray or catchment to retain the entire amount of radio-active substance.

28. Each container of radio-active substance in storage shall in addition to the standard radiation hazard symbol as specified in the Fifth Schedule to these Regulations be labelled in such a manner that the kind and quantity of substance, the date of measurement, and the name of the person responsible for the custody of the substance can be easily and quickly determined.

PART VIII.—CONTROL OF RADIO-ACTIVE CONTAMINATION.

29. (1) When the nature of the work is such that a person or his clothing may become contaminated to such a degree as to present a radiation hazard the person and his clothing shall be frequently monitored.

(2) When a person or his clothing becomes contaminated to such a degree as to be likely to cause radiation doses in excess of those permitted by these Regulations he shall remove such contamination or the contaminated clothing before leaving the work area.

(3) Clothing or other material having contamination in excess of the amounts permitted by these Regulations shall not be removed from the work area.

30. (1) Every person using a radio-active substance not enclosed in a sealed source shall have on him or immediately available an instrument or instruments suitable for detecting and measuring contamination in accordance with the requirements of these Regulations.

(2) The licensee shall cause such instruments to be maintained in proper calibration.

31. In any installation in which radio-active substances not enclosed in sealed sources are used the licensee shall display in a prominent place a list of instructions approved by the Commission which are to be followed in the event of accidental contamination.

32. Whenever the licensee learns of any accidental release of a radio-active substance either within or beyond the installation he shall report the circumstances to the Commission.

33. The licensee shall—

(*a*) affix to all storage containers of radio-active substances and to all irradiating apparatus prescribed labels: Provided that the Commission may grant exemption where in its opinion the posting of such labels would constitute a source of disturbance to patients undergoing radiation diagnosis or treatment;

(*b*) display a prescribed notice within 12 feet of the point of storage or use at all storage areas for radio-active substances, and work areas where an irradiating apparatus or radio-active substance is in use.

34. (1) The prescribed label or notice for designating any radiation hazard from irradiating apparatus shall be in the form and colour set out in Part I. of the Fifth Schedule.

(2) In the case of radio-active substances the prescribed label or notice shall be in the form and colour set out in Part II. of the Fifth Schedule.

3. (*a*) Every such label and the lettering thereon shall be as large as practicable consistent with the circumstances of use.

(*b*) Every such notice shall be at least 2 feet square and the lettering thereon shall be as large as practicable.

(4) A prescribed label or notice shall not be displayed when a radiation hazard has been removed or is no longer present.

(5) The use of prescribed labels or notices except for the purposes prescribed is prohibited.

PART X.—TRANSPORT OF RADIO-ACTIVE SUBSTANCES.

35. No person shall offer or cause to be offered any radio-active substance for transport by aircraft, ship, rail, motor vehicle or other means of transport unless the radio-active substance is packed, shielded, labelled and marked in accordance with the provisions of these Regulations.

36. For the purposes of this Part radio-active substances shall be divided into three groups as follows:—

(i) Radio-active substances which emit gamma radiation either alone or with electrically charged particles or corpuscles, but which do not emit neutrons (hereinafter referred to as Group I. substances).

(ii) Radio-active substances which emit neutrons and either or both of the types of radiation characteristic of Group I. substances (hereinafter referred to as Group II. substances).

(iii) Radio-active substances which emit only electrically charged particles or corpuscles (hereinafter referred to as Group III. substances).

37. (1) The design and preparation of any package for a radio-active substance shall be such that there is no radio-active contamination on the outer surface thereof.

(2) The smallest dimension of any outer transport container for radio-active substances shall not be less than 4 inches and all outer transport containers of radio-active substances shall be of such design that gamma radiation will not exceed 200 millirontgens per hour or its equivalent at any point of readily accessible surface.

(3) The outer transport container for any radio-active substance shall be constructed of wood, fibre board, or metal or such other material as may be approved by the Commission.

38. No person shall offer for transport by post, aircraft, ship, rail or motor vehicle or other means of transport, any container or accessory which has been used for the shipment of any radio-active substance unless the container or the accessory is free from radio-active contamination on its outer surface.

39. (1) Group I. substances shall be so packed and shielded that at any time during the period of the journey the gamma radiation at a distance of 1 metre from any point on the container enclosing the radio-active source will not exceed 10 millirontgens per hour.

(2) Any shielding device used in conjunction with such container shall be designed so that it will maintain its efficiency under conditions normally incident to transport.

(3) The shielding device shall be sufficient to prevent the escape of any primary corpuscular radiation to the exterior of the outer transport container.

40. (1) Group II. substances shall be so packed and shielded that at any time during the journey the radiation measured at a distance of 1 metre from any point on the outer container enclosing the radio-active source will not exceed 10 millirems per hour.

(2) The shielding device for Group II. substances shall be designed so as to maintain its efficiency under conditions normally incident to transport.

41. (1) Group III. substances shall be packed in separate inner containers completely enclosed in such material as will prevent the escape of primary corpuscular radiation to the exterior of the transport container and the secondary radiation at the surface of the exterior container shall not exceed 10 millirems per 24 hours at any time during the period of the journey.

(2) Such inner container shall be constructed so as to maintain its efficiency under conditions normally incident to transport.

42. (1) Radio-active substances which are in liquid form shall in addition to any requirement of the four immediately preceding Regulations which may be applicable be packed inside an inner container which is sealed.

(2) The inner container shall be surrounded on all sides and within the shield by an absorbent material sufficient to absorb the entire liquid content and of such a nature that its effectiveness will not be impaired by chemical reaction with the liquid.

43. No person shall offer or cause to be offered for transport any radio-active substance in one container in excess of two curies: Provided that the Commission may in any particular case authorize the transport of quantities in excess of this amount under such conditions as it shall in writing specify.

44. During transportation of any package containing a radio-active substance the person licensed to transport the radio-active substance shall place or cause to be placed the package at such a distance from the driver's seat or from any seat occupied by a passenger that the radiation dose received by any person shall not be in excess of 5 millirontgens of gamma radiation per hour.

45. (1) The licensee consigning any package containing a radio-active substance shall arrange for its safe transport in accordance with these Regulations and ensure that any vehicle used for its transport shall carry in the driver's cabin a conspicuous warning notice permanently engraved on metal as follows:—

"*Warning.*—This vehicle is carrying radio-active substance(s) in labelled container(s). In case of accident to this vehicle communicate at once with the Consignor or the Commission of Public Health, 295 Queen-street, Melbourne, telephone MU 6384."

(Consignor's name, address and telephone number to be stated.)

(2) The licensee responsible for the consignment of and the driver of any vehicle carrying any radio-active substance shall cause the notice as aforesaid to be displayed in a conspicuous position in the driver's cabin during the whole of the time the substance is being transported.

46. The licensee consigning the substance on becoming aware of any accident to a vehicle carrying a radio-active substance shall notify the Commission as soon as practicable of the occurrence.

47. (1) Each outer transport container of a Group I. or Group II. substance shall be labelled by the licensee responsible for the consignment with a properly executed label as set out in Form A of the Fourth Schedule.

(2) Each outer transport container of a Group III. substance shall be labelled by the licensee responsible for the consignment with a proper label as set out in Form B of the Fourth Schedule.

(3) Each outer transport container of a radio-active substance shall in addition bear a certificate in Form C of the Fourth Schedule.

48. (1) No person shall place a container carrying a red label as described in Form A of the Fourth Schedule, or permit the same to be placed or to remain in any vehicle, ship, aircraft, depot, room or other place closer than 3 feet from an area which may be occupied by passengers, employees or animals.

(2) When more than one such container is present the distance from occupied areas shall be computed from the table set out in the Sixth Schedule by adding the number of units shown on the labels on the containers.

(3) The number of containers of Group I. and/or Group II. substances transported at any one time in any vehicle or aircraft or stored at any one time in any depot, room or other place in the course of transit shall be limited by the person for the time being responsible for custody while in transport so that the total gamma radiation from them shall not exceed 40 units.

(4) For the purpose of sub-regulation (3) of this Regulation one unit of gamma radiation means 1 millirontgen per hour at a distance of 1 metre from the container in question.

(5) The person responsible for the time being for the custody while in transit of any container of radio-active substance shall block and brace the same so as to prevent any accidental shift of lading under conditions normally incident to transport.

49. (1) Where any accident to a vehicle, ship or aircraft results in breakage of or suspected breakage of or unusual delay in delivery of a radio-active substance the person responsible for the time being for the custody thereof while in transit shall segregate the package or substance as far as possible from human contacts and shall immediately notify the licensee responsible for consigning the package and the Commission.

(2) When a package containing a radio-active substance has been broken the person responsible for the time being for the custody thereof shall exercise all possible care to prevent contact with or inhalation of the radio-active substance by any person and shall segregate the package or substance as far as possible from human contacts and shall immediately notify the licensee responsible for consigning the package and the Commission.

50. The foregoing provisions of this Part and the provisions of Part VIII. of these Regulations shall not apply with respect to the transport of any radio-active substance if—

(*a*) the package contains not more than ·1 millicurie of radium or polonium or not more than ·135 millicurie of "strontium 89" or "barium 140" or not more than 1·35 millicurie of any other radio-active substance; and

(*b*) the package is such that no alpha, beta or neutron radiation is emitted from the exterior of the packages and that the gamma radiation at any surface on the package is less than 10 millirontgens per 24 hours.

51. Notwithstanding anything in this Part—

(*a*) Uranium ores, concentrates and similar radio-active substances may be transported loose in railway or road trucks provided that the gamma radiation at a distance of 1 metre from any point of the surface of the truck or load shall not exceed 10 millirontgens per hour and that the radiation dose received by the driver or any passenger in the train or truck shall not be in excess of 5 millirontgens of gamma radiation per hour.

(*b*) All trucks used for the transport of ore concentrates or similar radio-active substances shall be cleaned by a wet process or other method of dust control approved by the Commission.

(*c*) Foodstuffs for human consumption and loose foodstuffs for non-human consumption shall not be carried in trucks which may be used for the transport of uranium ore concentrates or for similar radio-active substances.

(*d*) Refined uranium compound shall be conveyed only in sealed metal drums and shall be packed, labelled and transported in accordance with the requirements of these Regulations.

52. Notwithstanding anything in these Regulations where any container of a radio-active substance arrives in Victoria from the United Kingdom, Canada, the United States of America or New Zealand it shall be deemed to comply with the provisions of these Regulations relating to the packing, marking and labelling of radio-active substances if it is packed, labelled and marked in accordance with the law in that behalf in force for the time being in the country from which it was despatched.

53. (1) The Commission may by writing exempt any person from compliance with any specified provisions of these Regulations in relation to a particular consignment or may modify the requirements of any such specified provision if it is satisfied that adequate freedom from radiation hazard can and will be otherwise secured.

(2) The Commission may by writing revoke at any time any exemption or modification granted in accordance with sub-regulation (1) of this Regulation.

54. (1) The provisions of these Regulations relating to the carriage of radio-active substances shall be deemed to have been complied with—

(*a*) in the case of the carriage of radio-active substances by aircraft, if the provisions of the *Air Navigation Act* 1920-1947 of the Commonwealth and of any Act amending that Act or in substitution therefor and of the regulations and orders made thereunder relating to the carriage of dangerous goods are complied with; and

(*b*) in the case of the carriage of radio-active substances by sea, if the provisions of the *Navigation Act* 1912-1956 of the Commonwealth and of any Act amending that Act or in substitution therefor and of the regulations, rules and orders made thereunder relating to the carriage of dangerous goods are complied with.

PART XI.—DISPOSAL OF RADIO-ACTIVE WASTES.

55. (1) Every person responsible for the disposal of radio-active wastes shall release these substances only in such a manner that the radio-active substance discharged will not cause such contamination of the environment as may result in any person receiving more than the maximum permissible dose of radiation prescribed in these Regulations.

(2) In the case of radio-active substances discharged into the air the concentration of the substance in air at the point of discharge shall not exceed the concentration shown in Part II. of the Third Schedule to these Regulations.

(3) In the case of liquid wastes the concentration of radio-active substance in water at the point of discharge shall not exceed the concentration shown in Part II. of the Third Schedule to these Regulations.

(4) Solid wastes shall be disposed of only in accordance with procedures and conditions approved by the Commission.

PART XII.—MEDICAL EXAMINATIONS.

56. (1) All employees exposed to or likely to be exposed to a radiation hazard shall prior to commencing employment, during employment at such intervals as the Commission directs, and on the termination of employment be medically examined, unless exempted from such examination by the Commission.

(2) The type and frequency of the examinations shall be at the discretion of the Commission and the results thereof shall be recorded in the continuing personal record as specified in these Regulations.

PART XIII.—PENALTY.

57. Any person who contravenes or fails to comply with any provision of these Regulations shall be liable to a penalty of not more than Twenty pounds and in the case of a continuing offence to a further daily penalty of not more than Five pounds, but so that the total amount of such penalty shall not exceed One hundred pounds.

FIRST SCHEDULE.

MAXIMUM AMOUNTS OF RADIO-ACTIVE SUBSTANCE EXEMPTED FROM THESE REGULATIONS.

(REGULATION 4.)

Any radio-active substance not listed in the table shall be considered as being in Group 2.

Group 1:—*Maximum allowed*: 1 *microcurie.*

Lead (210) Radium (226) Actinium (227) Plutonium (230) Americium (241) Polonium (219) Astatine (211) Uranium (233).

Group 2:—*Maximum allowed*: 10 *microcuries.*

Scandium (46) Cobalt (60) Strontium (90) Ruthenium (106) Silver (105) Tellurium (129) Iodine (131) Caesium (137) Cirium (144) Europium (154) Tungsten (181) Rhenium (183) Iridium (192).

Group 3:—*Maximum allowed*: 100 *microcuries.*

Phosphorus (32) Chlorine (36) Calcium (45) Scandium (48) Vanadium (48) Iron (59) Zinc (65) Gallium (72) Arsenic (76) Rubidium (86) Strontium (89) Yttrium (91) Niobium (95) Technetium (96) Rhodium (105) Silver (111) Cadmium (109) Tin (113) Tellurium (127) Barium (140) Lanthanum (140) Praesodymium (143) Samarium (151) Holmium (166) Thulium (170) Lutecium (177) Tantalum (182) Platinum (191) Gold (198) Thallium (200) Thallium (204) Lead (203) Thorium (234).

Group 4:—*Maximum allowed*: 1,000 *microcuries*.

Hydrogen (3) Berryllium (7) Carbon (14) Sodium (24) Sulphur (35) Potassium (42) Chromium (51) Manganese (56) Iron (55) Nickel (59) Copper (64) Germanium (71) Molybdenum (99) Palladium (103) Promethium (147) Iridium (190) Gold (196) Thallium (201) Thallium (202).

Figures immediately following a substance in the above table refer to the atomic mass numbers of the substance, thus, for example Hydrogen (3) means Hydrogen of Atomic Mass three.

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM I.).

APPLICATION FOR LICENCE FOR IRRADIATING APPARATUS.

REGULATION 7.

Particulars Required.

1. Name of Applicant.....
2. Address.....
3. Business or occupation (including profession).....
4. Telephone number.....
5. Name and type of irradiating apparatus.....
.....
6. Maximum operating factors, kilovoltage.....
milliampere rating..... other factors.....
7. Location where apparatus is installed.....
.....
8. Name and occupation of person responsible for operating apparatus
.....
9. Names, occupations, qualifications and experience of all personnel who will use the apparatus for radiation work:—

Name.	Occupation.	Qualification for and experience on type of work.

10. Names and occupations of persons employed who might be exposed to radiation:—

Name.	Occupation.

Date.....

.....
(Signature of Applicant.)

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM IA).

LICENCE TO POSSESS AND USE AN IRRADIATING APPARATUS.

The Licensee named hereunder is authorized subject to the conditions specified to have in his possession and to use the Irradiating Apparatus set out subject to the above-mentioned Regulations for a period of twelve months from the date hereon.

Name of Licensee.	Type of Irradiating Apparatus.	Conditions as to Use.

Date.....

.....
Secretary,
Commission of Public Health.

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM II).

APPLICATION FOR LICENCE FOR RADIO-ACTIVE SUBSTANCE(S) (SEALED SOURCE).

REGULATION 6.

Particulars Required.

1. Name of Applicant.....
2. Address.....
3. Business or occupation (including profession).....
4. Telephone number.....
5. Name and type of sealed source for which licence is sought:—

Name of Substance.	Type.	Activity of Substance at Specified Time.

(If space inadequate please include list).

6. Location where the substance(s) is / are to be used.....
.....
7. The purpose for which substance(s) is / are to be used.....
.....
8. Details of storage handling and any other special facilities.....
.....
.....
9. Location of storage room.....
10. Names, occupations, qualifications and experience of all personnel who will use substance:—

Names.	Occupations.	Qualifications and Experience.

(If space inadequate please include list.)

11. Names and occupations of persons employed who might be exposed to radiation:—

Name.	Designation.

(If space inadequate please include list.)

Date.....

.....
(Signature of Applicant.)

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM IIA).

RADIO-ACTIVE SUBSTANCE IN *A SEALED SOURCE—LICENCE.
UNSEALED SOURCE

The Licensee named hereunder is authorized subject to the conditions specified to have in his possession, use, sell, transport or otherwise dispose of radio-active substance(s) set out in quantities no greater than listed subject to the above Regulations for a period of twelve months from the date hereon.

Name of Licensee.	Type of Substance	Activity of Substance at Specified Time.	Nature of Source.

Conditions of issue of Licence.....

.....

Date..... .....

Secretary,
Commission of Public Health.

.....

.....

.....

*Strike out words not applicable.

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM III.).

APPLICATION FOR LICENCE FOR.....RADIO-ACTIVE SUBSTANCE(S) IN UNSEALED SOURCE(S).

REGULATION 7.

Particulars Required.

1. Name of Applicant.....
2. Address.....
3. Business or occupation (including profession).....
4. Telephone Number.....
5. Name and type of unsealed source for which licence is sought:—

Name of Substance.	Type.	Activity of Substance at Time Specified.

6. Location where the substance(s) is/are to be used.....

.....

7. The purpose for which substance(s) is/are to be used.....

.....

8. Details of storage handling and any other special facilities.....

.....

9. Location of storage room.....
10. Nature and quantity of any radio-active waste to be produced.....

.....

11. Proposed method of disposal of radio-active waste.....

.....

12. Names, occupations, qualifications and experience of all personnel who will use substance:—

Name.	Occupation.	Qualifications and Experience.

13. Details of the type of radiation measuring instrument to be used by the applicant.....

.....

Date..... .....

(Signature of Applicant)

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM IV.).

APPLICATION FOR LICENCE FOR TRANSPORTING RADIO-ACTIVE SUBSTANCES.

REGULATION 7.

1. Name of Applicant.....
2. Address .....
3. Telephone Number.....
4. Name and address of employees likely to handle or come in contact with radiation from substances:—

Name.	Designation.

It is hereby acknowledged that the applicant and/or his employees who are likely to handle radio-active substances have read the above-mentioned Regulations and are fully aware of their requirements.

Date..... .....

(Signature of Applicant)

COMMISSION OF PUBLIC HEALTH.

IRRADIATING APPARATUS AND RADIO-ACTIVE SUBSTANCES REGULATIONS 1959.

SECOND SCHEDULE (FORM IVA.).

LICENCE TO TRANSPORT AND STORE RADIO-ACTIVE SUBSTANCE IN THE COURSE OF TRANSPORT.

* .....is authorized subject to the conditions specified to transport and to store in the course of transport radio-active substances subject to the above Regulations for a period of twelve months from the date hereon.

Conditions specified .....

.....

.....

.....

Date.....

Secretary,
Commission of Public Health.

.....

.....

.....

* Here insert name of licensee.

THIRD SCHEDULE.

PART I.—RELATIVE BIOLOGICAL EFFECTIVENESS.

The relative biological effectiveness (R.B.E.) applicable to exposure to radiation from external sources is given in the following table:—

R.B.E. VALUES.

Radiation.	Relative Biological Effectiveness.
X-rays, gamma rays, electrons and beta rays of all energies	1·0
Fast neutrons and protons up to 10 Mev. ..	10
Naturally occurring alpha particles	Compare with 0.1 microcurie Ra, otherwise = 10
Heavy recoil nuclei	20

The R.B.E. is evaluated numerically as the inverse ratio of the doses of two different radiations necessary to produce the same biological effect.

THIRD SCHEDULE.

PART II.

Radio-isotope.	Column I (a) Microcuries per Millilitre of air.	Column II Microcuries per Millilitre of water.
A^{41}	5×10^{-7}	5×10^{-4}
Ag^{105}	1×10^{-5}	2
Ag^{111}	3×10^{-5}	4
Ag^{241}	3×10^{-11}	1×10^{-4}
As^{76}	2×10^{-6}	0·2
At^{211}	3×10^{-10}	2×10^{-6}
Au^{198}	1×10^{-7}	3×10^{-3}
Au^{199}	$2{\cdot}5 \times 10^{-7}$	7×10^{-3}
$Ba^{140} + La^{140}$	6×10^{-8}	2×10^{-3}
Ba^{7}	4×10^{-6}	1
C^{14}	5×10^{-7}	3×10^{-3}
Ca^{45}	3×10^{-6}	5×10^{-4}
$Cd^{109} + Ag^{109m}$	7×10^{-8}	7×10^{-2}
$Ce^{144} + Pr^{144}$	7×10^{-9}	4×10^{-2}
Cl^{36}	4×10^{-7}	9×10^{-4}
Cm^{242}	2×10^{-10}	9×10^{-4}
Co^{60}	1×10^{-6}	2×10^{-2}
Cr^{51}	8×10^{-6}	0·5
$Cs^{137} + Ba^{137m}$	2×10^{-7}	$1{\cdot}5 \times 10^{-3}$
Cu^{64}	6×10^{-6}	8×10^{-2}
Eu^{154}	6×10^{-9}	3×10^{-2}
F^{18}	1×10^{-6}	0·9
Fe^{55}	6×10^{-7}	4×10^{-3}
Fe^{59}	$1{\cdot}5 \times 10^{-8}$	1×10^{-4}
Ga^{72}	3×10^{-6}	9
Ge^{71}	4×10^{-5}	9
H^{3} (HTO or T_2O)	2×10^{-5}	0·2
Ho^{166}	3×10^{-6}	23
I^{131}	5×10^{-9}	3×10^{-5}
Ir^{190}	7×10^{-7}	1×10^{-2}
Ir^{192}	5×10^{-8}	9×10^{-4}
K^{42}	2×10^{-6}	1×10^{-2}
La^{140}	1×10^{-6}	1
Lu^{177}	5×10^{-6}	24
Mn^{56}	3×10^{-6}	0·15
Mo^{99}	2×10^{-3}	14
Na^{24}	2×10^{-8}	8×10^{-3}
Nb^{95}	4×10^{-7}	4×10^{-2}
Ni^{59}	2×10^{-5}	0·25
P^{32}	1×10^{-7}	2×10^{-4}
Pb^{203}	$6{\cdot}5 \times 10^{-6}$	0·1
$Od^{103} + Rh^{103}$	7×10^{-7}	1×10^{-2}
Pm^{147}	2×10^{-7}	1
Po^{210} (sol.)	2×10^{-10}	3×10^{-5}
Po^{210} (insol.)	7×10^{-11}	..
Pr^{143}	$7{\cdot}5 \times 10^{-7}$	0·4
Pu^{239} (sol.)	2×10^{-12}	$1{\cdot}5 \times 10^{-6}$
Pu^{239} (insol.)	2×10^{-12}	..
$Ra^{226} + \frac{1}{2}$ dr^{b}	8×10^{-13}	4×10^{-8}
Rb^{86}	4×10^{-7}	3×10^{-3}
Re^{183}	8×10^{-6}	8×10^{-2}
Rh^{105}	1×10^{-6}	$1{\cdot}5 \times 10^{-2}$
$Rn^{222} + dr^{b}$	1×10^{-7}	2×10^{-6}
$Ru^{106} + Rh^{106}$	3×10^{-8}	0·1
S^{35}	1×10^{-6}	5×10^{-3}
Sc^{46}	7×10^{-8}	0·4
Sm^{151}	1×10^{-6}	0·2
Sn^{113}	6×10^{-7}	0·2
Sr^{89}	2×10^{-8}	7×10^{-5}
$Sr^{90} + Y^{90}$	2×10^{-10}	8×10^{-7}
To^{98}	3×10^{-6}	3×10^{-2}
Te^{127}	1×10^{-7}	3×10^{-3}
Te^{129}	4×10^{-8}	1×10^{-2}
Th^{234}	6×10^{-7}	3
Th-natural (insol.)	3×10^{-11}	..
Th-natural	3×10^{-11}	4×10^{-7}
Tm^{170}	5×10^{-6}	0·25
U^{233} (sol.)	1×10^{-10}	$1{\cdot}5 \times 10^{-4}$
U^{233} (insol.)	$1{\cdot}6 \times 10^{-11}$	..
U-natural (sol.)	$1{\cdot}7 \times 10^{-11}$	7×10^{-5}
U-natural (insol.)	$1{\cdot}7 \times 10^{-11}$	..
V^{48}	1×10^{-6}	0·5
Xe^{133}	4×10^{-6}	4×10^{-3}
Xe^{135}	2×10^{-6}	1×10^{-3}
Y^{91}	4×10^{-8}	0·2
Zn^{65}	2×10^{-6}	6×10^{-2}
All other beta or gamma emitters	1×10^{-9}	1×10^{-7}
All other alpha emitters	5×10^{-12}	1×10^{-7}

(a) The values given in Columns I. and II. apply to continuous exposures for 24 hours a day; but where it can be shown that exposure is incurred only during a work day of eight hours the values in Column I. may be multiplied by a factor of three.

(b) dr. means daughter products.

FOURTH SCHEDULE.

Form A.

(I.) The color specification for the dark portions of the label including the lettering thereon shall be red; and

(II.) The color specification for the remainder of the label shall be white.

Form B.

(I.) The color specification for the dark portions of the label including the lettering and figures thereon shall be blue.

(II.) The color specification for the remainder of the label shall be white.

FORM C.—CERTIFICATE.

This is to certify that the contents of this package are properly described by name, are packed and marked in accordance with the provisions of the "Irradiating Apparatus and Radio-active Substances Regulations 1959," and are in a proper condition for transport.

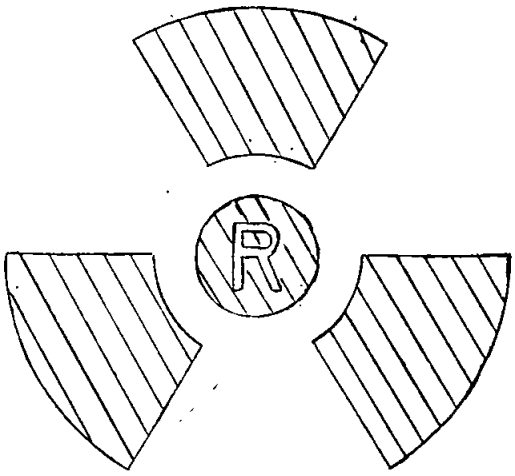
.....
Consignor's Signature.

.....
Consignor's Address.

.....
Consignor's Telephone Number.

FIFTH SCHEDULE—PART I.

"DANGER RADIATION"
THIS APPARATUS PRODUCES RADIATION WHEN ENERGISED.



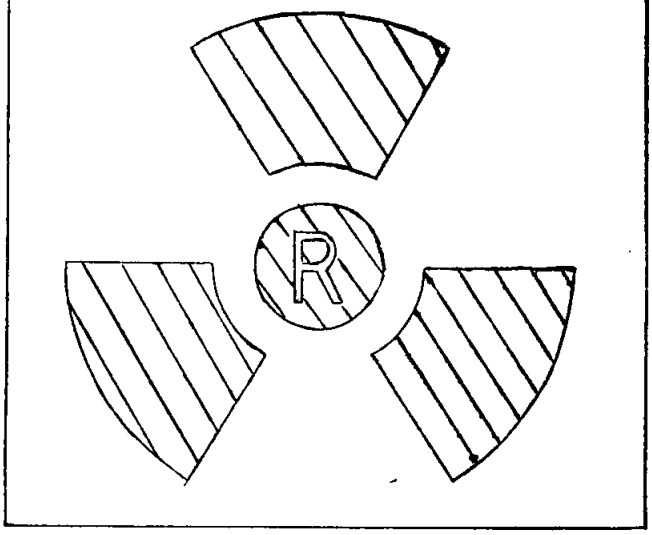
(I.) The standard color specification for the hachured portions of the symbol shall be magenta.

(II.) The color specification for the background of the label shall be yellow and the letter "R" in the centre of the symbol shall be in yellow.

(III.) The words "Danger Radiation". "This apparatus produces radiation when energised" shall be printed in red on a white background.

FIFTH SCHEDULE—PART 2.

"DANGER—RADIO-ACTIVE"



(I.) The standard color specification for the hachured portions of the symbol shall be magenta.

(II.) The color specification for the background of the label within the border enclosing the symbol shall be yellow, and the letter "R" in the centre of the symbol shall be in yellow.

(III.) The words "Danger Radio-active" shall be in red and the background area within the border enclosing the words shall be in white.

SIXTH SCHEDULE.

TABLE FOR COMPUTING DISTANCES TO BE ALLOWED BETWEEN PACKAGES OF RADIO-ACTIVE SUBSTANCES AND OCCUPIED AREAS.

Total Number of Units.	Distance in Feet to Area that may be continuously occupied by passengers or employees for periods.	
	Up to Eight Hours.	Exceeding Eight Hours, but not Exceeding Twenty-four Hours.
1 to 10	3	5
11 to 20	4	7
21 to 30	5	9
31 to 40	6	10

The distance in the Table shall be measured from the nearest point of the container or containers.

And the Honorable Ewen Paul Cameron, Her Majesty's Minister of Health for the State of Victoria, shall give the necessary directions herein accordingly.

A. MAHLSTEDT,
Clerk of the Executive Council.

By Authority: A. C. BROOKS, Government Printer, Melbourne.