Western Australia

Radiation Safety Act 1975

Radiation Safety (General) Regulations 1983

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Western Australia

Radiation Safety (General) Regulations 1983

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Defined terms

Radiation Safety (General) Regulations 1983

Part I — Preliminary

1. Citation

These regulations may be cited as the *Radiation Safety (General) Regulations 1983*.

2. Commencement

These regulations shall come into operation on the expiry of the period of 6 months commencing on the day on which these regulations are published in the *Gazette*.

3. Terms used

(1) In these regulations, unless the contrary intention appears —

absorbed dose means quotient of dĒ by dm, where dĒ is the mean energy imparted by ionising radiation to matter of mass dm;

approved means approved in writing by the Council;

becquerel means SI unit of activity corresponding to one nuclear transition per second;

chest screening means plain radiography of the chest authorised under a written law for occupational or public health reasons;

chiropractor means a person who is registered under the *Health Practitioner Regulation National Law (Western Australia)* in the chiropractic profession;

class 1 laser means a class 1 laser product as defined by section 3.17 of the laser safety standard;

class 2 laser means a class 2 laser product as defined by section 3.19 of the laser safety standard;

class 3B laser means a class 3B laser product as defined by section 3.21 of the laser safety standard;

class 3R laser means a class 3R laser product as defined by section 3.21 of the laser safety standard;

class 4 laser means a class 4 laser product as defined by section 3.22 of the laser safety standard;

condition includes restriction and limitation;

cooling curve means graphical relationship between energy stored as heat and cooling time;

dentist means a person registered under the *Health Practitioner Regulation National Law (Western Australia)* in the dental profession whose name is entered on the Dentists Division of the Register of Dental Practitioners kept under that Law;

designated radiation worker means radiation worker designated by a registrant, a radiation safety officer or the Council as having an occupational radiation exposure with the potential to exceed the effective or equivalent dose limits;

disposal permit means disposal permit granted under section 34;

effective dose means sum of the weighted equivalent doses in all organs and tissues of the body calculated using the formula —

$$\mathrm{E} = \sum_{\mathrm{T}} \mathrm{w_T}\ \mathrm{H_T}$$

where —

E is the effective dose;

W_T is the tissue weighting factor for the organ or tissue T;

H_T is the equivalent dose in the organ or tissue T;

effective dose limit means dose limit specified in item 1(1), (3) or (4) of Schedule I;

equivalent dose means the sum of the weighted absorbed doses in an organ or tissue calculated using the formula —

$$H_T = \sum_R w_R \, D_{T.R}$$

where —

H_T is the equivalent dose in the organ or tissue T;

W_R is the radiation weighting factor for the radiation R;

$D_{T.R}$ is the absorbed dose from the radiation R averaged over the organ or tissue T;

equivalent dose limit means dose limit specified in item 1(2)(a) of Schedule I;

exemption means exemption referred to in section 6 and cognate expressions shall be construed accordingly;

field site means any place —

(a) which is not a premises; and

(b) which is used by the registrant of a premises in connection with the premises; and

(c) at which radiation workers operate or use irradiating apparatus or radioactive substances that have been taken temporarily to that site;

filtration means modification of the characteristics of ionising radiation in passing through matter;

fluoroscopy means the use of a continuous or pulsed x-ray beam to produce a dynamic real time image, the duration of which is not predetermined before the exposure is initiated;

form means form specified in Schedule II;

general supervision means the exercise of control over radiation safety without the person exercising such control necessarily being present at the registered premises or field site;

gray means SI unit of absorbed dose in matter corresponding to the absorption of one joule per kilogram of matter;

half value layer means thickness of a specified material that attenuates a beam of radiation so that the absorbed dose rate in air or exposure rate at a given point is reduced by half;

image receptor means x-ray film, fluorescent screen, image intensifier input phosphor or electronic device in or from which an image is created following exposure to x-rays;

industrial radiographer means a licensee who holds a licence which specifies that the purpose of the licence is industrial radiography;

ionisation means process by which one or more electrons are liberated from a parent atom or molecule or other bound state;

ionising radiation means radiation capable of causing ionisation by primary and secondary processes;

item means item of the Schedule in which the term appears;

keep includes cause to be kept;

laser means electronic product which can be made to produce or amplify electromagnetic radiation primarily by the process of controlled stimulated emission;

laser safety standard means the publication entitled "Safety of laser products", being AS/NZS 2211.1:2004, published by Standards Australia in March 2004;

leakage radiation means ionising radiation emerging after transmission through the protective shielding of the source of the ionising radiation;

licence means licence granted under the Act;

licence card means a card issued in the form set out in Form RS16 of Schedule II;

licensed, in relation to a person, means that the person is the holder of a relevant licence under the Act;

licensee means holder of a licence;

low powered irradiating apparatus means irradiating apparatus registered for the purpose of medical radiography (other than mammography or dental radiography) that has a maximum

rating of 100 kV(peak) at 100 mA or 100 kV(peak) and 1 microfarad;

lux means SI unit of illuminance corresponding to one lumen per square metre;

mammography screening means mammography conducted without a referral from a medical practitioner;

maximum permissible exposure level means maximum permissible exposure level specified in item 2 of Schedule I;

medical practitioner means a person who is registered under the *Health Practitioner Regulation National Law (Western Australia)* in the medical profession;

microwave oven means electronic product which is a microwave cooking appliance designed to heat food by the use of microwave energy in the frequency range between 300 MHz and 30 000 MHz;

microwave oven standard means the publication entitled "Approval and Test Specification - Particular Requirements for Microwave Ovens", being AS 3301 - 1992, published by the Standards Association of Australia [2];

NHMRC means the National Health and Medical Research Council established under the *National Health and Medical Research Council Act 1992* (Commonwealth) section 5B;

non-ionising radiation means radiation other than ionising radiation;

nuclide means species of atom having specified numbers of neutrons and protons in its nucleus;

permit means disposal permit or temporary permit;

personal file means personal file kept under regulation 11;

personal monitoring device means device designed to detect and measure the radiation dose received by a person;

personal supervision means the exercise of control over radiation safety by the person exercising such control being present on the registered premises or field site;

physiotherapist means a person who is registered under the *Health Practitioner Regulation National Law (Western Australia)* in the physiotherapy profession;

plain radiography means an x-ray examination during the course of which —

(a) the x-ray tube and film remain stationary; and

(b) no contrast medium is introduced into the patient;

podiatrist means a person who is registered under the *Health Practitioner Regulation National Law (Western Australia)* in the podiatry profession;

premises means premises referred to in section 28(1)(a);

publication means standard, rule, code or specification referred to in section 58(2)(e);

qualified expert means expert whose qualifications are approved;

quality factor, in relation to radiation, means factor which is a function of the linear collision stopping power in water of the radiation at the point of interest;

radiation means energy propagated through space or through a material medium in the form of waves or of kinetic energy of particles;

radiation oncologist means a medical practitioner with qualifications in radiation oncology that are recognized by the Royal Australasian College of Radiologists;

radiation safety committee means radiation safety committee appointed under regulation 18;

radiation safety officer means radiation safety officer appointed under regulation 18;

radiation therapist means a person with qualifications in the application of radiation for therapeutic purposes who is eligible for ordinary membership of the Australian Institute of Radiography;

radiation warning symbol means radiation warning symbol described and depicted in Schedule IV;

radiation weighting factor means factor set out in Table 1 of the publication entitled "Recommendations for limiting exposure to ionizing radiation (1995)", approved by the NHMRC in June 1995, which modifies the absorbed dose in an organ or tissue to yield the equivalent dose in that organ or tissue;

radiation worker means person who in the course of his employment may be exposed to radiation arising from his direct involvement with sources of radiation;

radioactive material means material which spontaneously emits ionising radiation;

radiographer means a person with qualifications in diagnostic radiography who is eligible for ordinary membership of the Australian Institute of Radiography;

radiologist means a medical practitioner with qualifications in diagnostic radiology that are recognized by the Royal Australasian College of Radiologists;

registered means registered under the Act and cognate expressions shall be construed accordingly;

registrant means person in whose name premises are registered;

sealed source means radioactive material sealed in a container, or having a bonded cover, strong enough to prevent contact with and dispersal of the radioactive material under the conditions of use and wear for which that container or cover was designed;

section means section of the Act;

sievert means SI unit of effective dose or equivalent dose;

sun-tanning unit means an electronic product that —

(a) is capable of producing ultraviolet radiation between 100 nm and 400 nm wavelength; and

(b) is designed to produce tanning of human skin; and

(c) is provided for tanning the skin of a person —

(i) for a fee or reward; or

(ii) as part of providing a service for a fee or reward;

temporary permit means temporary permit granted under section 35;

tissue weighting factor means factor set out in Table 2 of the publication entitled "Recommendations for limiting exposure to ionizing radiation (1995)", approved by the NHMRC in June 1995, by which the equivalent dose in an organ or tissue is modified to yield a component of effective dose;

transilluminator means electronic product which is —

(a) capable of producing ultraviolet radiation between 240 nm and 400 nm wavelength from a mercury or other vapour lamp; and

(b) designed for use in laboratory or industrial applications for back illumination of transparent fluorescent materials;

veterinarian has the meaning given in the *Veterinary Practice Act 2021* section 3;

x-ray operator means a person who has attended an approved course of training and has passed an examination in radiation safety and radiographic techniques for plain radiography of the chest and extremities;

x-rays means electromagnetic radiation which is produced by —

(a) the transitions of electrons between the various electron shells of an atom; or

(b) the deceleration of electrons in the vicinity of nuclei.

(2) In these regulations, a reference to the name of a SI unit preceded by the prefix —

(a) "tera" is a reference to the SI unit multiplied by 10^{12}; and

(b) "giga" is a reference to the SI unit multiplied by 10^{9}; and

(c) "mega" is a reference to the SI unit multiplied by 10^6; and

(d) "kilo" is a reference to the SI unit multiplied by 10^3; and

(e) "milli" is a reference to the SI unit multiplied by 10^{-3}; and

(f) "micro" is a reference to the SI unit multiplied by 10^{-6}.

(3) Copies of publications referred to in these regulations can be consulted free of charge at the library of the Radiation Health Section of the Environmental Health Service of the Health Department of Western Australia [3].

[Regulation 3 amended: Gazette 29 Jun 1984 p. 1784; 10 Oct 1986 p. 3844; 5 Dec 1986 p. 4468; 6 Sep 1991 p. 4631; 29 Nov 1991 p. 5989; 4 May 1993 p. 2300-01 and 2299-2300; 11 Jun 1993 p. 2870-1; 15 Oct 1996 p. 5448-9; 22 Jul 1997 p. 3813-15; 19 Aug 1997 p. 4721; 11 Nov 1997 p. 6209-10; 31 Dec 1999 p. 7060; 2 Sep 2008 p. 4117-18; 17 Aug 2010 p. 4045-6; 1 Apr 2011 p. 1183-4; 9 Oct 2015 p. 3982; 20 Sep 2016 p. 3967; SL 2022/93 r. 7.]

4. Application of regulations

(1) In this regulation —

other radiation regulations means —

(a) the *Radiation Safety (Transport of Radioactive Substances) Regulations 2002*; or

(b) the *Work Health and Safety (Mines) Regulations 2022* Part 10.2 Division 3 Subdivision 3B; or

(c) any regulations relating to the mining or milling of radioactive ores made under the *Nuclear Activities Regulation Act 1978*.

(2) If these regulations are inconsistent with any of the other radiation regulations, the other radiation regulations prevail.

[Regulation 4 inserted: SL 2022/33 r. 4.]

5. Radioactive substances for purposes of Act

(1) Subject to this regulation —

(a) a natural radioactive substance of an equivalent specific radioactivity not exceeding 0.03 megabecquerel per kilogram; or

(b) a quantity of a radioactive substance specified in the second column of Schedule V which does not exceed the maximum quantity specified opposite to that radioactive substance in the third column of that Schedule; or

(c) a quantity of a radioactive substance not specified in the second column of Schedule V, which does not exceed 0.004 megabecquerel; or

(d) a personal timekeeping or other approved device containing radioactive self luminous elements, which device —

(i) is used or possessed by an individual; and

(ii) does not contain as part of those self luminous elements a radioactive substance specified in the first column of Schedule VI in respect of the category of device concerned in a quantity exceeding the maximum quantity specified opposite to that radioactive substance in the second column of that Schedule;

or

(e) a self luminous device the purpose of which is related to safety and which contains less than 18.5 gigabecquerel of Hydrogen-3 and complies with the requirements set out in the publication entitled "Recommendations for Exemptions from Licensing of Gaseous Tritium Light Devices" approved by the NHMRC at its 81st Session in October 1975,

is a substance consisting of or containing, as the case requires, less than the maximum prescribed concentration of any

radioactive element, whether natural or artificial, for the purposes of the definition of ***radioactive substance*** in section 4.

(2) For the purposes of subregulation (1)(b), if a radioactive substance on any premises consists of or contains 2 or more radioactive chemical elements or radioactive isotopes of a chemical element and one or more of those elements or isotopes, as the case requires, is or are present in a quantity or quantities less than the maximum quantity or quantities specified in the third column of Schedule V opposite to the appropriate radioactive substance or radioactive substances specified in the second column of that Schedule, and the sum of the fractions obtained by dividing the number of megabecquerels of each such element or isotope present by the appropriate maximum quantity so specified does not exceed unity, that radioactive substance is a substance consisting of or containing, as the case requires, more than the maximum prescribed concentration referred to in subregulation (1).

(3) For the purposes of subregulation (1)(d), if a watch, clock or other timepiece contains 2 or more radioactive substances specified in the first column of Schedule VI and the sum of the fractions obtained by dividing the number of megabecquerels of each of those radioactive substances present by the maximum quantity specified opposite thereto in the second column of that Schedule exceeds unity, the watch, clock or other timepiece contains more than the maximum prescribed concentration referred to in subregulation (1).

(4) Notwithstanding anything in subregulations (1), (2) and (3), but subject to subregulation (6) —

(a) a radioactive substance referred to in subregulation (1) which the Council is of the opinion is used or likely to be used in such a manner that an individual may receive an effective dose exceeding the appropriate effective dose limit; or

(b) a personal timekeeping or other device referred to in subregulation (1)(d) which does not comply with the requirements set out in Schedule VI; or

(c) a gaseous self-luminous device which is not a self-luminous device referred to in subregulation (1)(e),

consists of or contains, as the case requires, more than the maximum prescribed concentration referred to in subregulation (1).

(5) Notwithstanding anything in subregulations (1), (2) and (3), but subject to subregulation (6), if the Council is of the opinion that a radioactive ore which is a natural radioactive substance referred to in subregulation (1)(a) may —

(a) give rise to a radiation hazard; or

(b) result in an individual receiving an effective dose exceeding the effective dose limit,

when that radioactive substance is mined or milled, that radioactive substance consists of more than the maximum prescribed concentration referred to in subregulation (1) while it is being mined or milled.

(6) If the Council forms an opinion referred to in subregulation (4)(a) or (5) it shall forthwith notify each user of the radioactive substance concerned in writing that he is required to comply with these regulations in respect of that radioactive substance.

(7) In subregulation (6) —

user, in relation to a radioactive substance, includes manufacturer, storer, transporter, seller, possessor, miner, miller or other dealer of or with, as the case requires, the radioactive substance.

[Regulation 5 amended: Gazette 22 Jul 1997 p. 3826; 16 Jul 2002 p. 3400.]

6. Irradiating apparatus for purposes of Act

(1) Subject to this regulation, any irradiating apparatus consisting of —

(a) electrical equipment, including equipment incorporating cathode ray tubes, transmitting valves, rectifying valves and image converters, which equipment —

(i) is not intended to produce ionising radiation; and

(ii) does not produce an absorbed dose rate in air exceeding 5 micrograys per hour at a distance of 50 mm from any point on the surface of that equipment;

or

(b) a television receiver or video display unit which does not produce an absorbed dose rate in air exceeding 5 micrograys per hour averaged over an area of 100 sq mm at a distance of 50 mm from any point on the external surface of that receiver or unit,

is an apparatus which is not capable of producing ionising radiation of any prescribed type within the meaning of the definition of ***irradiating apparatus*** in section 4.

(2) For the purposes of subregulation (1)(b), any measurement of absorbed dose rates in air shall be made with power source voltages up to 110% of the nominal root mean square voltage specified by the manufacturer of the television receiver or video display unit concerned, with —

(a) a usable image displayed by that receiver or unit; and

(b) all the controls of that receiver or unit so adjusted that the maximum production of ionising radiation takes place; and

(c) conditions identical to those which result from that circuit or component failure which gives rise to the maximum production of ionising radiation.

(3) Notwithstanding anything in this regulation, any irradiating apparatus referred to in subregulation (1) —

(a) which is being production tested, production serviced or repaired; or

(b) which is handled or used in such a manner that an individual may receive therefrom an effective dose exceeding the appropriate effective dose limit,

is an irradiating apparatus which is capable of producing ionising radiation of a prescribed type within the meaning of the definition of ***irradiating apparatus*** in section 4.

(4) For the purposes of the definition of ***irradiating apparatus*** in section 4, x-rays are a prescribed type of radiation.

[Regulation 6 amended: Gazette 22 Jul 1997 p. 3826.]

7. Prescribed and exempted electronic products

(1) Subject to subregulation (2), microwave ovens, lasers, sun-tanning units and transilluminators are prescribed for the purposes of section 6(1)(c) as being subject to the provisions of the Act and these regulations.

(2) An exemption under section 6 is granted from all provisions of the Act and these regulations which apply to or in relation to the electronic products specified in Schedule VII other than —

(a) the regulations specified opposite the products in that Schedule; and

(b) those provisions of the Act necessary to support the making of those regulations.

[Regulation 7 amended: Gazette 10 Oct 1986 p. 3844; 4 May 1993 p. 2300; 19 Aug 1997 p. 4721; 31 Dec 1999 p. 7060; 2 Sep 2008 p. 4118; 9 Oct 2015 p. 3982.]

7A. Exemption for radioactive substances contained in certain self luminous devices

(1) Subject to subregulation (2), a radioactive substance that is contained in a self luminous device of a model and type specified in Schedule VIIA, or that is contained in a gaseous tritium light device used in an aircraft, is exempted from the provisions of the Act and the regulations, except those provisions relating to the sale or disposal of radioactive substances.

(2) Subject to subregulation (3), the exemption given by subregulation (1) does not apply in relation to a device unless —

(a) the device is used for a purpose which is related to safety; and

(b) the device does not incorporate any change in design or structure that has been made since the exemption was granted; and

(c) the device has affixed to its front surface, in a prominent position, a durable label in the form shown hereunder —

* CAUTION RADIOACTIVE *
Disposal of this device other than to the supplier or to the Radiation Health Section of the Health Department of WA [3] is an offence
Radiation Health Section, 18 Verdun St, Nedlands WA 6009

* small radiation warning symbol;

and

(d) the device has affixed to it a label indicating the radioisotope it contains, its activity as measured on a particular date and the date on which that activity was measured, and the effective useful life span of the device.

(3) Subregulation (2)(b) and (c) do not apply to a gaseous tritium light device used in an aircraft.

[Regulation 7A inserted: Gazette 6 Sep 1991 p. 4631; amended: Gazette 4 Mar 1994 p. 837.]

7B. Exemptions relating to Americium 241 contained in certain smoke detectors

(1) In this regulation —

smoke detector means a device incorporated into a smoke alarm or a smoke alarm system that responds to combustion products capable of affecting currents of ionisation within that device.

(2) Subject to this regulation the radioactive substance Americium 241, when contained in a smoke detector, is exempted from the provisions of the Act and these regulations.

(3) The exemption under subregulation (2) does not apply unless the smoke detector in which the Americium 241 is contained —

(a) contains no more than 40 kilobecquerels of that substance; and

(b) complies with the requirements of —

(i) the publication entitled "Smoke alarms", being AS 3786-1993 issued by the Standards Association of Australia [2]; or

(ii) the publication entitled "Automatic fire detection and alarm systems Part 2: Point type smoke detectors", being AS 1603.2-1990 issued by the Standards Association of Australia [2];

and

(c) is of a model or type that has been tested and approved by the Scientific Services Laboratory of the Australian Construction Services, Department of Administrative Services of the Commonwealth.

(4) Notwithstanding anything in this regulation, sections 25 and 28 apply to a person who is the owner of any premises, or of any part of any premises, where the total quantity of Americium 241 contained in smoke detectors stored or installed on or in those premises exceeds 100 megabecquerels.

(5) A person who was, before the commencement of this regulation, in possession of a smoke detector containing no more than 40 kilobecquerels of Americium 241 is exempted from section 34 for the purposes of the disposal of that detector.

[Regulation 7B inserted: Gazette 28 Jan 1994 p. 282; amended: Gazette 11 Nov 1994 p. 5695; 22 Jul 1997 p. 3815.]

7C. Exemption for certain radioactive substances contained in electron capture detector

(1) In this regulation —

ECD substance means either of the radioactive substances Nickel 63 or Hydrogen 3;

electron capture detector means a device —

(a) that contains an ECD substance in a sealed source; and

(b) that is used in a laboratory or industrial application for the specific detection of electron absorbing compounds.

(2) Subject to subregulation (3), an ECD substance contained in an electron capture detector that is part of equipment used for gas chromatography is exempt from the Act and these regulations, other than those provisions relating to the sale or disposal of radioactive substances.

(3) The exemption granted by subregulation (2) only applies if the electron capture detector has a durable label in substantially the form set out in Schedule III affixed in a prominent position on its front surface.

[Regulation 7C inserted: Gazette 11 Nov 1994 p. 5695; amended: Gazette 31 Dec 1999 p. 7061.]

7D. Exemption for Nickel 63 contained in ion mobility spectrometer

(1) In this regulation —

ion mobility spectrometer means a device that contains the radioactive substance Nickel 63 in a sealed source.

(2) Subject to subregulation (3), Nickel 63 contained in an ion mobility spectrometer that is used for the detection of drugs and narcotics is exempt from the Act and these regulations, other than those provisions relating to the sale or disposal of radioactive substances.

(3) The exemption granted by subregulation (2) only applies if the ion mobility spectrometer has a durable label in substantially the form set out in Schedule III affixed in a prominent position on its front surface.

[Regulation 7D inserted: Gazette 31 Dec 1999 p. 7061.]

8. Period for registration

For the purposes of section 28(2)(a), the prescribed period is a period commencing on the coming into operation of the Act and expiring on the 28th day after the day on which this regulation comes into operation.

Part II — General precautions and requirements relating to radiation safety

9. Restriction on advertisements and advertising material

A person shall not state or imply in any advertisement or advertising material that the Council, by issuing a licence, registration, exemption or permit, endorses the efficacy of any procedure (including manufacture, storage, transport, sale, possession, installation, servicing, maintenance or repair) associated with the operation or use of any radioactive substance, irradiating apparatus or electronic product.

[Regulation 9 inserted: Gazette 2 Jan 2004 p. 3.]

10. Applications for licences and registrations, and prescribing of registers

(1) Subject to subregulation (2), an applicant for a licence or for registration shall —

(a) apply therefor in the appropriate form; and

(b) deliver his application to the office of the Council; and

(c) deliver with his application the appropriate fee payable in respect of that application; and

(d) where the applicant seeks approval to carry out industrial radiography, deliver with the application 2 passport sized colour photographs of the head and shoulders of the applicant, dated and signed on the back by the applicant.

(2) A person who is the owner of any premises and of any irradiating apparatus or electronic product or both therein may apply for combined registration of those premises and that irradiating apparatus or electronic product or both and the appropriate fee payable in respect of that application shall be the sum of the appropriate fees payable on separate applications for

the registration of those premises and of that irradiating apparatus or electronic product or both.

(3) The registers to be kept under section 41 shall be in the form of a file relating to each person —

(a) to whom an exemption is granted; or

(b) who is a licensee; or

(c) to whom a permit is granted; or

(d) in whose name any premises, irradiating apparatus or electronic product is registered,

and shall contain the information required to be furnished by him by or under the Act or these regulations.

[Regulation 10 amended: Gazette 29 Nov 1991 p. 5989.]

10A. Industrial radiographers to carry and produce licence cards

(1) An industrial radiographer shall carry a licence card while carrying out any work with irradiating apparatus or radioactive substances.

(2) An industrial radiographer shall, on the request of an authorised officer, produce a valid licence card issued to the industrial radiographer for inspection by the authorised officer.

(3) A licence card is valid at any time before the expiry date set out on the card.

(4) This regulation applies in respect of each individual radiographer only after a licence card has been furnished to that radiographer under regulation 59(16).

[Regulation 10A inserted: Gazette 29 Nov 1991 p. 5989.]

10B. Employment of radiation workers under 16 years of age prohibited

(1) A person shall not employ a person under 16 years of age as a radiation worker.

(2) It is a defence to a prosecution for an offence against subregulation (1) to prove that the defendant believed on reasonable grounds that the person employed was 16 years of age or older.

[Regulation 10B inserted: Gazette 22 Jul 1997 p. 3815.]

11. Personal files

(1) The employer of a radiation worker shall —

(a) keep a continuing personal file relating to the radiation worker; and

(b) include in the personal file referred to in paragraph (a) the results of all personal monitoring of the radiation worker carried out in accordance with these regulations; and

(c) dispose of the personal file referred to in paragraph (a) —

(i) by forwarding it to; or

(ii) in a manner directed in writing by,

the Council and in no other manner.

(2) On the termination of the employment of a radiation worker, the employer of the radiation worker shall —

(a) supply the Council, on request, with a report in writing on —

(i) the effective dose of ionising radiation received by; or

(ii) the exposure to non-ionising radiation of,

the radiation worker as shown in his personal file or, if no personal monitoring or incomplete personal monitoring of the radiation worker has been carried out, on —

(iii) the estimated effective dose of ionising radiation received by; or

(iv) the estimated exposure to non-ionising radiation of,

the radiation worker; and

(b) if the effective dose or estimated effective dose of ionising radiation received by the radiation worker has been such as to require action to be taken under regulation 15 or the radiation worker's exposure or estimated exposure to non-ionising radiation exceeds the appropriate maximum permissible exposure level, include in the report referred to in paragraph (a) particulars of the circumstances leading to that dose or exposure, as the case requires.

(3) An employer who employs or formerly employed a radiation worker shall, at the request of the radiation worker, furnish the radiation worker with a report on the effective dose or estimated effective dose of ionising radiation received by, or the exposure or estimated exposure to non-ionising radiation of, the radiation worker as shown in the personal file relating to him.

(3a) Where an employer receives a dose assessment report from a radiation monitoring organization, the employer shall promptly inform each radiation worker assessed of the results of his assessment.

(4) When a radiation worker whose employment has been terminated is again employed as a radiation worker, his new employer shall —

(a) if he is not the former employer of the radiation worker, obtain from that former employer, and that former employer shall, if he possesses the personal file relating to the radiation worker, give to the new employer of the radiation worker, a copy of the relevant contents of that personal file; and

(b) obtain from the Council, and the Council shall give to the new employer of the radiation worker —

(i) a copy of each report supplied to the Council under subregulation (2) in respect of the radiation worker; and

(ii) if the Council possesses the personal file relating to the radiation worker, a copy of the relevant contents of that personal file.

(5) In subregulation (4) —

relevant contents, in relation to a personal file, means those contents of the personal file consisting of the results referred to in subregulation (1)(b) or otherwise relevant to radiation safety.

[Regulation 11 amended: Gazette 11 Jun 1993 p. 2871; 22 Jul 1997 p. 3815 and 3826.]

12. Records relating to radioactive substances, irradiating apparatus and electronic products

(1) Subject to subregulation (3), the person in whose name any premises are registered shall —

(a) keep records showing the receipt, transfer or disposal of radioactive substances, irradiating apparatus and electronic products in or from those premises; and

(b) retain records relating to —

(i) the receipt of a radioactive substance while the radioactive substance remains in his possession or under his control and thereafter for the period referred to in subparagraph (ii); and

(ii) the transfer or disposal of a radioactive substance for a period equivalent to one half life of the radioactive substance reckoned from the date of the last recorded movement of the radioactive substance, but in any case for a period of not less than 6 months, or for such longer period as the

Council may require by notice in writing sent to that person, from that date; and

(iii) any irradiating apparatus or electronic product while that irradiating apparatus or electronic product remains in his possession and thereafter for a period of not less than 5 years.

(2) If a person required by subregulation (1) to keep and retain any records referred to in that subregulation ceases to carry on business or to practise his profession or dies or is for any other reason unable to continue to keep and retain those records, he or the person responsible for managing his affairs or his estate, as the case requires, shall forthwith surrender those records to the Council.

(3) In subregulation (1)(b)(ii) —

one half life of the radioactive substance means for a single radioactive decay process occurring in the radioactive substance the time required for the radioactivity of the radioactive substance to decrease to half its initial value.

13. Records of surveys, tests and calibrations of equipment

Whenever surveys, tests or calibrations of equipment are required by these regulations to be carried out, the person in whose name the premises, irradiating apparatus or electronic products concerned are registered shall keep records in writing, or in such other manner as the Council approves, of those surveys, tests or calibrations.

14. Reporting of losses and thefts

A person who is —

(a) required to comply with section 28 in respect of; or

(b) in possession or control of,

any radioactive substance, irradiating apparatus or electronic product shall report any loss or theft of that radioactive

substance, irradiating apparatus or electronic product to the Council immediately after he learns of that loss or theft.

15. Action to be taken if excessive dose equivalents of ionising radiation received or excessive concentrations of radioactive substances released

(1) If the licensee in respect of a radioactive substance or irradiating apparatus, the person in whose name any irradiating apparatus is registered or any premises are registered in respect of a radioactive substance or irradiating apparatus, or any person acting under the supervision and direction of such a licensee or person (in this regulation called a ***responsible person***) learns that —

(a) a radiation worker or other person has or may have received from the radioactive substance or irradiating apparatus an effective dose or estimated effective dose of ionising radiation exceeding 3/10 of, but not exceeding, the product obtained by multiplying the effective dose limit by the fraction of the year in respect of which that effective dose or estimated effective dose was recorded or, in the case of an effective dose or estimated effective dose received by a person wearing, operating or using an approved personal monitoring device under regulation 25, by the fraction of the year during which that device was so worn, operated or used, the responsible person shall —

(i) if he is not such a licensee or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires, immediately report that discovery to that licensee or person, and that licensee or person shall; or

(ii) if he is such a licensee or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires,

immediately investigate the circumstances of that receipt or possible receipt and shall, if the person who has or may have received that effective dose or estimated effective dose —

(iii) is or was at the relevant time a radiation worker, place a report on those circumstances on the personal file relating to that person; or

(iv) is not and was not at the relevant time a radiation worker, immediately forward a report on those circumstances to the Council;

or

(b) there has or may have been a release of a radioactive substance from any premises at a concentration which exceeds the appropriate maximum concentration set out in Schedule VIII, but does not exceed 10 times that maximum concentration, the responsible person shall, unless that release is a release permitted by regulation 31 —

(i) if he is not the person in whose name those premises are registered, immediately report that discovery to that person and that person shall; or

(ii) if he is the person in whose name those premises are registered,

immediately investigate the circumstances of that release or possible release and take corrective action, and thereafter report to the Council on that investigation and corrective action within 14 days of taking that corrective action.

(2) If a responsible person learns that —

(a) a radiation worker or other person has or may have received from the radioactive substance or irradiating apparatus concerned an effective dose or estimated effective dose of ionising radiation exceeding the product obtained by multiplying the effective dose limit by the fraction of the year in respect of which that effective dose or estimated effective dose was recorded or, in the case of an effective dose or estimated effective dose received by a person wearing, operating or using an approved personal monitoring device under regulation 25, by the fraction of the year during which that device was so worn, operated or used, but not exceeding 5 times that product, the responsible person shall —

(i) if he is not the licensee in respect of the radioactive substance or irradiating apparatus concerned or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires, immediately report that discovery to that licensee or person, and that licensee or person shall; or

(ii) if he is the licensee in respect of the radioactive substance or irradiating apparatus concerned or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires;

or

(b) there has or may have been a release of a radioactive substance from any premises at a concentration which exceeds 10 times the appropriate maximum concentration set out in Schedule VIII, but does not exceed 1000 times that maximum concentration, the

responsible person shall, unless that release is a release permitted by regulation 31 —

(i) if he is not the person in whose name those premises are registered, immediately report that discovery to that person and that person shall; or

(ii) if he is the person in whose name those premises are registered,

immediately investigate the circumstances of that receipt or possible receipt or of that release or possible release, as the case requires, and, within a period of 7 days after that discovery, report thereon in writing to the Council and take such corrective action as the Council directs.

(3) If a responsible person learns that —

(a) a radiation worker or other person has or may have received from the radioactive substance or irradiating apparatus concerned an effective dose or estimated effective dose of ionising radiation exceeding 5 times the product obtained by multiplying the effective dose limit by the fraction of the year in respect of which that effective dose or estimated effective dose was recorded or, in the case of an effective dose or estimated effective dose received by a person wearing, operating or using an approved personal monitoring device under regulation 25, by the fraction of the year during which that device was so worn, operated or used, the responsible person shall —

(i) if he is not the licensee in respect of the radioactive substance or irradiating apparatus concerned or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires, immediately report that discovery to that licensee or person, and that licensee or person shall; or

(ii) if he is the licensee in respect of the radioactive substance or irradiating apparatus concerned or the person in whose name the irradiating apparatus or premises is or are registered, as the case requires;

or

(b) there has or may have been a release of a radioactive substance from any premises at a concentration which exceeds 1000 times the appropriate maximum concentration set out in Schedule VIII, the responsible person shall, unless that release is a release permitted by regulation 31 —

(i) if he is not the person in whose name those premises are registered, immediately report that discovery to that person and that person shall; or

(ii) if he is the person in whose name those premises are registered,

immediately report all facts relevant to that receipt or possible receipt or to that release or possible release, as the case requires, to the Council, seek to ascertain the cause of that receipt or possible receipt or of that release or possible release and take such corrective action as the Council directs.

(4) A person required by subregulation (3) to report certain facts to the Council shall, as soon as possible after so reporting and in any event not more than 14 days thereafter, report to the Council all additional facts relevant to the receipt or possible receipt concerned or to the release or possible release concerned, as the case requires, which come to the notice of that person after he has so reported under that subregulation.

(5) This regulation does not apply to the exposure to radiation of those parts of the human body necessarily exposed to radiation in the course of any diagnosis or treatment —

(a) conducted or prescribed by a medical practitioner, dentist, chiropractor, podiatrist or physiotherapist; and

(b) conducted in accordance with the Act and these regulations.

[Regulation 15 amended: Gazette 22 Jul 1997 p. 3815 and 3826.]

16. Monitoring instruments

(1) A person in whose name any irradiating apparatus, electronic product or premises is or are registered shall provide such monitoring instruments as the Council directs in writing, within such period as the Council specifies in that direction, for detecting and measuring the type of radiation produced by that irradiating apparatus or electronic product or by any radioactive substance used, manufactured, stored, possessed or otherwise dealt with on those premises, as the case requires.

(2) Without limiting the generality of subregulation (1), a person who uses, manufactures, stores, possesses or otherwise deals with a radioactive substance —

(a) which is not enclosed in a sealed source shall, if so directed in writing by the Council, keep immediately available a monitoring instrument for detecting and measuring contamination by radioactive substances; or

(b) which is enclosed in a sealed source in a quantity which exceeds 4 megabecquerels or 1000 times the appropriate maximum quantity set out in the third column of Schedule V, whichever is the greater, shall keep immediately available a monitoring instrument for detecting and measuring the ionising radiation produced by that radioactive substance.

17. Shielding, protective equipment and safety devices in relation to repair or installation

(1) A person in whose name premises which are used for the repair or installation of irradiating apparatus, electronic products or equipment containing radioactive substances are registered shall, whenever he effects that repair or installation and whether that

repair or installation takes place at those premises or not, provide such shielding, protective equipment and safety devices as are necessary for that repair or installation to be carried out safely.

(2) The Council may direct in writing a person in whose name any premises are registered to provide within the period specified in that direction such shielding, protective equipment and safety devices as are specified in that direction.

(3) A person to whom a direction has been given under subregulation (2) shall comply with that direction.

(4) A licensee and any person acting under his direction and supervision shall, when repairing or installing irradiating apparatus, electronic products or equipment containing radioactive substances, use shielding, protective equipment and safety devices provided in accordance with this regulation or with a direction made thereunder.

18. Appointment of radiation safety officers and radiation safety committees

(1) The registrant of any premises —

(a) shall, subject to this regulation, appoint a radiation safety officer to perform —

(i) on behalf of the registrant, the duties imposed on the registrant by regulations 19(2), 19A(2), 25 and 26;

(ii) the duties imposed on a radiation safety officer by regulation 19(3);

and

(b) may, and if directed to do so by the Council shall, appoint a radiation safety committee to supervise the performance by the radiation safety officer appointed by that registrant of the officer's duties under paragraph (a).

(1a) An appointment made under subregulation (1)(a) or (b) is to be made in writing, however a failure to make the appointment in writing does not affect the validity of the appointment.

(1b) A registrant shall ensure that a radiation safety officer appointed by that registrant carries out the duties imposed on the officer under regulation 19(3).

(2) It shall not be necessary for the registrant to appoint a radiation safety officer under subregulation (1)(a) if, with the consent in writing of the Council, he performs both —

(a) the duties imposed on him by regulation 19(2); and

(b) the duties imposed on a radiation safety officer by regulation 19(3).

(3) Before appointing a radiation safety officer or a radiation safety committee under subregulation (1), the registrant shall obtain the approval in writing of the Council in respect of the person or persons to be appointed.

(4) The appointment of a radiation safety officer or of a radiation safety officer and a radiation safety committee, as the case requires, does not relieve the registrant making that appointment of liability for any failure to perform —

(a) any of the duties imposed on that registrant by regulation 19(2), 19A(2), 25 or 26; or

(b) the duties imposed on a radiation safety officer by regulation 19(3).

(5) A person shall not be appointed under subregulation (1) to be a radiation safety officer unless he —

(a) has passed an examination in radiation safety conducted by or on behalf of the Council in accordance with the *Radiation Safety (Qualifications) Regulations 1980*; or

(b) possesses an approved qualification.

(6) A registrant shall, on appointing a radiation safety officer, notify that officer in writing of —

(a) the duties —

(i) which the radiation safety officer is required to carry out on behalf of the registrant under regulation 18(1)(a)(i); and

(ii) imposed on the radiation safety officer by regulation 19(3);

and

(b) any conditions, restrictions or limitations which are imposed under section 36 on the registration of —

(i) the premises; or

(ii) any irradiating apparatus or electronic product on the premises or any field sites under the control of the registrant.

(7) The registrant shall in writing notify the radiation safety officer appointed by that registrant if the duties referred to in subregulation (6)(a) or the conditions, restrictions or limitations referred to in subregulation 6(b) change.

[Regulation 18 amended: Gazette 22 Jul 1997 p. 3816-7.]

19. Responsibility for radiation safety precautions generally

[(1) deleted]

(2) The registrant of any premises shall, in relation to those premises and any field sites under the control of the registrant —

(a) inform himself of the hazards attendant on the presence of radiation and may for that purpose obtain the advice and services of a qualified expert; and

[(b) deleted]

(c) ensure that each radiation worker and each person authorised by the registrant to visit areas where radiation may be present is —

(i) properly and adequately instructed in the use of all necessary safeguards and procedures; and

(ii) supplied with such shielding, protective equipment and safety devices as may be necessary for the person's safety;

and

(ca) ensure that each radiation worker is —

(i) provided with copies of, or access to, instruction or operating manuals for all devices or things containing radioactive substances and for all irradiating apparatus and electronic products which that worker uses or operates; and

(ii) given specific instructions on how to use the radioactive substances and how to use or operate the irradiating apparatus and electronic products which that worker uses or operates so as to minimize any potential exposure to radiation of the worker, other employees or the public; and

(iii) instructed in radiation safety; and

(iv) familiar with any working rules prepared under subregulation (3)(a) for the radioactive substances, irradiating apparatus and electronic products which that worker uses or operates,

to a level appropriate for the worker's functions; and

(cb) ensure that each radiation worker is —

(i) licensed; or

(ii) supervised by, and under the direction of, a person who is licensed; or

(iii) exempt from the requirement to be licensed;

and

(d) notify the Council in writing as soon as practicable after becoming aware of any of the following situations —

(i) any areas which are not normally occupied by human beings but in which visiting human beings may be exposed to hazardous radiation; and

(ii) any condition or situation which, although not normally considered to be a radiation hazard, may become a radiation hazard under special or unusual circumstances; and

(iii) a radiation hazard which emanates from a source of radiation (whether or not on the premises or field site) which is not under the control of the registrant.

(3) The radiation safety officer appointed by a registrant shall, in relation to that registrant's premises and any field sites under the control of that registrant —

(a) prepare working rules for the safe use and operation of radioactive substances, irradiating apparatus and electronic products if —

(i) directed to do so in writing by the Council; or

(ii) required to do so under these regulations; or

(iii) required to do so by a condition, restriction or limitation imposed under section 36 on the registration of those premises or of any irradiating apparatus or electronic product;

and

(b) ensure that —

(i) no radioactive substances are manufactured, used or stored; and

(ii) no irradiating apparatus or electronic products are installed,

in any place unless —

(iii) the Council has approved plans for that place which set out details of —

(I) its dimensions; and

(II) the materials used, or to be used, in its construction; and

(III) if unsealed radioactive substances are to be used in that place, the ventilation, drainage, sewage disposal and lighting systems installed or to be installed; and

(IV) its proximity to other parts of the premises or field site and to places outside the premises or field site and the likely effect on them of the proposed use of that place; and

(V) any other details requested by the Council;

and

(iv) that place conforms to those plans;

and

(c) ensure that all appropriate shielding, safety devices, protective equipment, radiation monitoring and radiation surveying devices required by these regulations or by a condition, restriction or limitation imposed under section 36 to be installed or available are —

(i) installed or available; and

(ii) regularly tested and serviced; and

(iii) repaired or replaced when necessary;

and

(d) make recommendations to the registrant on the need or otherwise for the medical examination of radiation workers; and

(e) maintain all records required by the Act or these regulations to be kept by the registrant; and

(f) ensure that any conditions, restrictions or limitations imposed under section 36 on the registration of —

(i) the premises; or

(ii) any irradiating apparatus or electronic product,

of which the radiation safety officer has been notified, are complied with; and

(g) notify the registrant of any suspected or known contravention of —

(i) these regulations; or

(ii) any condition, restriction or limitation imposed under section 36 on the registration of —

(I) the premises; or

(II) any irradiating apparatus or electronic product,

as soon as practicable after becoming aware of it; and

(h) if any person is unnecessarily exposed to radiation, evaluate the radiation dose received by that person in accordance with any directions given by the Council; and

(i) notify the registrant of —

(i) the exposure of any person (other than a patient exposed for diagnostic or therapeutic purposes) to a radiation dose which exceeds the limits calculated under regulation 15; or

(ii) any abnormal or unplanned radiation exposure as set out in regulation 19A(1).

(4) A radiation worker shall not use any radioactive substances or use or operate any irradiating apparatus or electronic product, the registration of which is required by section 28, without the prior permission of the registrant.

[Regulation 19 amended: Gazette 22 Jul 1997 p. 3817-20.]

19A. Abnormal or unplanned radiation exposures

(1) An abnormal or unplanned radiation exposure occurs if —

(a) during the administration of a radioactive substance for diagnostic purposes, the quantity of the substance administered exceeds the quantity prescribed by the responsible licensee by 50% or more; or

(b) during the administration of radiation for therapeutic purposes, the radiation dose or the energy or power imparted to the patient differs from that prescribed by the responsible licensee by 15% or more; or

(c) there is an unintended emission of radiation as a result of damage to, or the malfunction of —

(i) an irradiating apparatus; or

(ii) an electronic product; or

(iii) a device or thing containing a radioactive substance; or

(iv) a device controlling the application of radiation from a radioactive substance;

or

(d) a radioactive substance which was not prescribed by a licensee for diagnostic or therapeutic purposes, is used for one of those purposes; or

(e) a surface, substance or material is contaminated by a radioactive substance resulting from the spillage of more than 10 times the exempt quantity of that substance specified in Schedule V; or

(f) a radioactive substance is unlawfully released into the environment in a concentration exceeding the levels specified in regulation 31.

(2) As soon as practicable after becoming aware of any abnormal or unplanned radiation exposure occurring on the premises or a field site, the registrant shall —

(a) notify the Council in writing of the exposure; and

(b) ascertain the cause of the exposure; and

(c) if the cause of the exposure was damage to, or the malfunction of, any irradiating apparatus, electronic product, device or thing referred to in subregulation (1)(c) —

(i) cause the apparatus, product, device or thing to be repaired or removed from the premises or field site and taken to a safe place; and

(ii) ensure that, until it is so repaired or removed —

(I) it is not used; or

(II) if the damage or malfunction can be isolated without adversely affecting the safety or performance of the apparatus, product, device or thing, that it is so isolated;

and

(d) inform any person who may have been exposed to the abnormal or unplanned radiation exposure of —

(i) the occurrence of the exposure; and

(ii) the actions taken to rectify the situation and to prevent a recurrence.

(3) A notification given under subregulation (2)(a) is to include details of —

(a) the nature, type and cause of the abnormal or unplanned radiation exposure; and

(b) the location and time of, and the people involved in, its occurrence; and

(c) the area over which any radioactive substance may have been dispersed; and

(d) any personal injury or exposure sustained by any person, including an assessment of the radiation dose received; and

(e) the actions taken to rectify the situation and to prevent a recurrence.

(4) In subregulation (2)(c) —

repaired means repaired by an approved person and certified by that person as functioning correctly and fit to be returned to use.

[Regulation 19A inserted: Gazette 22 Jul 1997 p. 3820-1.]

20. Manufacture, use etc. to be confined to certain premises

(1) Subject to subregulation (2), the person in whose name any premises are registered shall ensure that —

(a) the manufacture, use or storage of any radioactive substance; and

(b) the use or operation, other than the repair, testing or installation, of any irradiating apparatus or electronic product,

in respect of which that registration was effected is carried out only on those premises.

(2) If the Council has by any condition imposed by it in relation to the registration of premises permitted —

(a) the manufacture, use or storage of any radioactive substance; or

(b) the use or operation, other than the repair, testing or installation, of any irradiating apparatus or electronic product,

in respect of which that registration was effected to be carried out on any other premises specified in that condition, the person in whose name the first-mentioned premises are registered shall ensure that that manufacture, use, storage or operation is carried out only on the first-mentioned premises or the other premises so specified or on both.

21. Medical examinations

(1) The Council may require persons exposed or likely to be exposed in the course of their employment to a radiation hazard to undergo medical examinations —

(a) before that employment commences; and

(b) periodically during that employment; and

(c) after that employment ends,

and at such other times as the Council considers necessary.

(2) A person required under subregulation (1) to undergo a medical examination shall comply with that requirement.

(3) The employer of a person who undergoes a medical examination in compliance with a requirement under subregulation (1) shall —

(a) if that person is a radiation worker, cause the result of the medical examination to be recorded in the personal file relating to that person; and

(b) whether or not that person is a radiation worker, notify the Council of the result of the medical examination if the Council so requests.

[Regulation 21 amended: Gazette 22 Jul 1997 p. 3821.]

22. Warning signs and labels

(1) The person in whose name any premises in areas of which radioactive substances, irradiating apparatus or electronic products are manufactured, operated, used or stored are registered shall —

(a) unless exempted by the Council in writing, cause conspicuous signs, bearing the radiation warning symbol and approved wording, to be posted in those areas; and

(b) cause signs posted under this subregulation to be removed when those radioactive substances, irradiating apparatus or electronic products are no longer present in those areas.

(2) A licensee in respect of a radioactive substance or a person in whose name an irradiating apparatus or electronic product is registered shall cause labels —

(a) to be affixed in accordance with these regulations to every container in which the radioactive substance is kept or to the irradiating apparatus or electronic product, as the case requires; and

(b) affixed under this subregulation to be removed when the radioactive substance and its container or the irradiating apparatus or electronic product is no longer capable of emitting radiation.

(3) Subject to subregulations (1) and (2), a person shall not remove signs or labels posted or affixed under those subregulations except with the approval of the Council.

(4) The Council may direct the person in whose name any premises are registered to exhibit copies of these regulations at locations readily accessible to employees, and copies of working rules required to be formulated by regulation 19(3)(c) adjacent to or on —

(a) containers or equipment in which a radioactive substance is kept or incorporated; or

(b) irradiating apparatus or electronic products, which are on the premises.

(5) A person to whom a direction has been given under subregulation (4) shall comply with that direction.

(6) This regulation does not apply to lasers.

23. Radiation surveys and calibrations

(1) The person in whose name premises, irradiating apparatus or electronic products are registered shall make or cause to be made such radiation surveys as are necessary for compliance with the requirements of the Act and these regulations.

(2) The Council may direct the person in whose name premises, irradiating apparatus or electronic products are registered —

(a) to cause to be made a radiation survey, test or calibration of the premises or of a device or material used for the production of radiation or for protection therefrom, as the case requires, and to cause a report to be compiled on that radiation survey, test or calibration; and

(b) to furnish the Council with a copy of each report compiled in compliance with a direction given under this subregulation.

(3) A person who has received a direction given under subregulation (2) shall comply with that direction.

(4) Surveys, tests or calibrations referred to in subregulations (1) and (2) shall be made —

(a) by or under the direction and supervision of an approved person; and

(b) by means of approved instruments and methods.

(5) The Council may accept as evidence of the absence of a radiation hazard in a given area, in lieu of a report compiled on an actual radiation survey made in accordance with this regulation, a statement in writing made by a qualified expert on

the basis of his inspection and analysis of the radiation producing sources concerned, of their location on the premises concerned and of the circumstances of their operation or use.

[Regulation 23 amended: Gazette 11 Jun 1993 p. 2871.]

24. Dose equivalent limits and maximum permissible exposure levels not to be exceeded

(1) Subject to subregulation (2), a person operating or using, or engaged in an activity operating or using, a particular radioactive substance, irradiating apparatus or electronic product shall not act in such a manner as knowingly —

(a) to receive or to cause another person to receive a dose of ionising radiation exceeding the appropriate effective dose limit, equivalent dose limit or dose limit specified in item 1(2)(b) of Schedule I, as the case requires; or

(b) to be exposed to or to cause another person to be exposed to a level of non-ionising radiation exceeding the appropriate maximum permissible exposure level.

(2) A person operating or using, or engaged in an activity operating or using, a radioactive substance or irradiating apparatus in the course of a single planned special exposure conducted with the prior approval of the Council shall not act in such a manner as knowingly to receive or to cause another person to receive a dose of ionising radiation exceeding the effective dose limit specified in item 1(4) of Schedule I.

(3) This regulation does not apply to a person operating or using, or engaged in an activity operating or using, a radioactive substance, irradiating apparatus or electronic product who acts in a manner prohibited by this regulation in rescuing or safeguarding a person from serious injury or danger to life or in preventing the exposure of 2 or more persons to a radiation hazard.

(4) This regulation does not apply to the exposure to radiation of those parts of the human body —

(a) necessarily exposed thereto in the course of any diagnosis or treatment by or prescribed by a medical practitioner, dentist, chiropractor or physiotherapist; and

(b) conducted in accordance with the Act and these regulations (other than this regulation).

(5) Notwithstanding anything contained in subregulation (4), a licensee or any other person using a radioactive substance, irradiating apparatus or electronic product for diagnosis in respect of, or the treatment of, a human patient shall —

(a) not unnecessarily expose to radiation those parts of the human body which are not the subject of; and

(b) if the reproductive organs of that patient are or may be exposed to a direct x-ray beam, apply protective shielding to those organs unless that application might interfere with,

that diagnosis or treatment.

[Regulation 24 amended: Gazette 28 Jan 1994 p. 282; 22 Jul 1997 p. 3822 and 3826.]

25. Personal monitoring devices

(1) Unless subregulation (7) applies or the Council has granted a registrant an exemption in writing, a registrant shall ensure that an approved personal monitoring device is issued to every designated radiation worker on the registered premises or on a field site, and that every such worker is given adequate instruction and training in the use of the device.

(2) The Council may in writing require a designated radiation worker to wear on various parts of the body personal monitoring devices of a kind nominated by the Council.

(3) A registrant shall ensure that —

(a) a personal monitoring device is used by a designated radiation worker for not longer than the period specified in the literature issued with the device;

(b) except where otherwise approved, every designated radiation worker is instructed to wear the personal monitoring device issued to him during the course of his work and under any radiation protective clothing that is used;

(c) every designated radiation worker is instructed that the personal monitoring device issued to him is not to be worn or used by any other person except in approved circumstances;

(d) every designated radiation worker is instructed to take care to protect the personal monitoring device issued to him as far as practicable from heat, chemicals, immersion and ionising radiation while the device is not being worn;

(e) at the end of its permitted period of use, each personal monitoring device is returned to the monitoring organization for assessment, together with a statement of the name of the designated radiation worker who wore the device and the kinds of radiation to which he may have been exposed.

(4) A person to whom a personal monitoring device has been issued shall, unless otherwise instructed by the registrant concerned —

(a) wear the device during the course of his work and under any radiation protective clothing that is used; and

(b) not permit the device to be worn by any other person.

(5) A registrant who is also a designated radiation worker shall comply with the obligations that attach to such workers under this regulation.

(6) A person shall not —

(a) tamper with a personal monitoring device; or

(b) expose a personal monitoring device to radiation deliberately; or

(c) unnecessarily subject a personal monitoring device to heat, chemicals or other agents that may affect its reading.

(7) Except where otherwise directed by the Council, a person using any of the following kinds of equipment or substances is not required to wear a personal monitoring device —

(a) fully enclosed x-ray analysis apparatus where interlocks do not have to be bypassed;

(b) portable mineral analysers or portable alloy analysers;

(c) radiation gauges that are fixed to structures or equipment and that comply with regulation 27(4);

(d) cabinet x-ray apparatus that complies with the NHMRC's Statement on Cabinet X-Ray Equipment (1987) or x-ray apparatus for special applications that complies with the NHMRC's Statement on Enclosed X-Ray Equipment for Special Applications (1987);

(e) the substances as quantified —

Carbon 14	No limit
Hydrogen 3	No limit
Iodine 125	≤ 2 MBq
Sulphur 35	No limit;

(f) when used for educational purposes, the substances as quantified —

Americium 241	≤ 0.02 MBq
Caesium 137	≤ 0.2 MBq
Cobalt 60	≤ 0.2 MBq
Strontium 90	≤ 0.08 MBq
Radium 226	≤ 0.02 MBq.

(8) In any legal proceedings where it is an issue, it shall be presumed, unless the contrary is proved, that a designated radiation worker to whom a personal monitoring device was issued wore and handled the device in accordance with this regulation.

(9) Where a designated radiation worker who is required to wear a personal monitoring device does not do so, or a device issued to the worker is lost, damaged or destroyed, and it is impossible to ascertain the amount of radiation to which the worker was exposed during the period when the device was not worn, the Council may, taking into account the nature of the employment of the worker, estimate the effective dose received by the worker and the effective dose estimated shall be presumed, unless the contrary is proved, to be the effective dose received by the worker during that period.

(10) Where the type of radiation emitted by a radioactive substance, irradiating apparatus or electronic product is of such a nature that there is no suitable personal monitoring device for measuring that type of radiation, the person in whose name the radioactive substance, irradiating apparatus or electronic product is registered shall —

(a) immediately notify the Council; and

(b) make such arrangements as the Council directs in writing for monitoring the radiation.

(11) Without limiting the operation of regulation 57, a person who contravenes this regulation is liable to a minimum penalty of $100.

[Regulation 25 inserted: Gazette 11 Jun 1993 p. 2871-3; amended: Gazette 22 Jul 1997 p. 3826.]

25A. Radiation monitoring organizations

(1) A registrant shall only use the services of radiation monitoring organizations that have been approved.

(2) The Council may direct a registrant to require a radiation monitoring organization to provide copies of dose assessments directly to the Council and without delay.

(3) The Council may direct a registrant to authorise direct communication between a radiation monitoring organization and officers authorised by the Council if such direct communication is necessary to facilitate inquiries into a known or suspected radiation dose.

[Regulation 25A inserted: Gazette 11 Jun 1993 p. 2873.]

26. Monitoring of radiation otherwise than by personal monitoring devices

(1) The person in whose name any premises are registered shall, if directed in writing by the Council to do so, place on those premises from time to time in accordance with that direction approved equipment or devices for detecting and measuring radiation for the purpose of monitoring the presence of radiation on those premises.

(2) A person who has placed approved equipment or devices in accordance with a direction given under subregulation (1) shall, whenever it is necessary for the approved equipment or devices to be examined or for any film therein to be processed in order to ascertain the amount of radiation present on the premises concerned, cause the approved equipment or devices to be examined, or that film to be processed or changed, and the amount of radiation detected to be measured, in such manner, by such persons and at such times as the Council directs in writing.

Part III — Radioactive substances

27. Restrictions on activities of licensees and others in respect of radioactive substances

(1) A licensee shall not administer or purport to authorise the administration of radioactive substances or the radiation emitted thereby for the treatment of, or diagnosis in respect of, human beings unless he is a medical practitioner who has satisfied the Council that he has appropriate specialist qualifications and experience or is working under the direction and supervision of such a medical practitioner.

(2) A licensee shall not use radioactive substances for industrial radiography unless in so doing he complies with the requirements of the NHMRC publication entitled "Code of Practice for the Safe Use of Industrial Radiography Equipment 1989".

(3) A licensee shall not use radioactive substances for the treatment of animals unless he is —

(a) a medical practitioner who does so in association with a veterinarian; or

(b) a veterinarian.

(4) A licensee must not use sealed sources in radiation gauges unless in so doing the licensee complies with the requirements of the publication entitled "Code of Practice and Safety Guide for the Safe Use of Fixed Radiation Gauges (2007)" published by the Australian Radiation Protection and Nuclear Safety Agency in 2007.

(5) A person shall not mine or mill any radioactive ore unless he does so —

(a) under the direction and supervision of a licensee who is normally in attendance at the site of that mining or milling; and

(b) in the case of the mining or milling of radioactive ores, including mineral sands, in accordance with the requirements of the publication entitled "Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining Mineral Processing (2005)" published by the Australian Radiation Protection and Nuclear Safety Agency in 2005.

[Regulation 27 amended: Gazette 15 Mar 1991 p. 1127; 22 Jul 1997 p. 3822; 17 Aug 2010 p. 4046; SL 2022/93 r. 8.]

28. Conditions on registration of premises

(1) The Council may, as a condition imposed in relation to the registration of any premises in which a radioactive substance is or is to be manufactured, used or stored —

(a) specify the maximum quantity of the radioactive substance which may be manufactured, used or stored in those premises or any part thereof; and

(b) in the case of premises where industrial radiography employing sealed sources is carried out, require that the apparatus concerned and those sources conform to the requirements set out in the NHMRC publication entitled "Code of Practice for the Safe Use of Industrial Radiography Equipment 1989" and that that apparatus, the sealed sources and any associated equipment are operated or used in conformity with those requirements; and

(c) in the case of premises where self-luminous devices containing more than 1.8 gigabecquerel of Hydrogen-3 are installed, require that those devices conform to the requirements set out in the publication entitled "The Recommendations for Exemptions from Licensing of Gaseous Tritium Light Devices" approved by the NHMRC at its 81st Session in October 1975; and

(d) in the case of premises where the mining or milling of radioactive ores, including mineral sands, is carried on, require that that mining or milling be carried out in accordance with the requirements of the publication entitled "Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining Mineral Processing (2005)" published by the Australian Radiation Protection and Nuclear Safety Agency in 2005; and

(e) require that equipment for the safe manufacture, use or storage of the radioactive substance be provided; and

(f) require that those premises be constructed in a specified manner using specified materials; and

(g) if radiation gauges incorporating sealed sources are installed in those premises, require —

(i) that those gauges and sealed sources conform to the requirements set out in the publication entitled "Code of Practice and Safety Guide for the Safe Use of Fixed Radiation Gauges (2007)" published by the Australian Radiation Protection and Nuclear Safety Agency in 2007 (the ***Code***); and

(ii) that those gauges are employed in accordance with the procedure laid down by the Code.

(2) A licensee or person acting under his direction and supervision shall use on the premises where he carries on business any equipment for the safe manufacture, use or storage of radioactive substances provided in compliance with a requirement made under subregulation (1)(e).

(3) The person in whose name premises are registered shall ensure that —

(a) quantities of radioactive substances exceeding those maximum quantities specified under subregulation (1)(a) are not brought onto the premises; and

(b) the requirements set out in the publication referred to in subregulation (1)(g) are complied with in relation to the gauges and sealed sources concerned; and

(c) in the case of premises where industrial radiography is carried out, the requirements of these regulations and of the NHMRC publication entitled "Code of Practice for the Safe Use of Industrial Radiography Equipment 1989" are complied with in relation to industrial radiography using radioactive substances; and

(d) in the case of premises where cobalt teletherapy equipment is present, that the equipment is installed and used in accordance with the requirements set out in Schedule XVI.

[Regulation 28 amended: Gazette 10 Oct 1986 p. 3844; 15 Mar 1991 p. 1127; 4 Mar 1994 p. 837; 22 Jul 1997 p. 3822; 17 Aug 2010 p. 4046-7.]

28A. Exemption from registration of premises for temporary storage while in transit

(1) The owner of premises used for the storage of radioactive substances is exempt from the requirements of section 28 if —

(a) radioactive substances are stored at the premises only while they are being transported between 2 other premises; and

(b) each package containing a radioactive substance is stored on the premises for 24 hours or less; and

(c) packages containing radioactive substances are, at all times while they are on the premises, kept —

(i) under the control of a person who holds a licence for the storage or transport of radioactive substances; and

(ii) in a part of the premises to which the public does not have access.

(2) This regulation does not affect the application or operation of the *Radiation Safety (Transport of Radioactive Substances) Regulations 2002*.

[Regulation 28A inserted: Gazette 31 Dec 1999 p. 7061-2; amended: Gazette 26 Mar 2002 p. 1747.]

29. Labelling of radioactive substances

(1) The person in whose name premises are registered in respect of the manufacture, use or storage of radioactive substances shall ensure that —

(a) all storage containers of radioactive substances, storage areas for radioactive substances, work areas or other areas where a radiation hazard arising from the manufacture, use or storage of radioactive substances may exist are posted with appropriate radiation hazard labels except when, in the opinion in writing of the Council notified to that person, those labels may be a source of disturbance to patients undergoing radiation treatment, in which case no such posting shall be effected; and

(b) radiation hazard labels referred to in paragraph (a) incorporate the radiation warning symbol unless the Council by notice in writing notified to that person otherwise directs; and

(c) except as otherwise directed in writing by the Council —

(i) containers for radioactive substances are clearly and permanently labelled "CAUTION — RADIOACTIVE"; and

(ii) equipment containing radioactive substances is labelled "CAUTION — RADIOACTIVE";

and

(d) every container of radioactive substances bears a clearly visible label identifying its contents; and

(e) every label referred to in this subregulation is durable, having regard to the period for which it is required to be attached, and has clearly legible lettering which, together with the radiation warning symbol, if any, referred to in paragraph (b), is surrounded by a black border.

(2) The person in whose name premises are registered may provide on or near any label referred to in subregulation (1) any information —

(a) which is additional to that required by that subregulation; and

(b) which is appropriate in aiding individuals to minimize exposure to radiation and, if that label relates to a container or equipment containing radioactive substances, to identify those radioactive substances.

30. Storage of radioactive substances

The person in whose name any premises are registered in respect of the manufacture, use or storage of radioactive substances shall ensure that —

(a) radioactive substances which are not in use are kept or stored in such a manner that —

(i) the absorbed dose rate in air in any area accessible to persons other than radiation workers and outside the place of storage does not exceed 25 micrograys per hour; and

(ii) no person receives an effective dose exceeding the appropriate effective dose limit;

and

(b) every area used for the keeping or storage of radioactive substances is posted with a sign bearing the radiation warning symbol, the word “radioactive” or “radiation” and such other wording as is approved, and the name of

the person in whose name those premises are registered; and

(c) vaults or rooms used for keeping or storing radioactive substances which are capable of emitting radioactive gases are ventilated in such a manner that any accumulation of radioactive gases does not exceed the appropriate maximum concentration specified in Schedule VIII; and

(d) radioactive substances which are not in use are —

(i) in the case of radioactive substances which are not radioactive ores, enclosed in containers of such construction, materials or thickness or are otherwise shielded in such a manner; or

(ii) in the case of radioactive ores, enclosed in containers of such construction, materials or thickness or are otherwise shielded in such a manner, or are kept at such a distance from areas to which unprotected persons have access, or are both so shielded and kept,

that no person is exposed to an effective dose in excess of the appropriate effective dose limit; and

(e) except in the case of containers for radioactive substances which are radioactive ores, containers for radioactive substances specified in the second column of Schedule V in quantities in excess of 100 000 times the amounts specified opposite to those radioactive substances in the third column of that Schedule are designed to be resistant to fire and earthquake damage and to temperatures up to and including 800°C and are structurally sound, having regard to any corrosion, radiation effects and temperatures to which they may be subjected; and

(f) whenever it is possible that chemical, radiation or other action may weaken or rupture a container of radioactive substances sufficiently to cause leakage from that container, that container is provided with suitable

secondary containment adequate to contain the entire quantity of radioactive substances in that container.

[Regulation 30 amended: Gazette 22 Jul 1997 p. 3826.]

31. Release or disposal of radioactive substances

(1) A person shall not knowingly cause or allow any radioactive substances to be released or disposed of in such a manner as to cause such contamination of the environment as to result in a person receiving an effective dose in excess of the appropriate effective dose limit.

(2) If, notwithstanding that the release or disposal of any radioactive substances in a particular manner would not cause such contamination of the environment as to result in a person receiving an effective dose in excess of the appropriate effective dose limit, the Council is satisfied that such a release or disposal can reasonably be reduced in concentration or quantity or both, the Council may direct the person causing or allowing that release or disposal to effect such reduction of that release or disposal in such manner as is specified in that direction.

(3) A person to whom a direction is given under subregulation (2) shall comply with that direction.

(4) Subject to subregulations (5) and (6), a person shall not, except in accordance with approved waste disposal procedures embodied in a condition imposed in relation to a particular exemption, licence, temporary permit or registration, allow the release from any premises of radioactive substances in liquid or gaseous form in concentrations exceeding the appropriate maximum concentrations set out in Table II of Schedule VIII.

(5) Subject to subregulation (6), a person shall not knowingly discharge radioactive waste into a sewerage system unless —

(a) the radioactive substance in that waste is readily soluble or dispersable in water; and

[(b) deleted]

(c) the concentration of the radioactive substance in that waste discharged during any month (in this paragraph called the ***month of discharge***) into that system from the premises concerned, ascertained by —

(i) determining the average quantity of water discharged per month into that system from those premises during the period of 12 months ending immediately before the month of discharge; and

(ii) dividing the average quantity referred to in subparagraph (i) into the amount of the radioactive substance discharged into that system during the month of discharge,

does not exceed the appropriate maximum concentration set out in column 2 of Table I of Schedule VIII; and

(d) in the case of —

(i) one radioactive substance specified in the second column of Schedule V in that waste discharged into that system from the premises concerned in any period of 12 months, the gross quantity of that radioactive substance does not exceed 100 000 times the maximum quantity specified opposite to that radioactive substance in the third column of that Schedule; or

(ii) 2 or more radioactive substances specified in the second column of Schedule V in that waste discharged into that system from the premises concerned in any period of 12 months, the sum of the numbers obtained by dividing the number of megabecquerels of each of those radioactive substances by the maximum quantity specified opposite to each of those radioactive substances in the third column of that Schedule is less than 100 000.

(6) This regulation does not apply to the discharge from a private residence into a sewerage system of radioactive waste contained in excreta from individuals who are or have been undergoing medical diagnosis or treatment with radioactive substances.

(7) A licensee or the person in whose name premises are registered shall not dispose of, or permit the disposal of, radioactive substances by incineration otherwise than in accordance with the authority in writing of the Council.

(8) A person shall not dispose of any solid radioactive waste otherwise than in the manner provided by any relevant condition imposed in relation to an exemption, licence, temporary permit or registration held by him or, if no such condition is so imposed, in accordance with approved procedures.

[Regulation 31 amended: Gazette 10 Oct 1986 p. 3845; 22 Jul 1997 p. 3826.]

31A. Near-surface disposal of radioactive waste

(1) In this regulation —

code of practice means the publication entitled "Code of practice for the near-surface disposal of radioactive waste in Australia (1992)", approved at the 114th session of the NHMRC;

disposal facility, ***disposal site*** and ***near-surface disposal*** have the respective meanings given in the code of practice.

(2) Without limiting regulation 31 and subject to subregulation (3), a person shall not dispose of, or permit the disposal of, solid radioactive waste by near-surface disposal unless the disposal, the disposal facility and the disposal site comply with the requirements of the code of practice.

(3) Subregulation (2) does not apply to a disposal of solid radioactive waste exempted by the Council from the requirements of the code of practice.

[Regulation 31A inserted: Gazette 11 Nov 1994 p. 5695-6; amended: Gazette 22 Jul 1997 p. 3822.]

32. Records, reports and notifications relating to radioactive substances

(1) A licensee shall in such manner as is approved maintain records of the amounts, kinds, movements and dispositions of radioactive substances used, manufactured, stored, transported, sold, possessed or otherwise dealt with by him.

(2) The person in whose name any premises are registered shall maintain records in such manner as is approved of the amounts, kinds, movements and dispositions of radioactive substances —

(a) in respect of which an exemption has been granted; and

(b) used, manufactured, stored, transported, sold, possessed or otherwise dealt with on, to or from, as the case requires, those premises.

(3) Whenever a radioactive substance specified in the second column of Schedule V and in a quantity exceeding 100 times the maximum quantity specified opposite to that radioactive substance in the third column of that Schedule is unintentionally released, the licensee in respect thereof or, if that licensee does not have immediate control of that radioactive substance, the person having immediate control thereof shall report full particulars of that release to the Council within 7 days of learning of that release.

(4) The person in whose name any premises in, to or from, as the case requires, which a radioactive substance is or has been used, manufactured, stored, transported, sold, possessed or otherwise dealt with are registered shall, not less than 15 days before those

premises are vacated, notify the Council in writing that those premises are to be vacated.

(5) On receipt of notification under subregulation (4) the Council may require in writing the person in whose name the premises concerned are registered to cause those premises to be decontaminated within such period as the Council specifies to a degree consistent with the use of those premises for purposes other than the use, manufacture, storage, transport, sale, possession or other dealing with radioactive substances and that person shall comply with that requirement.

(6) In the case of loss of or damage to a radioactive source, the licensee in respect of the radioactive substance concerned or, if that licensee does not have immediate control of that radioactive substance, the person having immediate control thereof shall, immediately on learning of that loss or damage, report that loss or damage to the Council.

33. Control of exposure to radiation

(1) Subject to subregulations (2), (3) and (4), a licensee shall not use, manufacture, store, transport, sell, possess or otherwise deal with a radioactive substance in such a manner as to cause a radiation worker to be exposed to airborne radioactive material in a concentration which if averaged over a period of exposure of 40 hours per week for 52 weeks would exceed that set out in column 1 of Table I of Schedule VIII.

(2) For the purposes of subregulation (1) —

(a) ***to be exposed*** means to be present in an airborne concentration of the radioactive material concerned; and

(b) no allowance shall be made for —

(i) the use by the radiation worker concerned of protective clothing or equipment; or

(ii) the size of the particles of the radioactive material concerned,

unless the Council authorises the licensee, in writing, to make allowances for either or both of those matters.

(3) The maximum concentrations specified in column 1 of Table I of Schedule VIII are based on exposure to airborne radioactive material in the concentrations specified in that column for 40 hours in any period of 7 consecutive days.

(4) When the number of hours of exposure to airborne radioactive material —

(a) is more than 40 in any period of 7 consecutive days, the maximum concentrations specified in column 1 of Table I of Schedule VIII shall be decreased by an amount which bears the same proportion to those maximum concentrations as the amount of the excess in the number of hours of that exposure bears to 40 hours; or

(b) is less than 40 in any period of 7 consecutive days, the maximum concentrations specified in column 1 of Table I of Schedule VIII shall be unchanged.

(5) If the nature of any work with a radioactive substance is such that the person performing that work or his clothing may become contaminated by a radioactive substance to such a degree as to present a hazard to that or any other person (in this subregulation called the ***person at risk***), the radiation safety officer, if any, appointed in respect of the premises concerned shall —

(a) monitor both the person at risk and his clothing; and

(b) cause to be removed from the person at risk before he is permitted to leave the work area concerned any contamination in excess of —

(i) in the case of alpha-emitting radioactive substances, 3.7×10^{3} becquerels per square metre; or

(ii) in the case of beta-emitting radioactive substances, 3.7×10^{4} becquerels per square metre;

and

(c) ensure that any clothing or other material contaminated by a radioactive substance is not taken from the work area concerned or released to public laundries or cleaners until it has been shown that the contamination does not exceed an approved limit.

(6) A person shall —

(a) not hinder or obstruct; or

(b) when called on to do so, assist,

a radiation safety officer in the performance of the duties imposed on him by subregulation (5).

(7) A licensee in respect of the use of radioactive substances not enclosed in sealed containers shall post in a prominent place in the vicinity of those radioactive substances a list of approved instructions to be followed in the event of accidental contamination of a person or object.

[Regulation 33 amended: Gazette 22 Jul 1997 p. 3823.]

Part IV — Irradiating apparatus

34. Exemption from licensing in relation to irradiating apparatus

(1) The following persons are exempt for the purposes of sections 25 and 27 of the Act —

(a) a dentist or other person authorised by regulation 38(1) operating or using irradiating apparatus registered for dental radiography; and

(b) a physiotherapist or chiropractor who refers a patient to a radiologist at approved premises for plain radiography of the spine, pelvic girdle, hip joints, sacro-iliac joints, chest, shoulder or extremities; and

(c) a podiatrist who refers a patient to a radiologist at approved premises for plain radiography of the foot or ankle; and

(d) a person operating or using irradiating apparatus in respect of which there is an exemption from registration under the Act; and

(e) a dentist who refers a patient to a radiologist at approved premises for plain radiography of the chest where the dentist believes that the patient may have inhaled or swallowed a foreign body during, or as a result of, dental treatment.

[Regulation 34 inserted: Gazette 11 Nov 1997 p. 6210-11; amended: Gazette 29 Feb 2000 p. 992; 25 Sep 2001 p. 5286.]

35. Information to be furnished by suppliers of certain irradiating apparatus

A supplier of irradiating apparatus for medical or veterinary fluoroscopy or radiography or chiropractic radiography shall, if that irradiating apparatus is new irradiating apparatus delivered to the operator or user thereof more than 12 months after the

date on which this regulation comes into operation in respect of that operator or user, provide that operator or user with —

(a) adequate instructions concerning any radiological safety procedures and precautions which may be necessary because of features unique to that irradiating apparatus; and

(b) a schedule showing the maintenance necessary to keep that irradiating apparatus in compliance with these regulations; and

(c) statements of the maximum rated peak tube potential, leakage technique factors, the minimum permanent filtration in the beam and the peak tube potential at which the filtration is obtained; and

(d) cooling curves for the x-ray tube anode and tube housing; and

(e) x-ray tube rating charts; and

(f) performance data, including performance data for image intensifier tubes.

36. Conditions on registration of irradiating apparatus

(1) Subject to section 36, the Council may, in registering any irradiating apparatus, impose in relation to that registration —

(a) the condition that the irradiating apparatus be provided with shielding to a specified standard and that specified safety devices be provided; and

(b) any one or more of the conditions specified in Schedule IX.

(2) Without limiting the operation of regulation 57, a person who contravenes the condition referred to in item 3(i) of Schedule IX is liable to a minimum penalty of $500.

[Regulation 36 amended: Gazette 11 Jun 1993 p. 2873.]

37. Conditions on registration of premises

(1) Subject to section 36, the Council may, in registering any premises in which any irradiating apparatus is or is to be operated or used, impose in relation to that registration the condition —

(a) that those premises or any specified part thereof be constructed in a specified manner and with specified materials, that specified safety devices be incorporated therein and that specified safety equipment be provided therein; and

(b) that the irradiating apparatus be of a specified type, be operated or used for a specified purpose and be of a specified maximum or minimum x-ray tube kilovoltage or milliamperage; and

(c) that the irradiating apparatus be operated or used only by persons having approved qualifications.

(2) The person in whose name premises referred to in subregulation (1) are registered shall ensure that those premises comply with the requirements set out in Schedule X in respect of the type of irradiating apparatus which is or is to be operated or used in those premises.

(3) The person in whose name any premises are registered for the purpose of industrial radiography shall ensure that industrial radiography is carried out only in those premises, unless the Council has by any condition imposed in relation to that registration permitted industrial radiography to be carried out on any other premises specified in that condition.

38. Restrictions on use of irradiating apparatus

(1) A person shall not use irradiating apparatus for dental radiography unless the person is —

(a) a dentist; or

(b) a radiographer acting on the instructions of a dentist or a medical practitioner; or

(c) a person with an approved dental ancillary qualification using the irradiating apparatus on the instructions of a dentist for —

(i) radiography of the teeth using an intra-oral image receptor, working under the general supervision of a dentist or a radiographer; or

(ii) lateral oblique radiography of the jaws, working under the general supervision of a dentist or radiographer; or

(iii) panoramic or cephalometric radiography, working under the personal supervision of a dentist or radiographer;

or

(d) a person training for qualifications as a dentist or radiographer, or enrolled in a course of training for an approved dental ancillary qualification, using the irradiating apparatus on the instructions of a dentist and working under the personal supervision of a dentist or a radiographer.

(2) A person shall not use irradiating apparatus for medical radiography unless the person is —

(a) a licensed radiologist; or

(b) a radiographer working under the direction and general supervision of a licensed radiologist; or

(c) a radiation therapist working under the direction and general supervision of a licensed radiation oncologist and using the apparatus for purposes related to the planning of therapeutic treatments for patients; or

(d) an x-ray operator, whose proficiency has been assessed by an approved radiographer within the previous 36 months, working under the direction and general supervision of a licensed medical practitioner and using low powered irradiating apparatus —

(i) for plain radiography of the chest, clavicle, scapula, shoulder, the upper extremity distal to the shoulder, the knee including the lower third of the femur, and lower extremity distal to the knee; or

(ii) for radiography, other than radiography described in subparagraph (i), that is performed outside the metropolitan region (as defined in *Planning and Development Act 2005* section 4), and is, in the opinion of the medical practitioner referring the patient, essential for the immediate medical care of the patient;

or

(e) a medical practitioner training for qualifications in diagnostic radiology working under the direction and general supervision of a licensed radiologist; or

(f) a person enrolled in a course of training in diagnostic radiography or radiation therapy that is recognized by the Australian Institute of Radiography and working under —

(i) the direction and general supervision of a licensed radiologist or a licensed radiation oncologist; and

(ii) the personal supervision of a radiographer or a radiation therapist.

(3) Notwithstanding subregulation (2), a person shall not use irradiating apparatus for mammography screening unless —

(a) the person is a radiographer who holds a Certificate of Clinical Proficiency in Mammography issued by the

Australian Institute of Radiography or can provide evidence of equivalent training or experience; and

(b) the person is working under the direction and general supervision of a licensed radiologist.

(4) Notwithstanding subregulation (2), a person shall not use irradiating apparatus for chest screening unless the person is a radiographer, or an x-ray operator, working under the direction and general supervision of a licensed medical practitioner.

(5) A person shall not use fluoroscopic irradiating apparatus on human beings unless the person is —

(a) a licensed radiologist or a licensed radiation oncologist; or

(b) a medical practitioner training for qualifications in diagnostic radiology or radiation oncology and working under the direction and general supervision of a licensed radiologist or licensed radiation oncologist; or

(ba) a licensed medical practitioner with specialist qualifications (other than a person to whom paragraph (a) or (b) applies) who is using the apparatus —

(i) for a purpose relevant to those qualifications; and

(ii) in the presence of a radiographer who has responsibility for positioning and manipulating the apparatus, minimizing patient and personnel radiation exposure and maintaining the records required by the conditions of the registration;

or

(bb) a medical practitioner training for specialist qualifications (other than a person to whom paragraph (b) applies) who —

(i) has attended an approved course of training and has passed an examination in radiation safety; and

(ii) is using the apparatus under the direction and general supervision of a licensed medical practitioner; and

(iii) is using the apparatus for a purpose relevant to those qualifications in the presence of a radiographer who has responsibility for positioning and manipulating the apparatus, minimizing patient and personnel radiation exposure and maintaining the records required by the conditions of the registration;

or

(c) a radiographer using the apparatus as part of a procedure while working under the direction and personal supervision of a licensed radiologist or a licensed radiation oncologist who is responsible for that procedure; or

(d) a radiographer or a radiation therapist using the apparatus as part of a procedure where —

(i) conventional radiography is inadequate; and

(ii) the licensed radiologist or licensed radiation oncologist responsible for that procedure has given permission for such use.

(6) A person shall not use irradiating apparatus for chiropractic radiography unless the person is —

(a) a licensed chiropractor; or

(b) a radiographer working under the direction and general supervision of a licensed chiropractor or a licensed radiologist.

(7) A person shall not use therapeutic irradiating apparatus for the treatment of human beings unless the person is —

(a) a licensed medical practitioner; or

(b) a radiation therapist working under the direction and general supervision of a licensed medical practitioner; or

(c) a medical practitioner training for qualifications in radiation oncology working under the direction and general supervision of a licensed radiation oncologist; or

(d) a person enrolled in a course of training for radiation therapy that is recognized by the Australian Institute of Radiography and working under the direction and general supervision of a licensed radiation oncologist and under the personal supervision of a radiation therapist.

(8) A person shall not use irradiating apparatus for veterinary radiography unless the person is —

(a) a licensed veterinarian; or

(b) a veterinarian working under the direction and personal supervision of a licensed veterinarian; or

(c) a radiographer working under the direction and general supervision of a licensed veterinarian; or

(d) a licensed radiographer acting on the instructions of a veterinarian; or

(e) a person training for qualifications as a veterinarian and working under the direction and personal supervision of a licensed veterinarian or under the personal supervision of a radiographer; or

(f) a person who holds or is training for qualifications in veterinary nursing practice recognized by the Council and is working under the direction and personal supervision of a licensed veterinarian.

(9) A person shall not use irradiating apparatus for veterinary fluoroscopy unless the person is —

(a) a licensed veterinarian; or

(b) a veterinarian training for qualifications in veterinary radiology and working under the general supervision of a licensed veterinarian or licensed radiologist; or

(c) a radiographer using the apparatus as part of a procedure under the direction and personal supervision of the licensed veterinarian responsible for that procedure.

(10) A person shall not use irradiating apparatus for the therapeutic treatment of animals unless the person is —

(a) a licensed veterinarian; or

(b) a licensed medical practitioner performing the treatment at the request of a veterinarian; or

(c) a veterinarian training for qualifications in veterinary radiotherapy and working under the direction and general supervision of a licensed veterinarian or licensed medical practitioner; or

(d) a radiation therapist performing the treatment at the request of a licensed veterinarian and working under the direction and general supervision of a licensed veterinarian or a licensed medical practitioner.

(11) A person shall not use irradiating apparatus for radiography or fluoroscopy on human remains unless the person is —

(a) a licensed radiologist; or

(b) a radiographer, or a mortuary or research worker who has attended an approved course of training, who —

(i) has the written approval of the registrant to perform approved procedures for researchers nominated by the registrant; and

(ii) is working under the direction and general supervision of a licensed medical practitioner.

(12) A person shall not use irradiating apparatus for radiography or fluoroscopy on animals for the purposes of research unless the person is —

(a) a licensed radiologist, a licensed veterinarian or a licensed research worker; or

(b) a radiographer, or a research worker who has attended an approved course of training, who —

(i) has the written approval of the registrant to perform approved procedures for researchers nominated by the registrant; and

(ii) is working under the direction and general supervision of a licensed radiologist, a licensed veterinarian or a licensed research worker.

(13) A person who is permitted by the Act and these regulations to operate or use irradiating apparatus shall do so in accordance with the requirements set out in Schedule XI.

[Regulation 38 inserted: Gazette 11 Nov 1997 p. 6211-4 (as amended: Gazette 10 Feb 1998 p. 733); amended: Gazette 10 Feb 1998 p. 733; 25 Sep 2001 p. 5286-7; 20 Sep 2016 p. 3968; SL 2022/93 r. 8.]

Part V — Electronic products

Division 1 — Microwave ovens

39. New microwave ovens to comply with microwave oven standard

A person shall not sell a microwave oven as a new microwave oven unless it complies with the requirements of the microwave oven standard.

[Regulation 39 inserted: Gazette 19 Aug 1997 p. 4721.]

40. Commercial microwave ovens to be tested

(1) The owner of a microwave oven which is used for purposes other than domestic or scientific purposes shall not operate or use it, or permit it to be operated or used, unless the oven has within the previous 3 years passed a compliance test.

(2) In subregulation (1) —

compliance test means a test, conducted in accordance with the test procedure, set out in item 32.1 of the microwave oven standard, to ensure that the oven complies with the radiation emission limit set out in that item.

[Regulation 40 inserted: Gazette 19 Aug 1997 p. 4721.]

*[**41-51.** Deleted: Gazette 19 Aug 1997 p. 4721.]*

Division 2 — Lasers

52. Terms used

(1) In this Division and in Schedules XIII and XIV, unless the contrary intention appears —

average output power means the total energy imparted during exposure divided by the duration of the exposure;

controlled area means controlled area within the meaning of subregulation (2);

laser system means functional assembly of electrical, mechanical and optical components which includes a laser;

regulated class 3B laser means —

(a) a class 3B laser with average output power greater than 5 milliwatts; or

(b) a single pulsed class 3B laser.

(2) For the purposes of this Division and of Schedules XIII and XIV, a controlled area is an area —

(a) in which the activities of persons are controlled and supervised for the purpose of protection from radiation hazards; and

(b) the extent of which is determined by the person in whose name the premises in which that area is situated are registered; and

(c) which is defined by approved screens or baffles having absorbing or diffusing reflecting surfaces.

[Regulation 52 amended: Gazette 10 Oct 1986 p. 3845; 15 Oct 1996 p. 5449.]

53. Lasers to be in compliance with laser safety standard

A person who manufactures, sells, uses or is in possession of a laser shall comply with the laser safety standard to the extent that the standard can be applied to the person in the circumstances.

[Regulation 53 inserted: Gazette 31 Dec 1999 p. 7062.]

53A. Regulations 54, 55 and 56 are in addition to regulation 53

The duties imposed on a person by regulations 54, 55 and 56 apply in addition to any duty imposed on that person by regulation 53.

[Regulation 53A inserted: Gazette 31 Dec 1999 p. 7062.]

53B. Laser pointers

(1) A person shall not manufacture, sell, use or possess a laser pointer unless —

(a) it is a class 1 or class 2 laser; or

(b) the Council has imposed a condition in relation to the registration of the laser under section 28 that it is to be used only for the purpose of entertainment.

(2) Despite subregulation (1), a person may use or possess a laser pointer if that person —

(a) is acting in the performance of his or her functions as a member of the Police Force, or a special constable appointed under Part III of the *Police Act 1892*; or

(b) is carrying out scientific research, scientific work or scientific observations, whether or not for remuneration; or

(c) is the lawful user of a firearm, as defined in the *Firearms Act 2024* section 6, and the laser pointer is part of a laser assisted sight for the firearm; or

(d) has the written approval of the Council to do so.

(3) Despite subregulation (1), a person may manufacture or sell a laser pointer if the person believes, on reasonable grounds, that the laser pointer is for the use of a person referred to in subregulation (2).

(4) In this regulation —

laser pointer means a laser for —

(a) pointing at objects or images; or

(b) recreation or amusement.

[Regulation 53B inserted: Gazette 31 Dec 1999 p. 7062; amended: Gazette 25 Sep 2001 p. 5287; SL 2024/297 r. 6.]

54. Regulated class 3B lasers

(1) The registrant of any premises in which a regulated class 3B laser is operated or used shall —

(a) require persons on those premises to follow such approved procedures; and

(b) give such directions,

as are necessary or desirable for preventing interbeam and intrabeam exposure to radiation of persons on those premises.

(2) A person —

(a) who is required to follow an approved procedure; or

(b) to whom a direction is given,

under subregulation (1) shall comply with that requirement or direction, as the case requires.

(3) The registrant of any premises in which a regulated class 3B laser is operated or used shall —

(a) affix to that laser or to the protective housing of its laser system labels in accordance with the requirements of the laser safety standard; and

(b) display —

(i) while the laser is being operated or used, warning signs in conspicuous locations inside and outside the area in which that operation or use is taking place and on doors giving access to that area; and

(ii) a warning sign in a prominent position near the laser,

in accordance with the requirements of the laser safety standard.

(4) The registrant of any premises in which a regulated class 3B laser is operated or used shall ensure that the requirements of Schedule XIII are complied with in relation to that laser.

[Regulation 54 inserted: Gazette 15 Oct 1996 p. 5449-50.]

55. Class 4 lasers

The registrant of any premises in which a class 4 laser is operated or used shall —

(a) comply with regulation 54(1), (2) and (3) as if the class 4 laser were a regulated class 3B laser; and

(b) ensure that the requirements of Schedule XIV are complied with in relation to that laser.

[Regulation 55 inserted: Gazette 15 Oct 1996 p. 5450.]

56. Requirements for enclosed lasers

(1) The registrant of any premises in which the totally enclosed laser system of a regulated class 3B laser or a class 4 laser is operated or used shall ensure that —

(a) the protective housing of that laser system limits the maximum accessible radiation to the maximum permissible exposure level specified in Tables 6 and 8 of the laser safety standard; and

(b) control measures applicable to the class of laser concerned are applied when its laser system is in normal operation; and

(c) persons who require access to that laser system for the purpose of servicing or maintaining it comply with the control measures and procedural requirements applicable to the class of laser concerned; and

(d) the laser or its laser system is provided with safety interlocks complying with Section 4.3 of the laser safety standard for any part of the protective housing the removal or displacement of which allows human access

to radiation in excess of the maximum permissible exposure level specified in Tables 6 and 8 of the laser safety standard.

(2) The registrant of any premises in which a regulated class 3B laser or a class 4 laser, which is itself enclosed, or the beam path of which is enclosed, by any covers, is operated or used shall, when the laser or its laser system is being operated or used with those covers removed for the purpose of servicing, maintenance, repair, testing or any other like procedure, ensure that —

(a) the laser is operated or used only within a temporary controlled area —

(i) defined by approved non-reflective screens or other means; and

(ii) provided with all safety measures required for persons working inside and outside it;

and

(b) the illuminance level at all working sites is not less than 350 lux.

[Regulation 56 inserted: Gazette 15 Oct 1996 p. 5450-1; amended: Gazette 17 Aug 2010 p. 4047.]

[Div. 3 (57A-57C) deleted: Gazette 9 Oct 2015 p. 3982.]

Part VI — General

57. Penalties

A person who commits an offence against these regulations by virtue of section 52 is liable on conviction —

(a) to a fine not exceeding $1 000; or

(b) if that offence is a continuing one, to a fine not exceeding $50 for every day or part of a day during which that offence is continued.

58. Fees

(1) An applicant for the registration or renewal of registration of any premises, other than premises used solely for the mining and milling of radioactive ores (including mineral sands), in which any radioactive substances are manufactured, used or stored must pay to the Council the appropriate fee set out in Schedule 15 Division 1 item 1 in respect of the maximum quantity of all radioactive substances in those premises at any one time.

(1aa) An applicant for the registration or renewal of registration of any premises used solely for the mining and milling of radioactive ores (including mineral sands) must pay to the Council the fee set out in Schedule 15 Division 1 item 2.

(1a) An applicant for the registration or renewal of registration of any premises in which any radioactive substances, irradiating apparatus or electronic products are sold or serviced must pay to the Council the fee set out in Schedule 15 Division 1 item 3.

(2) An applicant for the registration or renewal of registration of —

(a) any premises, other than premises referred to in subregulation (1), (1aa) or (1a); or

(b) any irradiating apparatus; or

(c) any electronic product,

must pay to the Council the appropriate fee, related to the number of units of irradiating apparatus or electronic products in those premises, set out in Schedule 15 Division 1 item 4.

(3) Subject to subregulation (5), an applicant for the grant or renewal of a licence must pay to the Council the appropriate fee set out in Schedule 15 Division 1 item 5.

(4) A person who is permitted to take a copy of records under section 50(3) must pay to the Council the fee set out in Schedule 15 Division 3 item 1.

(5) An applicant for the grant or renewal of a licence in respect of the testing of microwave ovens who is —

(a) an authorised officer as defined in the *Public Health Act 2016* section 4(2);

(b) an officer of the Health Department [3] of the Public Service of the State,

is hereby exempted from compliance with subregulation (3).

(5a) Notwithstanding subregulations (1), (1a), (2) or (3), where an applicant seeks to have —

(a) the registration of premises; or

(b) the renewal of registration of premises; or

(c) a licence; or

(d) the renewal of a licence,

granted for a period of more than one year but less than 2 years, the applicant must pay to the Council a *pro rata* fee (in addition

to the appropriate annual fee set out in Schedule 15 Division 1 in respect of that registration or licence) calculated as follows —

$$\frac{Adjustment^{1}}{52\,(week)} \quad x \quad \frac{Annual\ fee^{2}}{1} \quad = \quad Pro\text{-}rata\ fee^{3}$$

where —

1 is the number of weeks by which the term of the registration is to exceed 52 weeks; and

2 is the appropriate annual fee set out in Schedule 15 Division 1 in respect of the registration or licence for which the application is made; and

3 is the *pro rata* fee (where the *pro rata* fee is not a multiple of $1.00, the amount shall be rounded down to the nearest multiple of $1.00).

[(6) deleted]

(7) An applicant for the grant of a temporary permit in respect of any premises, other than premises used solely for the mining and milling of radioactive ores (including mineral sands), and radioactive substances must pay to the Council the appropriate fee set out in Schedule 15 Division 2 item 1 in respect of the maximum quantity of all radioactive substances in those premises at any one time.

(7a) An applicant for the grant of a temporary permit in respect of premises used solely for the mining and milling of radioactive ores (including mineral sands) must pay to the Council the fee set out in Schedule 15 Division 2 item 2.

(8) An applicant for the grant of a temporary permit in respect of any premises, other than premises referred to in subregulation (7) or (7a), irradiating apparatus or electronic product must pay to the Council the appropriate fee, related to the number of units (being irradiating apparatus or electronic products) in those premises, set out in Schedule 15 Division 2 item 3.

(9) An applicant for the grant of a temporary permit to operate, use, manufacture, store, transport, sell, possess, install, service, maintain repair, test or otherwise deal with any radioactive substance, irradiating apparatus or electronic product must pay to the Council the appropriate fee set out in Schedule 15 Division 2 item 4.

[Regulation 58 amended: Gazette 10 Oct 1986 p. 3846; 26 Jun 1987 p. 2461; 20 Oct 1989 p. 3842; 20 Jul 1990 p. 3465; 28 Jun 1991 p. 3148; 7 Aug 1992 p. 3857-8; 9 Jul 1993 p. 3331; 27 May 1994 p. 2212; 27 Jun 1995 p. 2547; 25 Aug 1995 p. 3847-8; 28 Jun 1996 p. 3021; 30 Jun 1999 p. 2875; 19 May 2015 p. 1754; 20 Sep 2016 p. 3968; 10 Jan 2017 p. 301; 14 Jun 2019 p. 1890; SL 2022/136 r. 20.]

59. Forms

(1) An applicant for a licence in respect of radioactive substances shall apply for that licence on form R.S. 1.

(2) An applicant for the renewal of a licence in respect of radioactive substances shall apply for that renewal on form R.S. 2.

(3) The Council shall, on granting a licence or a renewal of a licence in respect of radioactive substances, furnish the applicant for that licence or renewal with a licence on form R.S. 3.

(4) An applicant for a licence in respect of irradiating apparatus or electronic products shall apply for that licence on form R.S. 4.

(5) An applicant for the renewal of a licence in respect of irradiating apparatus or electronic products shall apply for that renewal on form R.S. 5.

(6) The Council shall, on granting a licence or a renewal of a licence in respect of irradiating apparatus or electronic products, furnish the applicant for that licence or renewal with a licence on form R.S. 6.

(7) An applicant for the registration of any premises in which any radioactive substance which is part of a gaseous self-luminous device is to be used or stored shall apply for that registration on form R.S. 7.

(8) An applicant for the renewal of a registration referred to in subregulation (7) shall apply for that renewal on form R.S. 8.

(9) A certificate referred to in section 28(6) which evidences the registration or renewal of registration of any premises in which any radioactive substance which is part of a gaseous self-luminous device is or is to be used or stored shall be on form R.S. 9.

(10) An applicant for the registration of any premises, including premises used solely for the mining and milling of radioactive ores (including mineral sands), in which any radioactive substance which is not part of a gaseous self-luminous device is to be manufactured, used or stored shall apply for that registration on form R.S. 10.

(11) An applicant for the renewal of a registration referred to in subregulation (10) shall apply for that renewal on form R.S. 11.

(12) A certificate referred to in section 28(6) which evidences the registration or renewal of registration of any premises in which any radioactive substance which is not part of a gaseous self-luminous device is or is to be manufactured, used or stored shall be on form R.S. 12.

(13) An applicant for the registration of any premises and any irradiating apparatus or electronic products to be used or operated therein shall apply for that registration on form R.S. 13.

(14) An applicant for the renewal of a registration referred to in subregulation (13) shall apply for that renewal on form R.S. 14.

(15) A certificate referred to in section 28(6) which evidences the registration or renewal of registration of any premises and any

irradiating apparatus or electronic products to be used or operated therein shall be on form R.S. 15.

(16) The Council shall, on granting a licence or renewal of licence in respect of radioactive substances or irradiating apparatus to a person who is or who is applying to be an industrial radiographer, furnish that person with a licence card on form R.S. 16.

(17) An applicant for a temporary permit shall apply for that temporary permit in writing.

(18) The Council shall, on granting a temporary permit, furnish the applicant with a temporary permit in such form as the Council may approve from time to time.

[Regulation 59 amended: Gazette 29 Nov 1991 p. 5990; 7 Aug 1992 p. 3858; 25 Aug 1995 p. 3848.]

[Pt. VII (r. 60) deleted: Gazette 9 Oct 2015 p. 3982.]

Schedule I

[Regulations 3 and 24]

Dose limits and maximum permissible exposure levels

1. (1) The dose limits for radiation workers are as follows —

(a) in any period of 5 years, an average effective dose of 20 millisieverts per year; and

(b) in any period of 12 months, an effective dose of 50 millisieverts; and

(c) in any period of less than 12 months but not less than one month, an effective dose of the amount which is the product of 50 millisieverts and the ratio of that period in weeks to 52 weeks; and

(d) in any period of less than one month, an effective dose of 1/12th of 50 millisieverts.

(2) The dose limits for a radiation worker who has notified her employer that she is pregnant are —

(a) for external radiation exposure, an equivalent dose to the surface of her abdomen for the remainder of her pregnancy of 2 millisieverts; and

(b) for internal radiation exposure, 1/20th of the Annual Limit on Intake (ALI) determined by reference to the values set out in the publication entitled "Dose Coefficients for Intakes of Radionuclides by Workers" being ICRP Publication 68 published for the International Commission on Radiological Protection.

(3) The dose limits for persons other than radiation workers are as follows —

(a) in any period of 5 years, an average effective dose of 1 millisievert per year; and

(b) in any period of 12 months, an effective dose of 5 millisieverts; and

(c) in respect of an area which such persons might continuously occupy —

(i) an effective dose of 20 microsieverts in any 1 hour; and

(ii) an effective dose of 250 microsieverts in any period of 7 days.

(4) The dose limit in a single planned special exposure referred to in regulation 24(2) is an effective dose of 100 millisieverts.

(5) For the purposes of determining the effective doses referred to in subitems (1), (3) and (4), an effective dose from x-rays or gamma rays shall be assumed to be the absorbed dose in air measured by a properly calibrated instrument or device at or near the surface of the body in the region of the highest anticipated exposure rate and multiplied by the modifying factors.

(6) If it is known that a part or parts only of the body has or have been exposed to ionising radiation, or that the body was not uniformly exposed, the effective dose for the person exposed may be determined from the equivalent doses received by the organs or tissues exposed.

2. (1) Persons occupationally or non-occupationally exposed to the following radiations shall not be exposed to —

(a) 50/60 Hz electric and magnetic fields which exceed the limits specified in the publication entitled "Interim Guidelines on Limits of Exposure to 50/60 Hz Electric and Magnetic Fields (1989)" published by the NHMRC in December 1989; or

(b) radiofrequency fields with frequencies from 3 kHz to 300 GHz which exceed the limits specified in the publication entitled "Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz" published by the Australian Radiation Protection and Nuclear Safety Agency in May 2002; or

(c) ultraviolet radiations with wavelengths from 180 nm to 400 nm which exceed the limits specified in the publication entitled "Occupational Standard for Exposure to Ultraviolet Radiation (1989)" published by the NHMRC in December 1989.

(2) Subitem (1)(b) does not apply to exposure resulting from the normal operation of microwave ovens which comply with the radiation emission limit set out in item 32.1 of the microwave oven standard.

[Schedule I amended: Gazette 4 May 1993 p. 2301; 28 Jan 1994 p. 283; 4 Mar 1994 p. 837; 17 Mar 1995 p. 1027; 22 Jul 1997 p. 3823-4; 19 Aug 1997 p. 4721; 17 Aug 2010 p. 4047-8.]

Schedule II

[Regulations 3, 10 and 59]

Forms

Radiation Safety Act 1975

Form RS 1

Application for licence in respect of radioactive substances

First Application

Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1. Name of Applicant.
2. Address:
3. Occupation:
4. Telephone No.:
5. Particulars of radioactive substances to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with by APPLICANT (maximum quantities to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with at any one time):

Sealed/unsealed	Isotope	Quantity and form

6. Purpose for which radioactive substances are to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with by APPLICANT:
7. Qualifications and experience of APPLICANT to use, manufacture, store, transport, sell, possess or otherwise deal with radioactive substances referred to in 5:

8. Location(s) at which it is intended to use, manufacture, store, transport, sell, possess or otherwise deal with radioactive substances referred to in 5:

.....

Signature of applicant

DATE .....

Form RS 2

Radiation Safety Act 1975

Form RS 2

Application for renewal of licence in respect of radioactive substances

Renewal Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:	
2.	Address:	
3.	Licence No.:	Expires:
4.	Occupation:	5. Telephone No.:

6. Give details of any changes in the particulars of radioactive substances to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with by APPLICANT (maximum quantities to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with at any one time) which changes have not previously been notified to and approved by the Council:

Sealed/unsealed	Isotope	Quantity and form

7. Give details of any changes in the location(s) of use, manufacture, storage, transport, sale or possession of or other dealing with radioactive substances and in the purpose for which radioactive substances are used, manufactured, stored, transported, sold, possessed or otherwise dealt with, which changes have not previously been notified to and approved by the Council:

.....
Signature of applicant

DATE .....

Form RS 3

Radiation Safety Act 1975

Form RS 3

Licence in respect of radioactive substances

A licence is hereby granted under the provisions of the *Radiation Safety Act 1975* to the person named below to use, manufacture, store, transport, sell, possess or otherwise deal with radioactive substances of the type and for the purpose designated below. The licence is subject to all applicable regulations under that Act and to any conditions, restrictions or limitations specified below or in any attachments hereto.

1.	Name of licensee:		
2.	Address:		
3.	Licence No.:	Licence expires:	Fee: $
4.	Occupation:	5. Telephone No.:	

6. Particulars of radioactive substances to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with by HOLDER (maximum quantities to be used, manufactured, stored, transported, sold, possessed or otherwise dealt with at any one time):

Sealed/unsealed	Isotope	Quantity and form

7. Conditions, restrictions or limitations:

8. Purpose of licence:

9. Location(s) of use, manufacture, storage, transport, sale, possession or other dealing with radioactive substances referred to in 6:

....

Date Chairman, Radiological Council

(This licence is not valid until it is signed by the Chairman, Radiological Council.)

Form RS 4

Radiation Safety Act 1975

Form RS 4

Application for licence in respect of irradiating apparatus or electronic products

First Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:	
2.	Address:	
3.	Occupation:	4. Telephone No.:
5.	Type of irradiating apparatus or electronic product to be operated, used, manufactured, stored, transported, sold, possessed, installed, serviced, maintained, repaired, tested or otherwise dealt with by APPLICANT:	
6.	Purpose for which irradiating apparatus or electronic products to be operated, used, manufactured, stored, transported, sold, possessed, installed, serviced, maintained, repaired, tested or otherwise dealt with by APPLICANT:	
7.	Qualifications and experience of APPLICANT to operate, use, manufacture, store, transport, sell, possess, install, service, maintain, repair, test or otherwise deal with irradiating apparatus or electronic products of type referred to in 5:	
8.	Location(s) at which it is intended to operate, use, manufacture, store, transport, sell, possess, install, service, maintain, repair, test or otherwise deal with irradiating apparatus or electronic products referred to in 5:	

.....
Signature of applicant

DATE .....

Form RS 5

Radiation Safety Act 1975

Form RS 5

Application for renewal of licence in respect of irradiating apparatus or electronic products

Renewal Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:	
2.	Address:	
3.	Licence No.:	Expires:
4.	Occupation:	5. Telephone No.:
6.	Give details of any changes in type of irradiating apparatus or electronic products to be operated, used, manufactured, stored, transported, sold, possessed, installed, serviced, maintained, repaired, tested or otherwise dealt with, which changes have not previously been notified to and approved by the Council:	
7.	Give details of any changes in location(s) of operation, use, manufacture, storage, transport, sale, possession, installation, service, maintenance, repair, testing or other dealing with irradiating apparatus or electronic products and in the purpose for which irradiating apparatus or electronic products are to be operated, used, manufactured, stored, transported, sold, possessed, installed, serviced, maintained, repaired or otherwise dealt with, which changes have not previously been notified to and approved by the Council:	

.....
Signature of applicant

DATE .....

Radiation Safety Act 1975

Form RS 6

Licence in respect of irradiating apparatus or electronic products

A licence is hereby granted under the *Radiation Safety Act 1975* to the person named below to operate, use, manufacture, store, transport, sell, possess, install, service, maintain, repair, test or otherwise deal with irradiating apparatus and electronic products of the types and for the purpose designated below. The licence is subject to all applicable regulations under that Act and to any conditions, restrictions or limitations specified below or in any attachments hereto.

1.	Name of licensee:		
2.	Address:		
3.	Licence No.:	Licence expires:	Fee: $
4.	Occupation:	5. Telephone No.:	
6.	Types of irradiating apparatus or electronic products:		
7.	Conditions, restrictions or limitations:		
8.	Purpose of licence:		
9.	Location(s) of operation, use, manufacture, storage, transport, sale, possession, installation, service, maintenance, repair, testing or other dealing with irradiating apparatus or electronic products referred to in 6:		

....

Date Chairman, Radiological Council

(This licence is not valid until it is signed by the Chairman, Radiological Council.)

Form RS 7

Radiation Safety Act 1975

Form RS 7

Application for registration of premises in which radioactive substances (in gaseous self luminous devices) are to be used or stored

First Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:		
2.	Address:		
3.	Occupation:	4.	Telephone No.:

5. Particulars of GASEOUS SELF LUMINOUS DEVICES:

Number	Make and type	Purpose or wording	Location*

6. Particulars and location of premises subject of application:

7. Name and position of person responsible for gaseous self luminous devices at premises referred to in 6:

8. Name of architect, builder, electrician, contractor, etc. responsible for installation of gaseous self luminous devices:

I/We hereby apply for registration under section 28 of the *Radiation Safety Act 1975* in respect of the premises referred to in 6 for the use or storage of radioactive substances (in gaseous self luminous devices) therein.

DATE ..... Signature of ..... applicant

* A plan or sketch must be provided which enables the gaseous self luminous devices in the building to be located. It should show the address or locality of the building, the location of the building with respect to other buildings in a complex, the orientation of the building with respect to access ways, and the location of those devices in the building (show whether ground, first, second or other floor).

NOTE: An application for registration must be made by the owner of the premises. As defined in the *Radiation Safety Act 1975*, ***owner*** includes hirer, lessee, borrower, bailee or mortgagee in possession and any attorney, agent, manager, foreman, supervisor or other person in charge or having control or management and any person acting or representing himself to be acting for an owner. The attention of applicants is drawn to the responsibilities of the person in whose name the premises are registered as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

On completion, this form and accompanying plans or sketches should be sent to:

Radiological Council,
Box C134, G.P.O.,
PERTH, W.A. 6001.

Form RS 8

Radiation Safety Act 1975

Form RS 8

Application for renewal of registration of premises in which radioactive substances (in gaseous self luminous devices) are used or stored

Renewal Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:	
2.	Address:	
3.	Registered No.:	Registration expires:
4.	Occupation:	5. Telephone No.:

6. Particulars of GASEOUS SELF LUMINOUS DEVICES:

Number	Make and type	Purpose or wording	Location*

7. Give details of any changes in particulars of premises subject of application:

8. Name and position of person responsible for gaseous self luminous devices at premises referred to in 7:

I/We hereby apply for renewal of the registration held under the *Radiation Safety Act 1975* in respect of the premises described above for the use or storage of radioactive substances (in gaseous self luminous devices) therein.

DATE ..... Signature of ..... applicant

* If space is insufficient for any item, attach supplementary notes signed by the applicant.

Form RS 8

NOTE: An application for renewal of registration must be made by the person in whose name the premises concerned are registered. The attention of applicants is drawn to the responsibilities of the person in whose name the premises are registered as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

Form RS 9

Radiation Safety Act 1975

Form RS 9

Certificate of registration of premises in which radioactive substances (in gaseous self luminous devices) are or are to be used or stored

It is hereby certified that the premises referred to below have been registered under the *Radiation Safety Act 1975* for the use or storage of the radioactive substances (in gaseous self luminous devices) listed below. The registration is subject to all applicable regulations under that Act and to any conditions, restrictions or limitations specified below or in any attachments hereto.

1. Name of owner of premises:		
2. Address:		
3. Registration No.:	Registration expires:	Fee: $
4. Occupation:	5. Telephone No.:	

6. Particulars of GASEOUS SELF LUMINOUS DEVICES:

Number	Make and type	Purpose or wording	Location*

7. Particulars and location of premises subject of registration:

8. Name and position of person responsible for the gaseous self luminous devices at premises referred to in 7:

DATE ....
Signature of person in whose name premises are registered.

DATE ....
Secretary, Radiological Council

(This registration is not valid until it is signed by the Secretary, Radiological Council.)

* If space is insufficient for any item, attach supplementary lists.

Form RS 9

NOTE: As defined in the *Radiation Safety Act 1975*, ***owner*** includes hirer, lessee, borrower, bailee or mortgagee in possession and any attorney, agent, manager, foreman, supervisor or other person in charge or having control or management and any person acting or representing himself to be acting for an owner.

Form RS 10

Radiation Safety Act 1975

Form RS 10

Application for registration of premises in which radioactive substances (not in gaseous self luminous devices) are to be manufactured, used or stored

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

First Application
Fee: $ .....

1. Name of applicant:
2. Address:
3. Telephone No:
4. Occupation, nature of business, etc.:
5. Name and title of applicant for correspondence:
6. PARTICULARS OF RADIOACTIVE SUBSTANCES TO BE MANUFACTURED, USED OR STORED ON PREMISES:

Sealed/unsealed	Isotope	Quantity and form*	Location of manufacture, use or storage

* State maximum quantity to be on premises at any one time.

7. If regular use or storage is to be made of radioactive substances, state quantity in each shipment and frequency of arrival of shipments:
8. Locations where radioactive substances are to be manufactured, used or stored:
9. Purpose for which radioactive substances are to be manufactured, used or stored:
10. Protective equipment and handling techniques proposed:
11. Location and construction of storage facilities:
12. Nature and proposed method of disposal of radioactive waste:
13. Proposed manner of disposal of sealed sources no longer required:

14.	Names, positions, qualifications and experience of persons who will manufacture or use the radioactive substances for radiation work (including persons holding licences under the *Radiation Safety Act 1975*):
15.	Name, qualifications and experience of radiation safety officer:
16.	Monitoring instruments:
17.	Arrangements made for personnel monitoring:
DATE	..... Signature of applicant.

NOTE: An application for registration must be made by the owner of the premises where the radioactive substances are to be manufactured, used or stored. As defined in the *Radiation Safety Act 1975*, ***owner*** includes hirer, lessee, borrower, bailee or mortgagee in possession and any attorney, agent, manager, foreman, supervisor or other person in charge or having control or management and any person acting or representing himself to be acting for an owner. The attention of applicants is drawn to the responsibilities of the person in whose name the premises are registered as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

Form RS 11

Radiation Safety Act 1975

Form RS 11

Application for renewal of registration of premises in which radioactive substances (not in gaseous self luminous devices) are manufactured, used or stored

Renewal Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.
PERTH, W.A. 6001.

1.	Name of Applicant:	
2.	Address:	
3.	Registration No.:	Registration expires:
4.	Occupation:	5. Telephone No.:
6.	Name and title of representative of applicant for correspondence:	
7.	PARTICULARS OF RADIOACTIVE SUBSTANCES* MANUFACTURED, USED OR STORED IN PREMISES:	

Type of source (Sealed/unsealed)	Radioactive substance	Quantity and form	Purpose	Location on premises

8.	Place of manufacture, use or storage (if this differs from address in 2):
9.	Names and qualifications of persons* manufacturing or using radioactive substances for radiation work (including persons holding licences under the *Radiation Safety Act 1975*):
10.	Name of radiation safety officer:
11.	Have any changes been made in the premises, facilities or procedures for manufacture, use or storage of radioactive substances which have not been notified to and approved by the Council? If so, give details.

DATE ....
Signature of applicant.

Form RS 11

* If space is insufficient for any item, attach supplementary lists signed by the applicant.

NOTE: An application for renewal of registration must be made by the person in whose name the premises are registered. The attention of applicants is drawn to the responsibilities of that person as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

Form RS 12

Radiation Safety Act 1975

Form RS 12

Certificate of registration of premises in which radioactive substances (not in gaseous self luminous devices) are or are to be manufactured, used or stored

It is hereby certified that the premises referred to below have been registered under the *Radiation Safety Act 1975* for the manufacture, use, storage or other dealing in radioactive substances. The registration is subject to all applicable regulations under that Act and to any conditions, restrictions or limitations specified below or in any attachments hereto.

1.	Name of owner of premises:		
2.	Address:		
3.	Occupation:	4. Telephone No.:	
5.	Registration No.:	Registration expires:	Fee: $

6. PARTICULARS OF RADIOACTIVE SUBSTANCES TO BE MANUFACTURED, USED OR STORED IN PREMISES:

Sealed/unsealed	Isotope	Quantity and form*	Location of manufacture, use or storage

* State maximum quantity to be on premises at any one time.

7. Particulars and location of premises subject of registration:

8. Purpose for which radioactive substances are to be manufactured, used or stored:

9. Name of radiation safety officer:

10. Names of persons licensed or otherwise authorised to use radioactive substances in the premises:

Form RS 12

11. Conditions, restrictions, or limitations:	
.....	.....
Date	Secretary, Radiological Council

(This certificate is not valid until it has been signed by the Secretary, Radiological Council.)

NOTE: As defined in the *Radiation Safety Act 1975*, ***owner*** includes hirer, lessee, borrower, bailee or mortgagee in possession and any other attorney, agent, manager, foreman, supervisor or other person in charge or having control or management and any person acting or representing himself to be acting for an owner.

Form RS 13

Radiation Safety Act 1975

Form RS 13

Application for registration of premises and irradiating apparatus/electronic products to be operated or used therein

First Application
Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.,
PERTH, W.A. 6001.

1. Name of applicant:
2. Address:
3. Telephone No.:
4. Occupation, nature of business, etc.:
5. Name and title of representative of applicant for correspondence:
6. PARTICULARS OF IRRADIATING APPARATUS OR ELECTRONIC PRODUCTS* TO BE OPERATED OR USED IN THE PREMISES:

Number	Maker and type	Type of radiation**	Purpose	Location on premises

7. Location of premises to be registered:
8. Radiation protection provision i.e. structural, fixed and movable screens, safety devices, etc.:
9. Names, positions, qualifications and experience * of persons to operate or use the irradiating apparatus/electronic products for radiation work (other than licence holders under the *Radiation Safety Act 1975*):
10. Names of persons licensed to operate or use irradiating apparatus/electronic products:
11. Name, qualifications and experience of radiation safety officer:

12. Monitoring instruments available on premises:

13. Arrangements made for personnel monitoring:

DATE ....
Signature of applicant.

* If space is insufficient for any item, attach supplementary lists signed by the applicant.

* * If irradiating apparatus, enter maximum kilovolts and milliamps: if electronic products, describe the radiation by its common name and give wavelength or frequency, if known.

NOTE: An application for registration must be made by the owner of the premises, irradiating apparatus or electronic products. As defined in the *Radiation Safety Act 1975*, ***owner*** includes hirer, lessee, borrower, bailee or mortgagee in possession and any attorney, agent, manager, foreman, supervisor or other person in charge or having control or management and any person acting or representing himself to be acting for an owner. The attention of applicants is drawn to the responsibilities of the person in whose name the premises, irradiating apparatus or electronic products are registered as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

Form RS 14

Radiation Safety Act 1975

Form RS 14

Application for renewal of registration of premises and irradiating apparatus/electronic products operated or used therein

Renewal Application Fee: $ .....

TO: The RADIOLOGICAL COUNCIL,
Box C134, G.P.O.,
PERTH, W.A. 6001.

1.	Name of applicant:	
2.	Address:	
3.	Registration No:	Registration expires:
4.	Occupation:	5. Telephone No.:
6.	Name and title of representative of applicant for correspondence:	
7.	PARTICULARS OF IRRADIATING APPARATUS OR ELECTRONIC PRODUCTS OPERATED OR USED IN THE PREMISES:	

Number	Maker and type	Type of radiation**	Purpose	Location on premises

8.	Location of use or operation:
9.	Names, positions, qualifications and experience* of persons operating or using the irradiating apparatus/electronic products for radiation work (other than licence holders under the *Radiation Safety Act 1975*):
10.	Names of persons licensed to operate or use irradiating apparatus/electronic products:
11.	Name of radiation safety officer:
12.	Have any changes been made in the premises, irradiating apparatus or electronic products which have not been notified to and approved by the Council? If so, give details:

Form RS 14

DATE ....
Signature of applicant.

* If space is insufficient for any item, attach supplementary lists signed by the applicant.

* * If irradiating apparatus, enter maximum kilovolts and milliamps: if electronic products, describe the radiation by its common name and give wavelength or frequency, if known.

NOTE: An application for renewal of registration must be made by the person in whose name the premises, irradiating apparatus or electronic products are registered. The attention of applicants is drawn to the responsibilities of that person as set out in the *Radiation Safety Act 1975* and the *Radiation Safety (General) Regulations 1983*.

Form RS 15

Radiation Safety Act 1975

Form RS 15

Certificate of registration of premises and irradiating apparatus/electronic products operated or used therein

It is hereby certified that the premises, irradiating apparatus or electronic products referred to hereunder have been registered under the *Radiation Safety Act 1975*. The registration is subject to all applicable regulations under that Act and to any conditions, restrictions or limitations specified below or in any attachments hereto.

1.	Name of owner of premises, irradiating apparatus or electronic products*:		
2.	Address:		
3.	Occupation:	4. Telephone No.:	
5.	Registration No.:	Registration expires:	Fee: $
6.	Particulars and location of premises subject of registration:		

7. PARTICULARS OF IRRADIATING APPARATUS OR ELECTRONIC PRODUCTS OPERATED OR USED IN PREMISES:

Number	Maker and type	Type of radiation	Purpose	Location on premises

8. Name of radiation safety officer:

9. Names of persons licensed or otherwise authorised to operate or use the irradiating apparatus or electronic products in the premises:

10. Conditions, restrictions or limitations:

....

Date Secretary, Radiological Council

(This certificate is not valid until it has been signed by the Secretary of the Radiological Council.)

Form RS 15

* As defined in the *Radiation Safety Act 1975*, the ***owner*** of the premises, irradiating apparatus or electronic products, includes hirer, lessee, borrower, bailee or mortgagee in possession and any attorney, agent, manager, foreman, supervisor, or other person in charge or having control or management and any person acting or representing himself to be acting for an owner.

Form RS 16

Form RS 16

Radiation Safety Act 1975

_____ holds a licence under the Act for the use of

RADIOACTIVE SUBSTANCES (LS /)

IRRADIATING APPARATUS (LX /)

(Delete whichever is not applicable)

for the purpose of INDUSTRIAL RADIOGRAPHY

_____

Licences held under the *Radiation Safety Act 1975* are subject to all applicable regulations under the Act and to any conditions, restrictions or limitations imposed when the licence was issued.

Activity Limits

Expiry date

..... Chairman,
Radiological Council.
(not valid until signed)

[Schedule II amended: Gazette 29 Nov 1991 p. 5990.]

Schedule III — Exemption Label

[Regulations 7C(3) and 7D(3)]

Caution — Radioactive



[Name of device]

[Radionuclide]

[Activity of radioactive substance]

[Date activity was measured]

Warning

It is an offence to dispose of this device other than in accordance with a disposal permit granted under section 34 of the *Radiation Safety Act 1975*.

Radiological Council
Locked Bag 2006 PO
Nedlands WA 6009
Telephone: (08) 9346 2260
Fax: (08) 9381 1423
Email: radiation.health@health.wa.gov.au

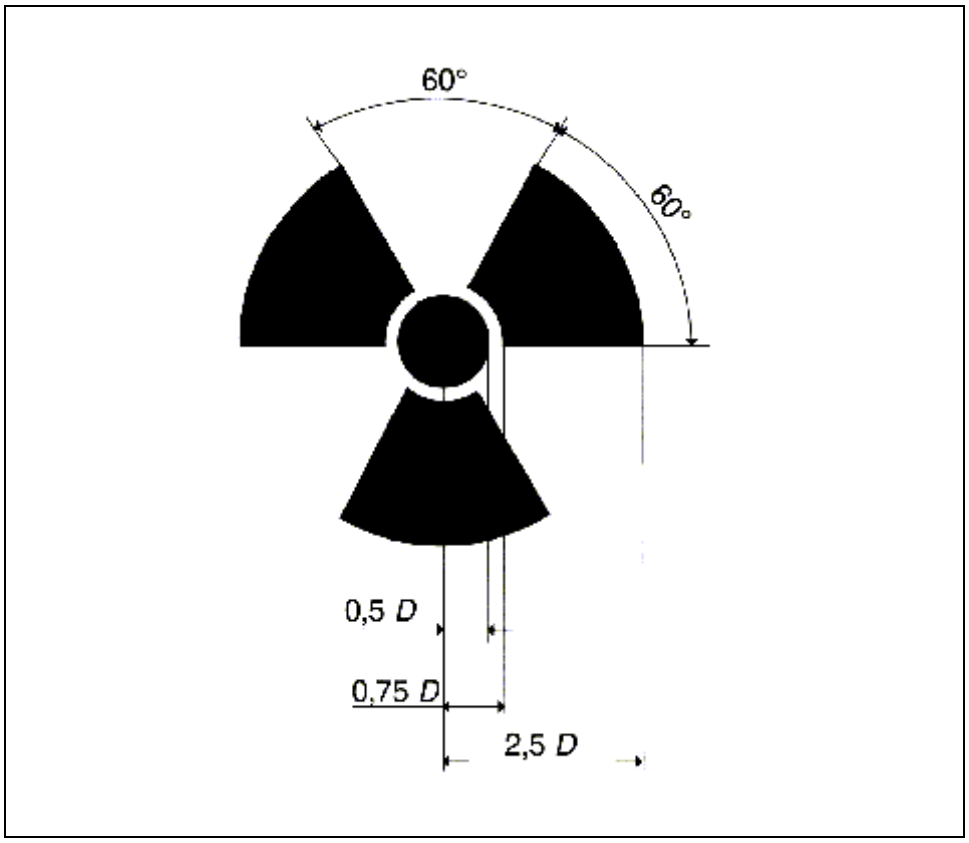
[Schedule III inserted: Gazette 31 Dec 1999 p. 7063.]

Schedule IV

[Regulations 3, 7A(2)(c), 22, 29 and 30]

Radiation warning symbol

The radiation warning symbol consists of the conventional three-blade design shown below and uses the conventional radiation caution colours, that is to say, magenta, purple or black in the dark area and yellow in the background.



[Schedule IV amended: Gazette 6 Sep 1991 p. 4631; 22 Jul 1997 p. 3824.]

Schedule V

[Regulations 5, 16, 30, 31 and 32]

Exempt quantities of radioactive substances

Item	Radioactive substance	Maximum quantity (megabecquerels)
1	Americium 241	0.0004
2	Antimony 122	4.0
3	Antimony 124	0.4
4	Antimony 125	0.4
5	Arsenic 73	4.0
6	Arsenic 74	0.4
7	Arsenic 76	0.4
8	Arsenic 77	4.0
9	Barium 131	0.4
10	Barium 133	0.4
11	Barium 140	0.4
12	Bismuth 210	0.04
13	Bromine 82	0.4
14	Cadmium 109	0.4
15	Cadmium 115m	0.4
16	Cadmium 115	4.0
17	Caesium 131	40.0
18	Caesium 134m	4.0
19	Caesium 134	0.04
20	Caesium 135	0.4
21	Caesium 136	0.4
22	Caesium 137	0.4
23	Calcium 45	0.4
24	Calcium 47	0.4
25	Carbon 14	4.0
26	Cerium 141	4.0
27	Cerium 143	4.0
28	Cerium 144	0.04
29	Chlorine 36	0.4
30	Chlorine 38	0.4
31	Chromium 51	40.0
32	Cobalt 58m	0.4
33	Cobalt 58	0.4
34	Cobalt 60	0.04
35	Copper 64	4.0
36	Dysprosium 165	0.4
37	Dysprosium 166	4.0
38	Erbium 169	4.0
39	Erbium 171	4.0
40	Europium 152(9.2h)	4.0
41	Europium 152(13 yr.)	0.04
42	Europium 154	0.04
43	Europium 155	0.4
44	Fluorine 18	40.0
45	Gadolinium 153	0.4
46	Gadolinium 159	4.0
47	Gallium 72	0.4
48	Germanium 71	4.0
49	Gold 198	4.0
50	Gold 199	4.0
51	Hafnium 181	0.4
52	Holmium 166	4.0
53	Hydrogen 3	40.0

Item	Radioactive substance	Maximum quantity (megabecquerels)
54	Indium 113m	4.0
55	Indium 114m	0.4
56	Indium 115m	4.0
57	Indium 115	0.4
58	Iodine 125	0.04
59	Iodine 126	0.04
60	Iodine 129	0.004
61	Iodine 131	0.04
62	Iodine 132	0.4
63	Iodine 133	0.04
64	Iodine 134	0.4
65	Iodine 135	0.4
66	Iridium 192	0.4
67	Iridium 194	4.0
68	Iron 55	4.0
69	Iron 59	0.4
70	Krypton 85	4.0
71	Krypton 87	0.4
72	Lanthanum 140	0.4
73	Lutetium 177	4.0
74	Manganese 52	0.4
75	Manganese 54	0.4
76	Manganese 56	0.4
77	Mercury 197m	4.0
78	Mercury 197	4.0
79	Mercury 203	0.4
80	Molybdenum 99	4.0
81	Neodymium 147	4.0
82	Neodymium 149	4.0
83	Nickel 59	4.0
84	Nickel 63	0.4
85	Nickel 65	4.0
86	Niobium 93m	0.4
87	Niobium 95	0.4
88	Niobium 97	0.4
89	Osmium 185	0.4
90	Osmium 191m	4.0
91	Osmium 191	4.0
92	Osmium 193	4.0
93	Palladium 103	4.0
94	Palladium 109	4.0
95	Phosphorus 32	0.4
96	Platinum 191	4.0
97	Platinum 193m	4.0
98	Platinum 193	4.0
99	Platinum 197m	4.0
100	Platinum 197	4.0
101	Plutonium 239	0.0004
102	Polonium 210	0.004
103	Potassium 42	0.4
104	Praseodymium 142	4.0
105	Praseodymium 143	4.0
106	Promethium 147	0.4
107	Promethium 149	0.4
108	Radium 226	0.0004
109	Rhenium 186	4.0
110	Rhenium 188	4.0
111	Rhodium 103m	4.0
112	Rhodium 105	4.0
113	Rubidium 86	0.4
114	Rubidium 87	0.4

Item	Radioactive substance	Maximum quantity (megabecquerels)
115	Ruthenium 97	4.0
116	Ruthenium 103	0.4
117	Ruthenium 105	0.4
118	Ruthenium 106	0.04
119	Samarium 151	0.4
120	Samarium 153	4.0
121	Scandium 46	0.4
122	Scandium 47	4.0
123	Scandium 48	0.4
124	Selenium 75	0.4
125	Silicon 31	4.0
126	Silver 105	0.4
127	Silver 110m	0.04
128	Silver 111	4.0
129	Sodium 22	0.4
130	Sodium 24	0.4
131	Strontium 85	0.4
132	Strontium 89	0.04
133	Strontium 90	0.004
134	Strontium 91	0.4
135	Strontium 92	0.4
136	Sulphur 35	4.0
137	Tantalum 182	0.4
138	Technetium 96	0.4
139	Technetium 97m	4.0
140	Technetium 97	4.0
141	Technetium 99m	4.0
142	Technetium 99	0.4
143	Tellurium 125m	0.4
144	Tellurium 127m	0.4
145	Tellurium 127	4.0
146	Tellurium 129m	0.4
147	Tellurium 129	4.0
148	Tellurium 131m	0.4
149	Tellurium 132	0.4
150	Terbium 160	0.4
151	Thallium 200	4.0
152	Thallium 201	4.0
153	Thallium 202	4.0
154	Thallium 204	0.4
155	Thorium (natural)[1]	4.0
156	Thulium 170	0.4
157	Thulium 171	0.4
158	Tin 113	0.4
159	Tin 125	0.4
160	Tungsten 181	0.4
161	Tungsten 185	0.4
162	Tungsten 187	4.0
163	Uranium (natural)[2]	4.0
164	Uranium 233	0.0004
165	Uranium 235	0.0004
166	Vanadium 48	0.4
167	Xenon 131m	40.0
168	Xenon 133	4.0
169	Xenon 135	4.0
170	Ytterbium 175	4.0
171	Yttrium 90	0.4
172	Yttrium 91	0.4
173	Yttrium 92	4.0
174	Yttrium 93	4.0
175	Zinc 65	0.4

Item	Radioactive substance	Maximum quantity (megabecquerels)
176	Zinc 69m	4.0
177	Zinc 69	40.0
178	Zirconium 93	0.4
179	Zirconium 95	0.4
180	Zirconium 97	0.4
	Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.0004
	Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	0.004

(See notes at end of this Schedule and Appendix thereto)

[1] Based on alpha disintegration rate of Th-232, Th-230 and their daughter products.
[2] Based on alpha disintegration rate of U-238, U-234, and U-235.

NOTE: For purposes of regulations 5(1)(b) and 32(3), where there is involved a combination of isotopes in known amounts, the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i.e. "unity"). *Example*: for purposes of regulation 5(1)(b), if a particular combination contains 1 megabecquerel of Au-198 and 2 megabecquerels of C-14, it may also include not more than 0.01 megabecquerel of I-131. This limit was determined as follows:

$$\frac{1\ megabecquerel\ Au\text{-}198}{4\ megabecquerels} + \frac{2\ megabecquerels\ C\text{-}14}{4\ megabecquerels} + \frac{0.01\ megabecquerel\ I\text{-}131}{0.04\ megabecquerel}$$

$$= 0.25 + 0.5 + 0.25 = 1$$

[Schedule V amended: Gazette 22 Jul 1997 p. 3824.]

Schedule VI

[Regulation 5]

Exempt quantities of radioactive substances in certain timekeeping and other devices

Table 1. Wrist watches

Radioactive substance	*Maximum quantity*
^{3}H	1 gigabecquerel
^{147}Pm	5.5 megabecquerels
^{226}Ra	5.5 kilobecquerels

Table 2. Pocket watches

Radioactive substance	*Maximum quantity*
^{3}H	1 gigabecquerel
^{147}Pm	5.5 megabecquerels

Table 3. Clocks

Radioactive substance	*Maximum quantity*
^{3}H	1 gigabecquerel
^{147}Pm	7.4 megabecquerels
^{226}Ra	7.4 kilobecquerels

Table 4. Special timepieces

Radioactive substance	*Maximum quantity*
^{3}H	1 gigabecquerel
^{147}Pm	18 megabecquerels
^{226}Ra	0.055 megabecquerel

NOTE: Special timepieces are timepieces, usually worn by an individual, containing quantities of radioactive material to produce luminosity necessary for special purposes.

Table 5. Other devices

Radioactive substance	*Maximum quantity*
^{3}H	1 gigabecquerel
^{147}Pm	18 megabecquerels
^{226}Ra	5.5 kilobecquerels

[Schedule VI amended: Gazette 16 Jul 2002 p. 3400.]

Schedule VII — Exempted electronic products

[Regulation 7]

Item	*Electronic product*	*Regulations from which there is no exemption under section 6 and regulation 7*
1	Microwave ovens	regulations 39 and 40
2	Class 1 lasers	regulation 53
3	Class 2 lasers	regulation 53
[4, 5 deleted]		
6	Class 3B lasers with average output power of 5 milliwatts or less, other than single pulsed lasers	regulations 53 and 53B
7	Class 3R lasers	regulations 53 and 53B

[Schedule VII inserted: Gazette 31 Dec 1999 p. 7064; amended: Gazette 17 Aug 2010 p. 4048.]

Schedule VIIA

[Regulation 7A]

Exempted self luminous devices

Model	Type
Permluco self powered sign	FO 1
Permluco self powered sign	FO 3
Permluco self powered sign	FO 4
Permluco self powered sign	FO 9.

[Schedule VIIA inserted: Gazette 6 Sep 1991 p. 4632.]

Schedule VIII

[Regulations 15, 30, 31 and 33]

Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
Actinium (89)	Ac-227	S	7.4×10^{-2}	$2.2 \times 10^{+6}$	3×10^{-3}	$7.4 \times 10^{+4}$
		I	1.1×10^{-0}	$3.3 \times 10^{+8}$	3.3×10^{-2}	$1.1 \times 10^{+7}$
	Ac-228	S	$3 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.1 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$7.4 \times 10^{+2}$	$1.1 \times 10^{+8}$	$2.2 \times 10^{+1}$	$3.3 \times 10^{+6}$
Americium (95)	Am-241	S	2.2×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	Am-242m	S	2.2×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$
		I	$1.1 \times 10^{+1}$	$1.1 \times 10^{+8}$	3.3×10^{-1}	$3.3 \times 10^{+6}$
	Am-242	S	$1.5 \times 10^{+3}$	$1.5 \times 10^{+8}$	$3.7 \times 10^{+1}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+3}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+1}$	$3.7 \times 10^{+6}$
	Am-243	S	2.2×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$1.7 \times 10^{+6}$
	Am-244	S	$1.5 \times 10^{+5}$	$3.7 \times 10^{+9}$	$3.7 \times 10^{+3}$	$1.8 \times 10^{+8}$
		I	$7.4 \times 10^{+6}$	$3.7 \times 10^{+9}$	$3 \times 10^{+4}$	$1.8 \times 10^{+8}$
Antimony (51)	Sb-122	S	$7.4 \times 10^{+3}$	$3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
	Sb-124	S	$7.4 \times 10^{+3}$	$2.6 \times 10^{+7}$	$1.8 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$7.4 \times 10^{+2}$	$2.6 \times 10^{+7}$	$2.6 \times 10^{+1}$	$7.4 \times 10^{+5}$
	Sb-125	S	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$1.1 \times 10^{+8}$	$3.3 \times 10^{+1}$	$3.7 \times 10^{+6}$
Argon (18)	Ar-37	Sub[2]	$2.2 \times 10^{+8}$	—	$3.7 \times 10^{+6}$	—
	Ar-41	Sub	$7.4 \times 10^{+4}$	—	$1.5 \times 10^{+3}$	—
Arsenic (33)	As-73	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.8 \times 10^{+7}$
		I	$1.5 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3.7 \times 10^{+2}$	$1.8 \times 10^{+7}$
	As-74	S	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.8 \times 10^{+4}$
		I	$3.7 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.5 \times 10^{+2}$	$1.8 \times 10^{+4}$
	As-76	S	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.5 \times 10^{+2}$	$1.8 \times 10^{+5}$
		I	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.1 \times 10^{+2}$	$1.8 \times 10^{+5}$
	As-77	S	$1.8 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$3 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3 \times 10^{+6}$
Astatine (85)	At-211	S	$2.6 \times 10^{+2}$	$1.8 \times 10^{+6}$	7.4×10^{-0}	$7.4 \times 10^{+4}$
		I	$1.1 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+1}$	$2.6 \times 10^{+6}$
Barium (56)	Ba-131	S	$3.7 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$1.8 \times 10^{+8}$	$3.7 \times 10^{+2}$	$7.4 \times 10^{+6}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
	Ba-140	S	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$	$1.5 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$1.5 \times 10^{+3}$	$2.6 \times 10^{+7}$	$3.7 \times 10^{+1}$	$7.4 \times 10^{+4}$
Berkelium (97)	Bk-249	S	$3.3 \times 10^{+1}$	$7.4 \times 10^{+8}$	1.1×10^{-0}	$2.2 \times 10^{+7}$
		I	$3.7 \times 10^{+3}$	$7.4 \times 10^{+8}$	$1.5 \times 10^{+2}$	$2.2 \times 10^{+7}$
	Bk-250	S	$3.7 \times 10^{+3}$	$2.2 \times 10^{+8}$	$1.8 \times 10^{+2}$	$7.4 \times 10^{+6}$
		I	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
Beryllium(4)	Be-7	S	$2.2 \times 10^{+4}$	$1.8 \times 10^{+3}$	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$1.8 \times 10^{+9}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+7}$
Bismuth (83)	Bi-206	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3.7 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.5 \times 10^{+6}$
	Bi-207	S	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$	$2.2 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$3.7 \times 10^{+2}$	$7.4 \times 10^{+7}$	$1.8 \times 10^{+1}$	$2.2 \times 10^{+6}$
	Bi-210	S	$2.2 \times 10^{+2}$	$3.7 \times 10^{+7}$	7.4×10^{-0}	$1.5 \times 10^{+6}$
		I	$2.2 \times 10^{+2}$	$3.7 \times 10^{+7}$	7.4×10^{-0}	$1.5 \times 10^{+6}$
	Bi-212	S	$3.7 \times 10^{+3}$	$3.7 \times 10^{+7}$	$1.1 \times 10^{+2}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.5 \times 10^{+7}$
Bromine (35)	Br-82	S	$3.7 \times 10^{+4}$	$3 \times 10^{+8}$	$1.5 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
Cadmium (48)	Cd-109	S	$1.8 \times 10^{+3}$	$1.8 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Cd-115m	S	$1.5 \times 10^{+3}$	$2.6 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.1 \times 10^{+6}$
	Cd-115	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
Calcium (20)	Ca-45	S	$1.1 \times 10^{+3}$	$1.1 \times 10^{+7}$	$3.7 \times 10^{+1}$	$3.3 \times 10^{+5}$
		I	$3.7 \times 10^{+3}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Ca-47	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.8 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
Californium (98)	Cf-249	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	1.8×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$3.7 \times 10^{+7}$	1.1×10^{-1}	$7.4 \times 10^{+5}$
	Cf-250	S	1.8×10^{-1}	$1.5 \times 10^{+7}$	7.4×10^{-3}	$3.7 \times 10^{+5}$
		I	3.7×10^{-0}	$2.6 \times 10^{+7}$	1.1×10^{-1}	$1.1 \times 10^{+6}$
	Cf-251	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	2.2×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.1×10^{-1}	$1.1 \times 10^{+6}$
	Cf-252	S	2.2×10^{-1}	$7.4 \times 10^{+6}$	7.4×10^{-3}	$2.6 \times 10^{+5}$
		I	1.1×10^{-0}	$7.4 \times 10^{+6}$	3.7×10^{-2}	$2.6 \times 10^{+5}$
	Cf-253	S	$3 \times 10^{+1}$	$1.5 \times 10^{+8}$	1.1×10^{-0}	$3.7 \times 10^{+6}$
		I	$3 \times 10^{+1}$	$1.5 \times 10^{+8}$	1.1×10^{-0}	$3.7 \times 10^{+6}$
	Cf-254	S	1.8×10^{-1}	$1.5 \times 10^{+5}$	7.4×10^{-3}	$3.7 \times 10^{+3}$
		I	1.8×10^{-1}	$1.5 \times 10^{+5}$	7.4×10^{-3}	$3.7 \times 10^{+3}$
Carbon (6)	C-14	S	$1.5 \times 10^{+5}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$
	(CO_2)	Sub[2]	$1.8 \times 10^{+6}$	—	$3.7 \times 10^{+4}$	—
Cerium (58)	Ce-141	S	$1.5 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.8 \times 10^{+2}$	$3.3 \times 10^{+6}$
	Ce-143	S	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.3 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.5 \times 10^{+6}$
	Ce-144	S	$3.7 \times 10^{+2}$	$1.1 \times 10^{+7}$	$1.1 \times 10^{+1}$	$3.7 \times 10^{+5}$
		I	$2.2 \times 10^{+2}$	$1.1 \times 10^{+7}$	7.4×10^{-0}	$3.7 \times 10^{+5}$
Caesium (55)	Cs-131	S	$3.7 \times 10^{+5}$	$2.6 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
		I	$1.1 \times 10^{+5}$	$1.1 \times 10^{+9}$	$3.7 \times 10^{+3}$	$3.3 \times 10^{+7}$
	Cs-134m	S	$1.5 \times 10^{+6}$	$7.4 \times 10^{+9}$	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$
		I	$2.2 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$
	Cs-134	S	$1.5 \times 10^{+3}$	$1.1 \times 10^{+7}$	$3.7 \times 10^{+1}$	$3.3 \times 10^{+5}$
		I	$3.7 \times 10^{+2}$	$3.7 \times 10^{+7}$	$1.5 \times 10^{+1}$	$1.5 \times 10^{+6}$
	Cs-135	S	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+7}$
		I	$3.3 \times 10^{+3}$	$2.6 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Cs-136	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$	$2.2 \times 10^{+2}$	$2.2 \times 10^{+6}$
	Cs-137	S	$2.2 \times 10^{+3}$	$1.5 \times 10^{+7}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$
		I	$3.7 \times 10^{+2}$	$3.7 \times 10^{+7}$	$1.8 \times 10^{+1}$	$1.5 \times 10^{+6}$
Chlorine (17)	Cl-36	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3 \times 10^{+6}$
		I	$7.4 \times 10^{+2}$	$7.4 \times 10^{+7}$	$3 \times 10^{+1}$	$2.2 \times 10^{+6}$
	Cl-38	S	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.5 \times 10^{+7}$
Chromium (24)	Cr-51	S	$3.7 \times 10^{+5}$	$1.8 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$1.8 \times 10^{+9}$	$3 \times 10^{+3}$	$7.4 \times 10^{+7}$
Cobalt (27)	Co-57	S	$1.1 \times 10^{+5}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+3}$	$1.8 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+8}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+7}$
	Co-58m	S	$7.4 \times 10^{+5}$	$3 \times 10^{+9}$	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$
		I	$3.3 \times 10^{+5}$	$2.2 \times 10^{+9}$	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$
	Co-58	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+3}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+1}$	$3.3 \times 10^{+6}$
	Co-60	S	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.8 \times 10^{+6}$
		I	$3.3 \times 10^{+2}$	$3.7 \times 10^{+7}$	$1.1 \times 10^{+1}$	$1.1 \times 10^{+6}$
Copper (29)	Cu-64	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
Curium (96)	Cm-242	S	3.7×10^{-0}	$2.6 \times 10^{+7}$	1.5×10^{-1}	$7.4 \times 10^{+5}$
		I	7.4×10^{-0}	$2.6 \times 10^{+7}$	2.2×10^{-1}	$7.4 \times 10^{+5}$
	Cm-243	S	2.2×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.8 \times 10^{+5}$
		I	3.7×10^{-0}	$2.6 \times 10^{+7}$	1.1×10^{-1}	$7.4 \times 10^{+5}$
	Cm-244	S	3.3×10^{-1}	$7.4 \times 10^{+6}$	1.1×10^{-2}	$2.6 \times 10^{+5}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.1×10^{-1}	$1.1 \times 10^{+6}$
	Cm-245	S	1.8×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	Cm-246	S	1.8×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	Cm-247	S	1.8×10^{-1}	$3.7 \times 10^{+6}$	7.4×10^{-3}	$1.5 \times 10^{+5}$
		I	3.7×10^{-0}	$2.2 \times 10^{+7}$	1.5×10^{-1}	$7.4 \times 10^{+5}$
	Cm-248	S	2.2×10^{-2}	$3.7 \times 10^{+5}$	7.4×10^{-4}	$1.5 \times 10^{+4}$
		I	3.7×10^{-1}	$1.5 \times 10^{+6}$	1.5×10^{-2}	$3.7 \times 10^{+4}$
	Cm-249	S	$3.7 \times 10^{+5}$	$2.2 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
		I	$3.7 \times 10^{+5}$	$2.2 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
Dysprosium (66)	Dy-165	S	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.5 \times 10^{+7}$
	Dy-166	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.5 \times 10^{+6}$
Einsteinium (99)	Es-253	S	$3 \times 10^{+1}$	$2.6 \times 10^{+7}$	1.1×10^{-0}	$7.4 \times 10^{+5}$
		I	$2.2 \times 10^{+1}$	$2.6 \times 10^{+7}$	7.4×10^{-1}	$7.4 \times 10^{+5}$
	Es-254m	S	$1.8 \times 10^{+2}$	$1.8 \times 10^{+7}$	7.4×10^{-0}	$7.4 \times 10^{+5}$
		I	$2.2 \times 10^{+2}$	$1.8 \times 10^{+7}$	7.4×10^{-0}	$7.4 \times 10^{+5}$
	Es-254	S	7.4×10^{-1}	$1.5 \times 10^{+7}$	2.2×10^{-2}	$3.7 \times 10^{+5}$
		I	3.7×10^{-0}	$1.5 \times 10^{+7}$	1.5×10^{-1}	$3.7 \times 10^{+5}$
	Es-255	S	$1.8 \times 10^{+1}$	$3 \times 10^{+7}$	7.4×10^{-1}	$1.1 \times 10^{+6}$
		I	$1.5 \times 10^{+1}$	$3 \times 10^{+7}$	3.7×10^{-1}	$1.1 \times 10^{+6}$
Erbium (68)	Er-169	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$
	Er-169	I	$1.5 \times 10^{+4}$	$1.1 \times 10^{+8}$	$3.7 \times 10^{+2}$	$3.3 \times 10^{+6}$
	Er-171	S	$2.6 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Europium (63)	Eu-152 (T_r=9.2hrs.)	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
	Eu-152 (T^r = 13 yrs.)	S	$3.7 \times 10^{+2}$	$7.4 \times 10^{+7}$	$1.5 \times 10^{+1}$	$3 \times 10^{+6}$
		I	$7.4 \times 10^{+2}$	$7.4 \times 10^{+7}$	$2.2 \times 10^{+1}$	$3 \times 10^{+6}$
	Eu-154	S	$1.5 \times 10^{+2}$	$2.2 \times 10^{+7}$	3.7×10^{-0}	$7.4 \times 10^{+5}$
		I	$2.6 \times 10^{+2}$	$2.2 \times 10^{+7}$	7.4×10^{-0}	$7.4 \times 10^{+5}$
	Eu-155	S	$3.3 \times 10^{+3}$	$2.2 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$2.2 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$
Fermium (100)	Fm-254	S	$2.2 \times 10^{+3}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+1}$	$3.7 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+1}$	$3.7 \times 10^{+6}$
	Fm-255	S	$7.4 \times 10^{+2}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+1}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+2}$	$3.7 \times 10^{+7}$	$1.5 \times 10^{+1}$	$1.1 \times 10^{+6}$
	Fm-256	S	$1.1 \times 10^{+2}$	$1.1 \times 10^{+6}$	3.7×10^{-0}	$3.3 \times 10^{+4}$
		I	$7.4 \times 10^{+1}$	$1.1 \times 10^{+6}$	2.2×10^{-0}	$3.3 \times 10^{+4}$
Fluorine (9)	F-18	S	$1.8 \times 10^{+5}$	$7.4 \times 10^{+8}$	$7.4 \times 10^{+3}$	$3 \times 10^{+7}$
		I	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.8 \times 10^{+7}$
Gadolinium (64)	Gd-153	S	$7.4 \times 10^{+3}$	$2.2 \times 10^{+8}$	$3 \times 10^{+2}$	$7.4 \times 10^{+6}$
		I	$3.3 \times 10^{+3}$	$2.2 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
	Gd-159	S	$1.8 \times 10^{+4}$	$2.2 \times 10^{+7}$	$7.4 \times 10^{+2}$	$3 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$2.2 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3 \times 10^{+6}$
Gallium (31)	Ga-72	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
Germanium (32)	Ge-71	S	$3.7 \times 10^{+5}$	$1.8 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
		I	$2.2 \times 10^{+5}$	$1.8 \times 10^{+9}$	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$
Gold (79)	Au-196	S	$3.7 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$2.2 \times 10^{+4}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Au-198	S	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.8 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.8 \times 10^{+6}$
	Au-199	S	$3.7 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
Hafnium (72)	Hf-181	S	$1.5 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+1}$	$2.6 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.1 \times 10^{+2}$	$2.6 \times 10^{+6}$
Holmium (67)	Ho-166	S	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
Hydrogen (1)	H-3	S	$1.8 \times 10^{+5}$	$3.7 \times 10^{+9}$	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$
		I	$1.8 \times 10^{+5}$	$3.7 \times 10^{+9}$	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$
		Sub[2]	$7.4 \times 10^{+7}$	—	$1.5 \times 10^{+6}$	—
Indium (49)	In-113m	S	$3 \times 10^{+5}$	$1.5 \times 10^{+9}$	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$
		I	$2.6 \times 10^{+5}$	$1.5 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$
	In-114m	S	$3.7 \times 10^{+3}$	$1.8 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$7.4 \times 10^{+2}$	$1.8 \times 10^{+7}$	$2.6 \times 10^{+1}$	$7.4 \times 10^{+5}$
	In-115m	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.5 \times 10^{+7}$
	In-115	S	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$	$3.3 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$1.1 \times 10^{+8}$	$3.7 \times 10^{+1}$	$3.3 \times 10^{+6}$
Iodine (53)	I-125	S	$1.8 \times 10^{+2}$	$1.5 \times 10^{+6}$	3×10^{-0}	$7.4 \times 10^{+3}$
		I	$7.4 \times 10^{+3}$	$2.2 \times 10^{+8}$	$2.2 \times 10^{+2}$	$7.4 \times 10^{+6}$
	I-126	S	$3 \times 10^{+2}$	$1.8 \times 10^{+6}$	3.3×10^{-0}	$1.1 \times 10^{+4}$
		I	$1.1 \times 10^{+4}$	$1.1 \times 10^{+8}$	$3.7 \times 10^{+2}$	$3.3 \times 10^{+6}$
	I-129	S	$7.4 \times 10^{+2}$	$3.7 \times 10^{+5}$	7.4×10^{-1}	$2.2 \times 10^{+3}$
		I	$2.6 \times 10^{+3}$	$2.2 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
	I-131	S	$3.3 \times 10^{+2}$	$2.2 \times 10^{+6}$	3.7×10^{-0}	$1.1 \times 10^{+4}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
	I-132	S	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.1 \times 10^{+2}$	$3 \times 10^{+5}$
		I	$3.3 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
	I-133	S	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$	$1.5 \times 10^{+1}$	$3.7 \times 10^{+4}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.5 \times 10^{+6}$
	I-134	S	$1.8 \times 10^{+4}$	$1.5 \times 10^{+8}$	$2.2 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$1.1 \times 10^{+5}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$
	I-135	S	$3.7 \times 10^{+3}$	$2.6 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.5 \times 10^{+5}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I		Table II	
			Column 1 *Air*	**Column 2** *Water*	**Column 1** *Air*	**Column 2** *Water*
			(becquerels per cubic metre)			
		I	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.6 \times 10^{+6}$
Iridium (77)	Ir-190	S	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$1.8 \times 10^{+8}$	$3.7 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Ir-192	S	$3.7 \times 10^{+3}$	$3.7 \times 10^{+7}$	$1.5 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3.3 \times 10^{+1}$	$1.5 \times 10^{+6}$
	Ir-194	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
Iron (26)	Fe-55	S	$3.3 \times 10^{+4}$	$7.4 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$2.6 \times 10^{+9}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+7}$
	Fe-59	S	$3.7 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.8 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.8 \times 10^{+3}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$1.8 \times 10^{+6}$
Krypton (36)	Kr-95m	Sub[2]	$2.2 \times 10^{+5}$	—	$3.7 \times 10^{+3}$	—
	Kr-85	Sub	$3.7 \times 10^{+5}$	—	$1.1 \times 10^{+4}$	—
	Kr-87	Sub	$3.7 \times 10^{+4}$	—	$7.4 \times 10^{+2}$	—
	Kr-88	Sub	$3.7 \times 10^{+4}$	—	$7.4 \times 10^{+2}$	—
Lanthanum (57)	La-140	S	$7.4 \times 10^{+3}$	$2.6 \times 10^{+7}$	$1.8 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$3.7 \times 10^{+3}$	$2.6 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
Lead (82)	Pb-203	S	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.5 \times 10^{+7}$
	Pb-210	S	3.7×10^{-0}	$1.5 \times 10^{+5}$	1.5×10^{-1}	$3.7 \times 10^{+3}$
		I	7.4×10^{-0}	$1.8 \times 10^{+8}$	3×10^{-1}	$7.4 \times 10^{+6}$
	Pb-212	S	$7.4 \times 10^{+2}$	$2.2 \times 10^{+7}$	$2.2 \times 10^{+1}$	$7.4 \times 10^{+5}$
		I	$7.4 \times 10^{+2}$	$1.8 \times 10^{+7}$	$2.6 \times 10^{+1}$	$7.4 \times 10^{+5}$
Lutetium (71)	Lu-177	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Manganese (25)	Mn-52	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3.3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
	Mn-54	S	$1.5 \times 10^{+4}$	$1.5 \times 10^{+8}$	$3.7 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$1.5 \times 10^{+3}$	$1.1 \times 10^{+8}$	$3.7 \times 10^{+1}$	$3.7 \times 10^{+6}$
	Mn-56	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Mercury (80)	Hg-197m	S	$2.6 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
	Hg-197	S	$3.7 \times 10^{+4}$	$3.3 \times 10^{+8}$	$1.5 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.8 \times 10^{+7}$
	Hg-203	S	$2.6 \times 10^{+3}$	$1.8 \times 10^{+7}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$
		I	$3.7 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.5 \times 10^{+2}$	$3.7 \times 10^{+6}$
Molybdenum (42)	Mr-99	S	$2.6 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.5 \times 10^{+6}$
Neodymium (60)	Nd-144	S	3×10^{-0}	$7.4 \times 10^{+7}$	1.1×10^{-1}	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+1}$	$7.4 \times 10^{+7}$	3.7×10^{-1}	$3 \times 10^{+6}$
	Nd-147	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3 \times 10^{+2}$	$2.2 \times 10^{+6}$
	Nd-149	S	$7.4 \times 10^{+4}$	$3 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$3 \times 10^{+8}$	$1.8 \times 10^{+3}$	$1.1 \times 10^{+7}$
Neptunium (93)	Np-237	S	1.5×10^{-1}	$3.3 \times 10^{+6}$	3.7×10^{-3}	$1.1 \times 10^{+5}$
		I	3.7×10^{-0}	$3.3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	Np-239	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$2.6 \times 10^{+4}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Nickel (28)	Ni-59	S	$1.8 \times 10^{+4}$	$2.2 \times 10^{+8}$	$7.4 \times 10^{+2}$	$7.4 \times 10^{+6}$
		I	$3 \times 10^{+4}$	$2.2 \times 10^{+9}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+7}$
	Ni-63	S	$2.2 \times 10^{+3}$	$3 \times 10^{+7}$	$7.4 \times 10^{+1}$	$1.1 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+2}$	$2.6 \times 10^{+7}$
	Ni-65	S	$3.3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Niobium (41)	Nb-93m	S	$3.7 \times 10^{+3}$	$3.7 \times 10^{+8}$	$1.5 \times 10^{+2}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+8}$	$1.8 \times 10^{+2}$	$1.5 \times 10^{+7}$
	Nb-95	S	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.1 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Nb-97	S	$2.2 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$
		I	$1.8 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$
Osmium (76)	Os-185	S	$1.8 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.8 \times 10^{+3}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+1}$	$2.6 \times 10^{+6}$
	Os-191m	S	$7.4 \times 10^{+5}$	$2.6 \times 10^{+9}$	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$
		I	$3.3 \times 10^{+5}$	$2.6 \times 10^{+9}$	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$
	Os-191	S	$3.7 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$1.8 \times 10^{+8}$	$3.7 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Os-193	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.3 \times 10^{+2}$	$1.8 \times 10^{+6}$
Palladium (46)	Pd-103	S	$3.7 \times 10^{+4}$	$3.7 \times 10^{+8}$	$1.8 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$2.6 \times 10^{+4}$	$3 \times 10^{+8}$	$1.1 \times 10^{+3}$	$1.1 \times 10^{+7}$
	Pd-109	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.6 \times 10^{+6}$
Phosphorus (15)	P-32	S	$2.6 \times 10^{+3}$	$1.8 \times 10^{+7}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$
		I	$3 \times 10^{+3}$	$2.6 \times 10^{+7}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+5}$
Platinum (78)	Pt-191	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Pt-193m	S	$2.6 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$
		I	$1.8 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$
	Pt-193	S	$3.7 \times 10^{+4}$	$1.1 \times 10^{+9}$	$1.5 \times 10^{+3}$	$3.3 \times 10^{+7}$
		I	$1.1 \times 10^{+4}$	$1.8 \times 10^{+9}$	$3.7 \times 10^{+2}$	$7.4 \times 10^{+7}$
	Pt-197m	S	$2.2 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$
		I	$1.8 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$
	Pt-197	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I		Table II	
			Column 1 *Air*	**Column 2** *Water*	**Column 1** *Air*	**Column 2** *Water*
			(becquerels per cubic metre)			
		I	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Plutonium (94)	Pu-238	S	7.4×10^{-1}	$3.7 \times 10^{+6}$	2.6×10^{-3}	$1.8 \times 10^{+5}$
		I	1.1×10^{-0}	$3 \times 10^{+7}$	3.7×10^{-2}	$1.1 \times 10^{+6}$
	Pu-239	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	2.2×10^{-3}	$1.8 \times 10^{+5}$
		I	1.5×10^{-0}	$3 \times 10^{+7}$	3.7×10^{-2}	$1.1 \times 10^{+6}$
	Pu-240	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	2.2×10^{-3}	$1.8 \times 10^{+5}$
		I	1.5×10^{-0}	$3 \times 10^{+7}$	3.7×10^{-2}	$1.1 \times 10^{+6}$
	Pu-241	S	3.3×10^{-0}	$2.6 \times 10^{+8}$	1.1×10^{-1}	$7.4 \times 10^{+6}$
		I	$1.5 \times 10^{+3}$	$1.5 \times 10^{+9}$	$3.7 \times 10^{+1}$	$3.7 \times 10^{+7}$
	Pu-242	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	2.2×10^{-3}	$1.8 \times 10^{+5}$
		I	1.5×10^{-0}	$3.3 \times 10^{+7}$	3.7×10^{-2}	$1.1 \times 10^{+6}$
	Pu-243	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3 \times 10^{+3}$	$1.1 \times 10^{+7}$
	Pu-244	S	7.4×10^{-2}	$3.7 \times 10^{+6}$	2.2×10^{-3}	$1.5 \times 10^{+5}$
		I	1.1×10^{-0}	$1.1 \times 10^{+7}$	3.7×10^{-2}	$3.7 \times 10^{+5}$
Polonium (84)	Po-210	S	$1.8 \times 10^{+1}$	$7.4 \times 10^{+5}$	7.4×10^{-1}	$2.6 \times 10^{+4}$
		I	7.4×10^{-0}	$3 \times 10^{+7}$	2.6×10^{-1}	$1.1 \times 10^{+6}$
Potassium (19)	K-42	S	$7.4 \times 10^{+4}$	$3.3 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
Praseodymium (59)	Pr-142	S	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
	Pr-143	S	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.8 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.8 \times 10^{+6}$
Promethium (61)	Pm-147	S	$2.2 \times 10^{+3}$	$2.2 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$2.2 \times 10^{+8}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Pm-149	S	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.5 \times 10^{+6}$
Protactinium (91)	Pa-230	S	$7.4 \times 10^{+1}$	$2.6 \times 10^{+8}$	2.2×10^{-0}	$7.4 \times 10^{+6}$
		I	$3 \times 10^{+1}$	$2.6 \times 10^{+8}$	1.1×10^{-0}	$7.4 \times 10^{+6}$
	Pa-231	S	3.7×10^{-2}	$1.1 \times 10^{+6}$	1.5×10^{-3}	$3.3 \times 10^{+4}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$7.4 \times 10^{+5}$
	Pa-233	S	$2.2 \times 10^{+4}$	$1.5 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$	$2.2 \times 10^{+2}$	$3.7 \times 10^{+6}$
Radium (88)	Ra-223	S	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$	2.2×10^{-0}	$2.6 \times 10^{+4}$
		I	7.4×10^{-0}	$3.7 \times 10^{+6}$	3×10^{-1}	$1.5 \times 10^{+5}$
	Ra-224	S	$1.8 \times 10^{+2}$	$2.6 \times 10^{+6}$	7.4×10^{-0}	$7.4 \times 10^{+4}$
		I	$2.6 \times 10^{+1}$	$7.4 \times 10^{+6}$	7.4×10^{-1}	$1.8 \times 10^{+5}$
	Ra-226	S	1.1×10^{-0}	$1.5 \times 10^{+4}$	1.1×10^{-1}	$1.1 \times 10^{+3}$
		I	1.8×10^{-0}	$3.3 \times 10^{+7}$	7.4×10^{-2}	$1.1 \times 10^{+6}$
	Ra-228	S	2.6×10^{-0}	$3 \times 10^{+4}$	7.4×10^{-2}	$1.1 \times 10^{+3}$
		I	1.5×10^{-0}	$2.6 \times 10^{+7}$	3.7×10^{-2}	$1.1 \times 10^{+6}$
Radon (86)	Rn-220	S	$1.1 \times 10^{+4}$	—	$3.7 \times 10^{+2}$	—

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
	Rn-222	S[3]	$1.1 \times 10^{+3}$	—	$1.1 \times 10^{+2}$	—
Rhenium (75)	Re-183	S	$1.1 \times 10^{+5}$	$7.4 \times 10^{+8}$	$3.3 \times 10^{+3}$	$2.2 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3 \times 10^{+8}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+7}$
	Re-186	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.8 \times 10^{+6}$
	Re-187	S	$3.3 \times 10^{+5}$	$2.6 \times 10^{+9}$	$1.1 \times 10^{+4}$	$1.1 \times 10^{+8}$
		I	$1.8 \times 10^{+4}$	$1.5 \times 10^{+9}$	$7.4 \times 10^{+2}$	$7.4 \times 10^{+7}$
	Re-188	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
Rhodium (45)	Rh-103m	S	$3 \times 10^{+6}$	$1.5 \times 10^{+10}$	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$
		I	$2.2 \times 10^{+6}$	$1.1 \times 10^{+0}$	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$
	Rh-105	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Rubidium (37)	Rb-86	S	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$2.6 \times 10^{+7}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$
	Rb-87	S	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$2.6 \times 10^{+3}$	$1.8 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
Ruthenium (44)	Ru-97	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.1 \times 10^{+7}$
	Ru-103	S	$1.8 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$3 \times 10^{+6}$
		I	$3 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.1 \times 10^{+2}$	$3 \times 10^{+6}$
	Ru-105	S	$2.6 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Ru-106	S	$3 \times 10^{+3}$	$1.5 \times 10^{+7}$	$1.1 \times 10^{+2}$	$3.7 \times 10^{+5}$
		I	$2.2 \times 10^{+2}$	$1.1 \times 10^{+7}$	7.4×10^{-0}	$3.7 \times 10^{+5}$
Samarium (62)	Sm-147	S	2.6×10^{-0}	$7.4 \times 10^{+7}$	7.4×10^{-2}	$2.2 \times 10^{+6}$
		I	$1.1 \times 10^{+1}$	$7.4 \times 10^{+7}$	3.3×10^{-1}	$2.6 \times 10^{+6}$
	Sm-151	S	$2.2 \times 10^{+3}$	$3.7 \times 10^{+8}$	$7.4 \times 10^{+1}$	$1.5 \times 10^{+7}$
		I	$3.7 \times 10^{+3}$	$3.7 \times 10^{+8}$	$1.8 \times 10^{+2}$	$1.5 \times 10^{+7}$
	Sm-153	S	$1.8 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$3 \times 10^{+6}$
		I	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3 \times 10^{+6}$
Scandium (21)	Sc-46	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+2}$	$3.7 \times 10^{+7}$	$3 \times 10^{+1}$	$1.5 \times 10^{+6}$
	Sc-47	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$
	Sc-48	S	$7.4 \times 10^{+3}$	$3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
Selenium (34)	Se-75	S	$3.7 \times 10^{+4}$	$3.3 \times 10^{+8}$	$1.5 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$3.7 \times 10^{+3}$	$3 \times 10^{+8}$	$1.5 \times 10^{+2}$	$1.1 \times 10^{+7}$
Silicon (14)	Si-31	S	$2.2 \times 10^{+5}$	$1.1 \times 10^{+9}$	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
Silver (47)	Ag-105	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.3 \times 10^{+6}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I		Table II	
			Column 1 *Air*	**Column 2** *Water*	**Column 1** *Air*	**Column 2** *Water*
			(becquerels per cubic metre)			
		I	$3 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.1 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Ag-110m	S	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+2}$	$3.3 \times 10^{+7}$	$1.1 \times 10^{+1}$	$1.1 \times 10^{+6}$
	Ag-111	S	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.5 \times 10^{+6}$
Sodium (11)	Na-22	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$3.3 \times 10^{+2}$	$3.3 \times 10^{+7}$	$1.1 \times 10^{+1}$	$1.1 \times 10^{+6}$
	Na-24	S	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
Strontium (38)	Sr-85m	S	$1.5 \times 10^{+6}$	$7.4 \times 10^{+9}$	$3.7 \times 10^{+4}$	$2.6 \times 10^{+8}$
		I	$1.1 \times 10^{+6}$	$7.4 \times 10^{+9}$	$3.7 \times 10^{+4}$	$2.6 \times 10^{+8}$
	Sr-85	S	$7.4 \times 10^{+3}$	$1.1 \times 10^{+8}$	$3 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$1.8 \times 10^{+8}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Sr-89	S	$1.1 \times 10^{+3}$	$1.1 \times 10^{+7}$	$1.1 \times 10^{+1}$	$1.1 \times 10^{+5}$
		I	$1.5 \times 10^{+3}$	$3 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.1 \times 10^{+5}$
	Sr-90	S	$3.7 \times 10^{+1}$	$3.7 \times 10^{+5}$	1.1×10^{-0}	$1.1 \times 10^{+4}$
		I	$1.8 \times 10^{+2}$	$3.7 \times 10^{+7}$	7.4×10^{-0}	$1.5 \times 10^{+6}$
	Sr-91	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$3.7 \times 10^{+7}$	$3.3 \times 10^{+2}$	$1.8 \times 10^{+6}$
	Sr-92	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
Sulphur (16)	S-35	S	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.3 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$3 \times 10^{+8}$	$3.3 \times 10^{+2}$	$1.1 \times 10^{+7}$
Tantalum (73)	Ta-182	S	$1.5 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.5 \times 10^{+6}$
		I	$7.4 \times 10^{+2}$	$3.7 \times 10^{+7}$	$2.6 \times 10^{+1}$	$1.5 \times 10^{+6}$
Technetium (43)	Tc-96m	S	$3 \times 10^{+6}$	$1.5 \times 10^{+10}$	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$
		I	$1.1 \times 10^{+6}$	$1.1 \times 10^{+10}$	$3.7 \times 10^{+4}$	$3.7 \times 10^{+8}$
	Tc-96	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.8 \times 10^{+6}$
	Tc-97m	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$1.8 \times 10^{+8}$	$1.8 \times 10^{+2}$	$7.4 \times 10^{+6}$
	Tc-97	S	$3.7 \times 10^{+5}$	$1.8 \times 10^{+9}$	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+2}$	$3 \times 10^{+7}$
	Tc-99m	S	$1.5 \times 10^{+6}$	$7.4 \times 10^{+9}$	$3.7 \times 10^{+4}$	$2.2 \times 10^{+8}$
		I	$3.7 \times 10^{+5}$	$3 \times 10^{+9}$	$1.8 \times 10^{+4}$	$1.1 \times 10^{+8}$
	Tc-99	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$2.2 \times 10^{+3}$	$1.8 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
Tellurium (52)	Te-125m	S	$1.5 \times 10^{+4}$	$1.8 \times 10^{+8}$	$3.7 \times 10^{+2}$	$7.4 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.5 \times 10^{+2}$	$3.7 \times 10^{+6}$
	Te-127m	S	$3.7 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.8 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.5 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.8 \times 10^{+6}$
	Te-127	S	$7.4 \times 10^{+4}$	$3 \times 10^{+8}$	$2.2 \times 10^{+3}$	$1.1 \times 10^{+7}$

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	$3.3 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
	Te-129m	S	$3 \times 10^{+3}$	$3.7 \times 10^{+7}$	$1.1 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$2.2 \times 10^{+7}$	$3.7 \times 10^{+1}$	$7.4 \times 10^{+5}$
	Te-129	S	$1.8 \times 10^{+5}$	$7.4 \times 10^{+8}$	$7.4 \times 10^{+3}$	$3 \times 10^{+7}$
		I	$1.5 \times 10^{+5}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$
	Te-131m	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.5 \times 10^{+6}$
	Te-132	S	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.6 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
Terbium (65)	Tb-160	S	$3.7 \times 10^{+3}$	$3.7 \times 10^{+7}$	$1.1 \times 10^{+2}$	$1.5 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.5 \times 10^{+6}$
Thallium (81)	Tl-200	S	$1.1 \times 10^{+5}$	$3.7 \times 10^{+8}$	$3.3 \times 10^{+3}$	$1.5 \times 10^{+7}$
		I	$3.7 \times 10^{+4}$	$2.6 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
	Tl-201	S	$7.4 \times 10^{+4}$	$3.3 \times 10^{+8}$	$2.6 \times 10^{+3}$	$1.1 \times 10^{+7}$
		I	$3.3 \times 10^{+4}$	$1.8 \times 10^{+8}$	$1.1 \times 10^{+3}$	$7.4 \times 10^{+6}$
	Tl-202	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3 \times 10^{+2}$	$2.6 \times 10^{+6}$
	Tl-204	S	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3.3 \times 10^{+1}$	$2.2 \times 10^{+6}$
Thorium (90)	Th-227	S	$1.1 \times 10^{+1}$	$1.8 \times 10^{+7}$	3.7×10^{-1}	$7.4 \times 10^{+5}$
		I	7.4×10^{-0}	$1.8 \times 10^{+7}$	2.2×10^{-1}	$7.4 \times 10^{+5}$
	Th-228	S	3.3×10^{-1}	$7.4 \times 10^{+6}$	1.1×10^{-2}	$2.6 \times 10^{+5}$
		I	2.2×10^{-1}	$1.5 \times 10^{+7}$	7.4×10^{-3}	$3.7 \times 10^{+5}$
	Th-230	S	7.4×10^{-2}	$1.8 \times 10^{+6}$	3×10^{-3}	$7.4 \times 10^{+4}$
		I	3.7×10^{-1}	$3.3 \times 10^{+7}$	1.1×10^{-2}	$1.1 \times 10^{+6}$
	Th-231	S	$3.7 \times 10^{+4}$	$2.6 \times 10^{+8}$	$1.8 \times 10^{+3}$	$7.4 \times 10^{+6}$
		I	$3.7 \times 10^{+4}$	$2.6 \times 10^{+8}$	$1.5 \times 10^{+3}$	$7.4 \times 10^{+6}$
	Th-232	S	1.1×10^{-0}	$1.8 \times 10^{+6}$	3.7×10^{-2}	$7.4 \times 10^{+4}$
		I	1.1×10^{-0}	$3.7 \times 10^{+7}$	3.7×10^{-2}	$1.5 \times 10^{+6}$
	Th	S	2.2×10^{-0}	$2.2 \times 10^{+6}$	7.4×10^{-2}	$7.4 \times 10^{+4}$
	natural	I	2.2×10^{-0}	$2.2 \times 10^{+7}$	7.4×10^{-2}	$7.4 \times 10^{+5}$
	Th-234	S	$2.2 \times 10^{+3}$	$1.8 \times 10^{+7}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+5}$
		I	$1.1 \times 10^{+3}$	$1.8 \times 10^{+7}$	$3.7 \times 10^{+1}$	$7.4 \times 10^{+5}$
Thulium (69)	Tm-170	S	$1.5 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.8 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.8 \times 10^{+6}$
	Tm-171	S	$3.7 \times 10^{+3}$	$3.7 \times 10^{+8}$	$1.5 \times 10^{+2}$	$1.8 \times 10^{+7}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+8}$	$3 \times 10^{+2}$	$1.8 \times 10^{+7}$
Tin (50)	Sn-113	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$3.3 \times 10^{+6}$
		I	$1.8 \times 10^{+3}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+1}$	$3 \times 10^{+6}$
	Sn-125	S	$3.7 \times 10^{+3}$	$1.8 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$3 \times 10^{+3}$	$1.8 \times 10^{+7}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+5}$
Tungsten (74)	W-181	S	$7.4 \times 10^{+4}$	$3.7 \times 10^{+8}$	$3 \times 10^{+3}$	$1.5 \times 10^{+7}$

Schedule VIII Maximum concentrations of radioactive elements in air and water above natural background

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	$3.7 \times 10^{+3}$	$3.7 \times 10^{+8}$	$1.5 \times 10^{+2}$	$1.1 \times 10^{+7}$
	W-185	S	$3 \times 10^{+4}$	$1.5 \times 10^{+8}$	$1.1 \times 10^{+3}$	$3.7 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.5 \times 10^{+2}$	$3.7 \times 10^{+6}$
	W-187	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$7.4 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
Uranium (92)	U-230	S	$1.1 \times 10^{+1}$	$3.7 \times 10^{+6}$	3.7×10^{-1}	$1.8 \times 10^{+5}$
		I	3.7×10^{-0}	$3.7 \times 10^{+6}$	1.5×10^{-1}	$1.8 \times 10^{+5}$
	U-232	S	3.7×10^{-0}	$3 \times 10^{+7}$	1.1×10^{-1}	$1.1 \times 10^{+6}$
		I	1.1×10^{-0}	$3 \times 10^{+7}$	3.3×10^{-2}	$1.1 \times 10^{+6}$
	U-233	S	$1.8 \times 10^{+1}$	$3.3 \times 10^{+7}$	7.4×10^{-1}	$1.1 \times 10^{+6}$
		I	3.7×10^{-0}	$3.3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	U-234	S[4]	$2.2 \times 10^{+1}$	$3.3 \times 10^{+7}$	7.4×10^{-1}	$1.1 \times 10^{+6}$
		I	3.7×10^{-0}	$3.3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	U-235	S[4]	$1.8 \times 10^{+1}$	$3 \times 10^{+7}$	7.4×10^{-1}	$1.1 \times 10^{+6}$
		I	3.7×10^{-0}	$3 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	U-236	S	$2.2 \times 10^{+1}$	$3.7 \times 10^{+7}$	7.4×10^{-1}	$1.1 \times 10^{+6}$
		I	3.7×10^{-0}	$3.7 \times 10^{+7}$	1.5×10^{-1}	$1.1 \times 10^{+6}$
	U-238	S[4]	2.6×10^{-0}	$3.7 \times 10^{+7}$	1.1×10^{-1}	$1.5 \times 10^{+6}$
		I	3.7×10^{-0}	$3.7 \times 10^{+7}$	1.8×10^{-1}	$1.5 \times 10^{+6}$
	U-240	S	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$3 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$7.4 \times 10^{+3}$	$3.7 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
	U-natural	S	3.7×10^{-0}	$3.7 \times 10^{+7}$	1.8×10^{-1}	$1.1 \times 10^{+6}$
		I	3.7×10^{-0}	$3.7 \times 10^{+7}$	1.8×10^{-1}	$1.1 \times 10^{+6}$
Vanadium (23)	V-48	S	$7.4 \times 10^{+3}$	$3.3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$2.2 \times 10^{+3}$	$3 \times 10^{+7}$	$7.4 \times 10^{+1}$	$1.1 \times 10^{+6}$
Xenon (54)	Xe-131m	Sub	$7.4 \times 10^{+5}$	—	$1.5 \times 10^{+4}$	—
	Xe-133m	Sub	$3.7 \times 10^{+5}$	—	$1.1 \times 10^{+4}$	—
	Xe-133	Sub	$3.7 \times 10^{+5}$	—	$1.1 \times 10^{+4}$	—
	Xe-135	Sub	$1.5 \times 10^{+5}$	—	$3.7 \times 10^{+3}$	—
Ytterbium (70)	Yb-175	S	$2.6 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2.}$	$3.7 \times 10^{+6}$
		I	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$	$7.4 \times 10^{+2}$	$3.7 \times 10^{+6}$
Yttrium (39)	Y-90	S	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$3.7 \times 10^{+3}$	$2.2 \times 10^{+7}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+5}$
	Y-91m	S	$7.4 \times 10^{+5}$	$3.7 \times 10^{+9}$	$3 \times 10^{+4}$	$1.1 \times 10^{+8}$
		I	$7.4 \times 10^{+5}$	$3.7 \times 10^{+9}$	$2.2 \times 10^{+4}$	$1.1 \times 10^{+8}$
	Y-91	S	$1.5 \times 10^{+3}$	$3 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.1 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$3 \times 10^{+7}$	$3.7 \times 10^{+1}$	$1.1 \times 10^{+6}$
	Y-92	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
	Y-93	S	$7.4 \times 10^{+3}$	$3 \times 10^{+7}$	$2.2 \times 10^{+2}$	$1.1 \times 10^{+6}$
		I	$3.7 \times 10^{+3}$	$3 \times 10^{+7}$	$1.8 \times 10^{+2}$	$1.1 \times 10^{+6}$
Zinc (30)	Zn-65	S	$3.7 \times 10^{+3}$	$1.1 \times 10^{+8}$	$1.5 \times 10^{+2}$	$3.7 \times 10^{+6}$

Element (atomic number)	*Isotope*[1]		Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
			(becquerels per cubic metre)			
		I	$2.2 \times 10^{+3}$	$1.8 \times 10^{+8}$	$7.4 \times 10^{+1}$	$7.4 \times 10^{+6}$
	Zn-69m	S	$1.5 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+2}$	$2.2 \times 10^{+6}$
	Zn-69	S	$2.6 \times 10^{+5}$	$1.8 \times 10^{+9}$	$7.4 \times 10^{+3}$	$7.4 \times 10^{+7}$
		I	$3.3 \times 10^{+5}$	$1.8 \times 10^{+9}$	$1.1 \times 10^{+4}$	$7.4 \times 10^{+7}$
Zirconium (40)	Zr-93	S	$3.7 \times 10^{+3}$	$7.4 \times 10^{+8}$	$1.5 \times 10^{+2}$	$3 \times 10^{+7}$
		I	$1.1 \times 10^{+4}$	$7.4 \times 10^{+8}$	$3.7 \times 10^{+2}$	$3 \times 10^{+7}$
	Zr-95	S	$3.7 \times 10^{+3}$	$7.4 \times 10^{+7}$	$1.5 \times 10^{+2}$	$2.6 \times 10^{+6}$
		I	$1.1 \times 10^{+3}$	$7.4 \times 10^{+7}$	$3.7 \times 10^{+1}$	$2.6 \times 10^{+6}$
	Zr-97	S	$3.7 \times 10^{+3}$	$1.8 \times 10^{+7}$	$1.5 \times 10^{+2}$	$7.4 \times 10^{+5}$
		I	$3.3 \times 10^{+3}$	$1.8 \times 10^{+7}$	$1.1 \times 10^{+2}$	$7.4 \times 10^{+5}$
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radio-active half life less than 2 hours.		Sub[2]	$3.7 \times 10^{+4}$	—	$1.1 \times 10^{+3}$	—
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radio-active half life greater than 2 hours.			$1.1 \times 10^{+2}$	$3.3 \times 10^{+6}$	3.7×10^{-0}	$1.1 \times 10^{+5}$
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.			2.2×10^{-2}	1.5×10^{-4}	7.4×10^{-4}	$1.1 \times 10^{+3}$

1 Soluble (S); Insoluble (I).

2 "Sub" means that values given are for submersion in a semi-spherical infinite cloud of airborne material.

3 These radon concentrations are appropriate for protection from radon-222 combined with its short-lived daughters. Alternatively, the value in Table 1 may be replaced by one-third ($^1/_3$) "working level". (A "working level" is defined as any combination of short-lived radon-222 daughters, polonium-218, lead-214, bismuth-214, and

polonium-214, in one litre of air, without regard to the degree of equilibrium, that will result in the ultimate emission of 1.3×10^5 MeV of alpha particle energy.) The Table II value may be replaced by one-thirtieth ($^1/_{30}$) of a "working level". The limit on radon-222 concentrations in restricted areas may be based on an annual average.

[4] For soluble mixtures of U-238 and U-235 in air chemical toxicity may be the limiting factor. If the per cent by weight (enrichment) of U-235 is less than 5, the concentration value for a 40 hour work week, Table I, is 0.2 milligrams uranium per cubic metre of air average. For any enrichment the product of the average concentration and time of exposure during a 40-hour work week shall not exceed 8 x SA becquerels-hour/metre^3, where SA is the specific activity of the uranium inhaled. The concentration value for Table II is 0.007 milligrams uranium per cubic metre of air. The specific activity for natural uranium is 2.5×10^4 becquerels per gram uranium. The specific activity for other mixtures of U-238, U-235 and 234, if not known, shall be:

SA = 1.33 x 10 4 becquerels/gram U	U depleted
$SA = (0.4 + 0.38\ E + 0.0034\ E^2)\ 10^{-6}$	$E \geq 0.72$

where E is the percentage by weight of U-235, expressed as per cent.

(See notes at end of this Schedule and Appendix thereto)

Appendix to Schedule VIII

Note: In any case where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this Appendix should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in this Appendix for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

   Example: If radionuclides a, b, and c are present in concentrations C_a, C_b, and C_c, and if the applicable MPC's are MPC_a, MPC_b, and MPC_c, respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \frac{C_c}{MPC_c} \leq 1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of this Appendix shall be:

   a. For purposes of Table I, Col. 1 ..... 2.2×10^{-2}

   b. For purposes of Table I, Col. 2 ..... $1.5 \times 10^{+4}$

   c. For purposes of Table II, Col. 1 ..... 7.4×10^{-4}

   d. For purposes of Table II, Col. 2 ..... $1.1 \times 10^{+3}$

3. If any of the conditions specified below are met, the corresponding values specified below may be used in lieu of those specified in paragraph 2 above.

   a. If the identity of each radionuclide in the mixture is known, but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture is the limit specified in this Appendix for the radionuclide in the mixture having the lowest concentration limit; or

   b. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in this Appendix are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in this Appendix for any radionuclide which is not known to be absent from the mixture; or

c. Radionuclide	Table I Column 1 *Air*	Table I Column 2 *Water*	Table II Column 1 *Air*	Table II Column 2 *Water*
	(becquerels per cubic metre)			
If it is known that Sr-90, I-125, I-126, I-129, I-131, (I-133, Table II only), Pb-210, Po-210, At-211, Ra-228, Th-230, Pa-231, Th-232, Th-nat, Cm-248, Cf-254, and Fm-256 are not present	—	$3.3 \times 10^{+6}$	—	$1.1 \times 10^{+5}$
If it is known that Sr-90, I-125, I-126, I-129, (I-131, I-133, Table II only), Pb-210, Po-210, Ra-223, Ra-226, Ra-228, Pa-231, Th-nat, Cm-248, Cf-154, and Fm-256 are not present	—	$2.2 \times 10^{+6}$	—	$7.4 \times 10^{+4}$
If it is known that Sr-90, I-129, (I-125, I-126, I-131, Table II only), Pb-210, Ra-226, Ra-228, Cm-248, and Cf-254 are not present	—	$7.4 \times 10^{+5}$	—	$2.2 \times 10^{+4}$
If it is known that (I-129, Table II only), Ra-226, and Ra-228 are not present	—	$1.1 \times 10^{+5}$	—	$3.7 \times 10^{+3}$
If it is known that alpha-emitters and Sr-90, I-129, Pb-210, Ac-227, Ra-228, Pa-230, Pu-241, and Bk-249 are not present	$1.1 \times 10^{+2}$	—	3.7×10^{-0}	—
If it is known that alpha-emitters and Pb-210, Ac-227, Ra-228, and Pu-241 are not present	$1.1 \times 10^{+1}$	—	3.7×10^{-1}	—
If it is known that alpha-emitters and Ac-227 are not present	1.1×10^{-1}	—	3.7×10^{-2}	—
If it is known that Ac-227, Th-230, Pa-231, Pu-238, Pu-239, Pu-240, Pu-242, Pu-244, Cm-248, Cf-249 and Cf-251 are not present	1.1×10^{-1}	—	3.7×10^{-3}	—

4. If a mixture of radionuclides consists of uranium and its daughters in ore dust prior to chemical separation of the uranium from the ore, the values specified below may be used for uranium and its daughters through radium-226, instead of those from paragraph 1, 2 or 3 above.

    a. For purposes of Table I, Column 1, 3.7 becquerels per cubic metre gross alpha activity; or 1.8 becquerels per cubic metre natural uranium; or 75 micrograms per cubic metre of air natural uranium.

    b. For purposes of Table II, Column 1, 0.11 becquerels per cubic metre gross alpha activity; 7.4×10^{-2} becquerels per cubic metre natural uranium; or 3 micrograms per cubic metre of air natural uranium.

5. For purposes of this note, a radionuclide may be considered as not present in a mixture if (a) the ratio of the concentration of that radionuclide in the mixture C_a to the concentration limit for that radionuclide specified in Table II of this Appendix (MPC_a) does not exceed $^1/_{10}$, (i.e., $C_a/MPC_a \leq {}^1/_{10}$ and (b) the sum of such ratios for all radionuclides considered as not present in the mixture does not exceed ¼, (i.e., $C_a/MPC_a + C_b/MPC_b + \ldots\ldots \leq ¼$).

Schedule IX

[Regulation 36]

Conditions imposable on registration of irradiating apparatus

1. In the case of irradiating apparatus which is operated or used for dental radiography, including panoramic (tomographic) and cephalometric radiography —

    (a) the x-ray tube shall be enclosed in a housing in such a manner that the absorbed dose rate in air from leakage radiation measured at a distance of 1 metre from the focus of that x-ray tube does not exceed —

        (i) for apparatus used with intra-oral x-ray film, 0.25 milligray in 1 hour; and

        (ii) for other apparatus, 1 milligray in 1 hour,

    at every rating specified by the manufacturer for that tube in that housing and, to determine compliance with this condition, measurements may be averaged over an area not larger than 10 000 square mms at a distance of 1 metre from that tube; and

    (b) cones, diaphragms or collimators which serve to limit the useful beam shall be so constructed that, in combination with the x-ray tube housing, they comply with the leakage radiation limits set out in paragraph (a); and

    (c) the minimum power capability of apparatus —

        (i) used for —

            (A) dental radiography with intra-oral x-ray film; or

            (B) lateral oblique radiography of the mandible with extra-oral x-ray film,

        or both, shall be 60 kV(peak) at 7 milliamps for 3 seconds;

(ii) used for dental radiography with intra-oral x-ray film but also used for cephalometric or trans-cranial tempero-mandibular joint radiography, shall be 70 kV(peak) at 10 milliamps for 3 seconds;

and

(d) the selected —

(i) tube potential difference in kV(peak), the x-ray tube current in milliamps (mA) and the exposure time in seconds or fractions of a second; or

(ii) kV(peak) and the product of the tube current and exposure time (mAs),

shall be indicated by analogue metres, digital displays or scales, or calibrated permanent markings, but apparatus which provides for object programmed control (exposure selection by diagrammatic representations of the part to be examined) shall indicate the exposure time in seconds on the control panel; and

(e) when object programmed control exposure times can be modified by a further control which can be adjusted to account for variations in the speed of the film used —

(i) that control shall be provided with a tool for its adjustment; and

(ii) that control shall be clearly labelled to indicate its purpose; and

(iii) there shall be clearly indicated on or adjacent to that control the setting to be used with "D" speed intra-oral x-ray film;

and

(f) all conductors to the primary winding of the high voltage transformer shall be effectively inoperable when the exposure switch is in the OFF position and the failure of any component of the timing circuit or an earth fault shall not lead to the production of x-rays; and

(g) the useful x-ray beam shall incorporate filtration so that the half value layer of the useful x-ray beam for a given x-ray tube potential in kV(peak) is not less than the values given in the following table —

Table

Design Operating Range (kV(peak))	Measured Potential (kV(peak))	Half Value Layer (millimetres of aluminium)
60 to 70	60	1.5
	70	1.5
Above 70	71	2.1
	80	2.3
	90	2.5
	100	2.7
	110	3.0
	120	3.2
	130	3.5
	140	3.8
	150	4.1

and

(h) the exposure timer shall be electronic and the circuit of the apparatus shall be so designed that in the event of any component failure such failure is to a safe condition and does not lead to the x-ray tube becoming energized or continuing to be energized; and

(i) it shall not be possible to initiate an exposure without the exposure timer set to a nominated exposure time greater than zero (or to a projection in the case of an object programmed control) and the exposure control switch shall be protected against accidental operation; and

(j) the apparatus shall incorporate —

(i) a visual signal in the form of a yellow light which —

(A) is clearly visible; and

(B) is marked as to its function; and

(C) illuminates when the x-ray tube is energized;

and

(ii) an audible signal (discernible from sounds produced by switching devices or contactors during the exposure) which sounds for the duration of the exposure or at its termination,

and both the visual and audible signals shall be —

(iii) located at the control panel; or

(iv) in the case of remotely controlled equipment, where those signals could not otherwise be seen or heard, at the position of the operator;

and

(k) the exposure control switch shall be so arranged that the operator can remain well outside the useful x-ray beam and at least 2 metres from the x-ray tube and the patient during the exposure, but if this distance cannot be achieved and if the Council so requires, a protective barrier shall be provided; and

(l) where the exposure is initiated by an infra-red or wireless remote control handpiece, that handpiece shall —

(i) be encoded so that no other remote control handpiece can initiate exposures; and

(ii) be permanently labelled with a warning identifying the purpose of the handpiece; and

(iii) have provision at the control panel for its storage;

and

(m) the exposure control switch, including that for infra-red or wireless remote control handpieces, shall be "dead man" so that continuous pressure is necessary to maintain the x-ray exposure and it shall not be possible to make repeat exposures without releasing that switch; and

(n) it shall not be possible to initiate an exposure other than for a preset time interval, except in the case of apparatus equipped with an automatic exposure control device, in which case an overriding timer shall be provided to limit the total exposure time —

(i) in the case of apparatus used with intra-oral x-ray film for —

(A) lateral oblique examinations of the mandible; or

(B) cephalometric examinations,

to not more than 3 seconds; and

(ii) in the case of panoramic (tomographic) apparatus, to not more than 20 seconds;

and

(o) the accuracy of the timer shall ensure that —

(i) the measured exposure time is within plus or minus 10% for exposure times greater than or equal to 0.1 second and within plus or minus 20% for exposure times less than 0.1 second, with the exposure time in seconds determined —

(A) for single phase generators, by counting the total number of pulses in the radiation waveform and multiplying by a factor of 0.02 if half wave rectified or a factor of 0.01 if full wave rectified; and

(B) for other generators, from the time the radiation waveform first rises to 65-85% of the kV(peak) until the time at which it finally drops below this value of the final peak;

(ii) for any specified combination of selected exposure factors the coefficient of variation (as defined below) of radiation exposure does not exceed 0.05 and compliance with this requirement shall be based on 10 consecutive measurements taken within 60 minutes each with an exposure time of not less than 0.1 seconds.
Coefficient of variation (C) means the ratio of the standard deviation to the mean value of a series of measurements calculated as follows —

$$C = \frac{S}{\overline{X}} = \frac{1}{\overline{X}} \left[\frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{n - 1} \right]^{1/2}$$

Where —

X_i = ith measurement

$\overline{X}$ = mean value of measurements

S = estimated standard deviation

n = number of measurements;

and

(p) the current delivered to the x-ray tube shall be within plus or minus 15% of the indicated value; and

(q) where the tube current can be varied, then for any single value of the x-ray tube voltage in kV(peak) within the range specified for the apparatus, the average ratios of the dose in air (in milligray) to the product of the tube current and exposure time (as mAs) obtained at any 2 tube current

settings at the same focal spot size, shall not differ by more than 0.2 times their mean calculated as follows —

$$\left| \overline{K}_1 - \overline{K}_2 \right| \leq 0.2 \times \frac{\overline{K}_1 + \overline{K}_2}{2}$$

Where —

$\overline{K}_1$ and $\overline{K}_2$ = the average of 10 consecutive measurements of the ratios of the measured values of the dose in air to the mAs;

and

(r) the kilovoltage applied to the x-ray tube shall be within plus or minus 5% or plus or minus 5 kV(peak), whichever is the lesser, of the nominal or preset value averaged over the first 100 milliseconds of the exposure; and

(s) except for equipment used for panoramic (tomographic) radiography, the x-ray tube head shall remain stationary when placed in position for radiography; and

(t) where a light beam collimator is provided to define the shape and size of the useful x-ray beam —

(i) the illuminance of the light beam shall not be less than 100 lux at a distance of 1 metre from the focal spot of the x-ray tube or at the plane of the x-ray film, whichever is the lesser;

(ii) the contrast (as defined below) at the edge of the illuminated field at the distance referred to in subparagraph (i) shall not be less than 3;

contrast means the ratio of the illumination measured 3 mms from the edge of the field towards the centre of the field to the illumination measured 3 mms from the edge of the field away from the centre of the field, using a measuring aperture not greater than 1 mm;

(iii) the collimator shall be designed so that the irradiated area does not exceed the illuminated area under any conditions and the edges of the irradiated and

illuminated areas are coincident to within 10 mm at 100 cms;

(iv) the collimator shall be attached to the x-ray tube housing so that it cannot be detached without the use of tools;

and

(u) for apparatus intended for use with intra-oral x-ray film and which may also be used for lateral oblique examinations of the mandible, the cone, diaphragm or collimator referred to in paragraph (b) —

(i) shall limit the diameter of the useful beam at the end of that cone, diaphragm or collimator to a diameter not exceeding 60 mm or, if the x-ray beam is not circular, to a maximum diagonal dimension of 60 mm; and

(ii) shall be open ended and shall be so constructed that the minimum distance from the outer end to the x-ray tube focus is not less than 200 mm and the internal diameter is greater than the diameter of the useful beam at the outer end;

and

(v) for apparatus used for panoramic (tomographic) radiography, the cone, diaphragm or collimator referred to in paragraph (b) —

(i) shall provide a useful x-ray beam with dimensions not greater than the dimensions of the slot in the secondary collimator immediately adjacent to the x-ray film and that cone or diaphragm shall also restrict the vertical dimension of the useful beam so that it cannot exceed the height of the x-ray film (or its smallest dimension); and

(ii) in conjunction with the x-ray tube housing shall limit the distance between the x-ray tube focus and the patient's skin to not less than 150 mm;

and

(w) for apparatus used for cephalometric radiography —

(i) the cone, diaphragm or collimator referred to in paragraph (b) shall restrict the useful beam to the size of the x-ray film and shall not exceed —

(A) 180 x 240 mm or 180 mm in diameter for an x-ray film with dimensions of 180 mm x 240 mm; and

(B) 240 x 300 mm or 240 mm in diameter for an x-ray film with dimensions of 240 x 300 mm;

and

(ii) the x-ray tube and x-ray film shall be so arranged that the x-ray tube focus to film distance is not less than 1.5 metres and the minimum x-ray tube focus to the patient entrance surface is not less than 300 mms;

and

(x) where the apparatus is designed —

(i) exclusively for one of the purposes referred to in paragraph (u) or (v), the cone, diaphragm or collimator shall be attached to the x-ray tube housing so that it cannot be detached without the use of tools;

(ii) for more than one such purpose the cone, diaphragm, or collimator selected shall be interlocked so that the use of the apparatus is restricted only to the purpose appropriate to that cone, diaphragm or collimator;

and

(y) the x-ray tube assembly shall be marked with —

(i) the name of the supplier or manufacturer;

(ii) the type number of the x-ray tube or the x-ray tube assembly;

(iii) the nominal value of the inherent filtration of the x-ray tube assembly and, where appropriate, the value of any permanently added filtration including that provided by cones, diaphragms or collimators;

(iv) the position and nominal size of the focal spot or spots;

(v) the values of the x-ray tube potential in kV(peak) and the tube current where those values are fixed;

and

(z) intra-oral x-ray tubes shall not be used; and

(za) fluoroscopy shall not be used.

2. In the case of irradiating apparatus which is operated or used for diagnostic medical radiography —

(a) the x-ray tube shall be enclosed in a housing in such a manner that the absorbed dose rate measured in air from leakage radiation measured at a distance of 1 metre from the focus of that tube does not exceed 1 milligray in 1 hour at each rating specified by the manufacturer for that tube in that housing and, to determine compliance with this requirement, measurements shall be averaged over an area not larger than 10 000 sq mm at a distance of 1 metre from that tube;

(b) diaphragms, cones or collimators used to limit the useful beam to the area of clinical interest shall be so constructed that, in combination with the tube housing, they comply with the leakage radiation limits set out in paragraph (a);

(c) except in relation to irradiating apparatus or procedures specified in writing by the Council —

(i) a continuously adjustable multiplane rectangular collimator shall be fitted to the x-ray tube and that collimator shall, except in the case of examinations utilizing a serial changer in association with a fluoroscopic apparatus, be a light beam unit; and

(ii) the lack of alignment between any boundary of the light beam and the equivalent boundary of the x-ray beam in the plane of the image receptor shall not exceed 1% of the distance between the target of the x-ray tube and the plane of the image receptor; and

(iii) the illuminance of the light beam shall be not less than 100 lux at a distance of 1 metre from the light source; and

(iv) when provision is made for the automatic adjustment of the collimator referred to in subparagraph (i) to the size of the film in use, it shall be possible, at the discretion of the operator, to adjust that collimator to produce an x-ray beam smaller than the size of the film in use;

(d) when more than one x-ray tube can be operated from a single control panel, there shall, except in the case of the undertable and associated overtable x-ray tubes on fluoroscopic equipment, be an indication at or near the tube housing and on the control panel showing which x-ray tube is selected;

(e) when x-ray tube potential and current —

(i) are capable of being varied, control settings or meters shall be provided in the control panel referred to in paragraph (d) to indicate that potential and current; or

(ii) are not capable of being varied, the values of that potential and current shall be indicated on the control panel referred to in paragraph (d);

(f) filtration shall be added, when necessary, to the useful x-ray beam so that the half value layer of the beam for a given x-ray tube and collimator shall not be less than the values shown in the following table —

Table

Design operating range (kilovolts peak)	Measured potential (kilovolts peak)	Half value layer (millimetres of aluminium)
Below 50	30	0.3
	40	0.4
	49	0.5
50 to 70	50	1.2
	60	1.3
	70	1.5
Above 70	71	2.1
	80	2.3
	90	2.5
	100	2.7
	110	3.0
	120	3.2
	130	3.5
	140	3.8
	150	4.1

and either positive means shall be provided to ensure that at least the minimum filtration needed to achieve the beam quality specified in the above table is in the useful beam during each exposure or, failing that provision, the filtration shall be not less than is required to achieve the beam quality specified in the above table for the maximum x-ray tube potential at which the x-ray tube can operate with its associated control, and the Council may require permanent filtration in addition to the minimum filtration given above;

(g) the total filtration permanently in the useful beam as specified in paragraph (f) shall be indicated on the tube housing, or the separate components of that filtration shall be indicated on the tube housing and diaphragm;

(h) a device shall be provided to terminate the exposure after a preset time interval or exposure and, when an automatic exposure control is provided, that control shall limit the exposure time in such a manner that the product of x-ray tube current and exposure time per exposure does not exceed —

(i) 1 000 mAs; or

(ii) if the x-ray tube potential is less than 50 kVp, 2 000 mAs,

and, when an exposure has been terminated at the limits described in this paragraph, a visible or audible signal shall indicate that termination has occurred and that manual resetting is required before further automatically timed exposures can be made;

(i) when an automatic exposure control is used to terminate the exposure, the selection of that control shall, when it takes place, be visibly indicated on the control panel;

(j) the exposure switch shall —

(i) be designed so that it is protected against accidental operation; and

(ii) except in special circumstances specified by the Council, be so arranged that it cannot be operated outside a shielded area,

but this requirement does not apply to exposure switches used in conjunction with fluoroscopic equipment or to portable or mobile x-ray apparatus unless the Council otherwise directs in writing;

(k) the x-ray tube head shall, except in tomography and other procedures in which it is a requirement that the x-ray tube head move in a predetermined manner, be supported in such a way that it remains stationary when placed in position for radiography;

(l) "Inverted T" collimation shall be provided for full spine radiography to enable the x-ray beam to be confined to the spinal column and the pelvic bones;

(m) the aluminium equivalent of each of the items listed in the following table which are used between the patient and image receptor shall not exceed the limits indicated in that table and compliance with this requirement shall be determined by x-ray measurements made at a potential of 100 kilovolts peak and with an x-ray beam which has a half-value layer of 2.7 millimetres of aluminium, but this requirement does not apply to such items as a fluorescent screen and its associated mechanical support panel or grids —

Table

Item	Aluminium equivalent (millimetres)
Front panel(s) of cassette holder (total of all)	1.0
Front panel(s) of film changer (total of all)	1.0
Stationary tabletop	1.0
Movable tabletop (including stationary subtop)	1.5
Cradle	2.0

(n) involving portable or mobile x-ray apparatus —

(i) paragraphs (a), (b), (c), (e), (f), (g), (h) and (k) apply to that apparatus, except that the continuously adjustable rectangular collimator referred to in paragraph (c) need not be multi-plane; and

(ii) a cable not less than 2 metres in length shall be provided for the exposure control switch of that apparatus so that the operator thereof can remain outside the x-ray beam at least 2 metres from the x-ray tube and from the patient; and

(iii) the equipment shall be so arranged that an x-ray tube focus to film distance of at least 750 mm may be utilized for medical radiography; and

(iv) that apparatus shall have a minimum x-ray exposure capability of 85 kVp at 20 milliamperes for 2 seconds;

(o) involving photo fluorography —

(i) high efficiency optical systems shall be used; and

(ii) when there is a fixed relationship between the x-ray tube and the photo fluorographic camera, a fixed diaphragm is provided which limits the x-ray beam to dimensions no larger than those of the fluorescent screen and the equipment is designed for one image size only, it shall not be necessary for a continuously adjustable rectangular light beam diaphragm to be provided; and

(iii) when a light beam diaphragm is provided, it shall not be possible for the dimensions of the x-ray beam to exceed those of the fluorescent screen;

(p) involving equipment in which the x-ray tube is energised by a capacitor energy storage system (capacitor discharge x-ray equipment), radiation emitted from the x-ray tube when the exposure switch or timer is not activated shall not exceed 20 microsieverts per hour at 50 mm from any accessible surface of the x-ray tube or associated diaphragm or collimator with the collimator fully open and, to determine compliance with this requirement, measurements shall be averaged over an area not exceeding 10 000 square mm with no linear dimension greater than 200 mm and the response time of the measuring instrument shall not be less than 3, nor greater than 20, seconds.

3. In addition to the requirements specified in item 2, in the case of irradiating apparatus that is operated or used for medical or veterinary fluoroscopy —

(a) the irradiating apparatus shall, for the purpose of viewing fluoroscopic images, always be used in conjunction with an electronic image intensifier;

(b) the irradiating apparatus shall be so constructed that the entire cross-section of the useful x-ray beam is always intercepted by a primary protective barrier irrespective of the source to image receptor distance;

(c) the useful x-ray beam shall automatically terminate when that barrier is removed from the useful x-ray beam;

(d) the primary protective barrier, which includes the electronic image intensifier and adjacent mounting components subject to exposure to the useful x-ray beam, shall have a lead equivalence not less than —

(i) 1.5 mm for maximum operating potentials less than or equal to 70 kV(peak);

(ii) 2.0 mm for maximum operating potentials greater than 70 kV(peak) and less than or equal to 100 kV(peak);

(iii) 2.0 mm for maximum operating potentials greater than 100 kV(peak) plus 0.01 mm for each kV(peak) above 100 kV(peak),

and this lead equivalence shall also apply to radiographic exposures made using the fluoroscopic tube and the associated serial spot film device;

(e) for mobile fluoroscopic apparatus —

(i) the fluoroscopic x-ray beam at the image intensifier input shall be limited by a collimator to a circle or square whose diameter or diagonal respectively is no greater than the diameter of the image intensifier input;

(ii) if the user can select a different field size or x-ray tube focus to image intensifier input distance, the collimator shall automatically adjust to comply with these limits;

(iii) the size of the x-ray beam at the image intensifier input shall in no case be greater than the area imaged on the television display;

(iv) the radiographic x-ray beam shall be limited by a collimator to a size no greater than the image receptor selected and, if the collimation is circular, to a circle whose diameter is no greater than the smallest linear dimension of the image receptor;

(v) where a range of discrete radiographic beam sizes can be selected, indication shall be provided on the control panel of the irradiating apparatus to show which beam size has been selected;

(vi) if the beam size can be varied continuously, the collimation shall automatically adjust so as not to be greater than the image receptor size selected;

(f) for other fluoroscopic apparatus —

(i) the fluoroscopic x-ray beam at the image intensifier input shall be limited automatically by a collimator to a circle or square whose diameter or diagonal respectively is no greater than the diameter of the image intensifier input regardless of the effective field size or tube focus to image intensifier input distance selected;

(ii) the size of the x-ray beam at the image intensifier input shall in no case be greater than the area imaged on the television display;

(iii) the radiographic x-ray beam shall be limited automatically by a collimator to a size no greater than the image receptor selected and if the collimation is circular, to a circle whose diameter is no greater than the smallest linear dimension of the image receptor;

(iv) where the apparatus can be used without an intervening tabletop or where the image intensifier is fixed beneath the table (overtable tube fluoroscopy), the x-ray beam shall be defined by a light beam collimator that complies with the requirements of item 2(c);

(g) for apparatus where the image intensifier is fixed beneath the tabletop (overtable tube fluoroscopy), control of the fluoroscopic procedure shall be made from a location remote from the table and this location shall be shielded as directed by the Council;

(h) the minimum distance between the x-ray tube focal spot and the patient support or the patient's skin, depending on the apparatus configuration, shall be as specified in the following Table —

Table

Apparatus Configuration	Patient Support	Minimum Distance
Undertable x-ray tube	Permanently between the x-ray tube and patient	400 mms between the x-ray tube focal spot and the patient support
Overtable x-ray tube	Permanently between the image intensifier and patient	700 mms between the x-ray tube focal spot and the patient support
Mobile C-arm apparatus	May or may not be permanently in the useful x-ray beam	200 mms between the x-ray tube focal spot and the patient's skin
Other fluoroscopic apparatus	May or may not be permanently in the useful x-ray beam	700 mms between the x-ray tube focal spot and the input surface of the image intensifier

(i) except where it cannot reasonably be avoided, no person shall operate mobile fluoroscopic apparatus in such a manner that the distance between the x-ray tube focus and the patient entrance surface is less than 300 mms;

(j) a timing device shall be provided to indicate the elapsed fluoroscopic exposure time and an audible signal requiring manual resetting shall provide a warning to the fluoroscopist at intervals not exceeding 5 minutes and provision shall be

made for the display to be set to zero for each patient but resetting of the alarm need not necessarily also reset the timer to zero;

(k) subject to paragraphs (l) and (m), the maximum absorbed dose rate in air for the apparatus configurations specified in the following Table at the measurement points and under the conditions specified in that Table shall not exceed 50 milligray per minute —

Table

Apparatus Configuration	Patient Support	Measurement Point	Other Conditions
Undertable x-ray tube	Permanently between the x-ray tube and patient	10 mms from the patient support on the patient side of the support	Shortest distance between the x-ray tube focal spot and patient
Overtable x-ray tube	Permanently between the image intensifier and patient	300 mms above the patient support on the x-ray tube side of the support	Shortest distance between the x-ray tube focal spot and patient
C-arm or U-arm apparatus where the x-ray tube and image intensifier are mechanically linked	May or may not be permanently in the useful x-ray beam	300 mms from the input surface of the image intensifier	Shortest distance between the x-ray tube focal spot and the image intensifier but not less than 400 mms from the x-ray tube focal spot
Other fluoroscopic apparatus	May or may not be permanently in the useful x-ray beam	400 mms from the x-ray tube focal spot or the minimum distance, whichever is greater	

(l) notwithstanding paragraph (k), where the apparatus is fitted with automatic dose rate control and a higher dose rate is temporarily required, a maximum dose rate in air of 100 milligray per minute is permitted for the apparatus configurations specified in the Table to paragraph (k) at the measurement points and under the conditions specified in that Table, subject to the higher dose rate facility —

(i) being activated by a clearly identified control requiring a deliberate action by the fluoroscopist; and

(ii) being accompanied during activation by —

(A) a continuous signal audible to the fluoroscopist and distinguishable from the signal required under paragraph (j); or

(B) an identified and readily distinguishable visible signal at the image viewing position occupied by the fluoroscopist;

and

(iii) automatically returning to the lower dose rate setting if the higher dose rate facility is —

(A) not activated by a "dead man" switch; and

(B) unused for 5 minutes or more or otherwise disconnected from the power source;

(m) paragraph (k) does not apply during pulsed cinefluorography or electronic radiography;

(n) for apparatus with automatic dose rate control, or at 90 kV(peak) for apparatus with semi-automatic dose rate control, the dose rate in air measured under the conditions specified in the Table to paragraph (k) with the x-ray beam attenuated by a methyl methacrylate and aluminium abdominal phantom, as defined in American National Standards Institute publication ANSI PH2.43-1982, item 3.1, shall not exceed 15 milligray per minute;

(o) the apparatus shall provide either an analogue or digital display to indicate both the fluoroscopic x-ray tube voltage and the fluoroscopic current whenever the x-ray tube is energized;

(p) the fluoroscopic exposure switch shall be "dead man" and foot switches shall be protected against accidental activation;

(q) for conventional undertable x-ray tube fluoroscopic apparatus —

(i) an apron or drape consisting of overlapping segments and providing shielding equivalent to not less than 0.5 mm of lead shall be attached to the edge of the serial changer in such a way that there is no gap between the drape and the serial changer or between the segments when the drape hangs vertically and unobstructed;

(ii) the apron or drape shall not be smaller in width than the width of the serial changer measured parallel to the table length and shall be long enough to reach the tabletop with the table horizontal and the serial changer at its maximum height above the table;

(iii) any bucky slot opening in the side of the table adjacent to the person performing fluoroscopy shall be covered during fluoroscopy with a barrier equivalent to not less than 0.5 mm lead.

4. In the case of x-ray therapy apparatus which is operated or used for medical therapy and in which the x-rays produced have a maximum energy not exceeding 500 000 electron volts —

(a) an x-ray tube used for conventional x-ray therapy shall be enclosed in such a housing that, at every specified rating of that tube in that housing, the absorbed dose rate in air from the leakage radiation measured —

(i) at a distance of 1 metre from the focus does not exceed 10 milligrays per hour, or 300 milligrays per hour at any position accessible to the patient at a distance of 50 mm from the surface of that housing or its accessory equipment; or

(ii) in the case of an x-ray tube which is operated at a potential of 60 kilovolts peak or below, does not exceed 1 milligray per hour at any position 50 mm

from the surface of that housing or its accessory equipment,

and for the purpose of determining compliance with this requirement, measurements shall be averaged over an area not exceeding 10 000 square mm at a distance of 1 metre or 1 000 square mm at a distance of 50 mm, as the case requires, from the x-ray tube or source housing;

(b) the high tension generator shall be —

(i) so designed that it maintains the tube potential and current within plus or minus 2% of the preset values; and

(ii) provided with —

(A) a meter to indicate a deviation from the preset values of the tube potential or current; or

(B) a visual or audible indicator to react if the tube potential or current transgresses the preset values;

(ba) electronic circuits shall be provided to identify the choice and location of interchangeable filters;

(bc) where a choice of interchangeable filters can be made by an operation within the treatment room —

(i) exposure shall not be capable of being made until the choice has been verified by a confirming operation at the control panel; and

(ii) when the confirming operation has been completed, the chosen filter combination shall be displayed at the control panel;

(c) permanent diaphragms or cones shall be so constructed that, in combination with the x-ray tube housing, they comply with the exposure requirements for leakage radiation set out in paragraph (a);

(d) adjustable or removable beam limiting diaphragms or cones shall not transmit more than 5% of the useful beam at the maximum operating kilovoltage and with the maximum treatment filter in position;

(e) the x-ray tube shall be so secured in its housing that it cannot move in relation to the useful beam aperture and there shall be a clear mark on the exterior of the x-ray tube housing to indicate the position of the focal spot;

(f) the x-ray tube housing shall remain stationary during stationary portal treatment;

(g) there shall be a clearly visible indicator on the control panel which indicates when x-rays are being produced;

(h) equipment in which the useful beam is controlled by a shutter shall have clearly visible indicators on the control panel which indicate whether the shutter is open or closed;

(i) an indicator light shall be provided near the entrance to the treatment room to indicate when the useful beam is being transmitted;

(j) the equipment shall be so designed that —

(i) the full operating tube potential and current are attained within a period of time such that the skin dose to the patient does not exceed 50 milligrays during that time; or

(ii) the tube assembly carries a remotely operated shutter to control the useful beam so that the skin dose to the patient does not exceed 50 milligrays during the period of time it takes for the shutter to open;

(k) subject to paragraph (q), the equipment shall be provided with 2 automatic timers, comprising a primary timer and a back-up timer;

(l) the timers referred to in paragraph (k) shall be so designed and arranged that —

(i) the failure of one timer does not affect the operation of the other timer; and

(ii) the possibility of accidental communication between the timers is minimised; and

(iii) the failure of the main power supply to either timer will terminate the exposure; and

(iv) each timer is capable of terminating the exposure independently of the other timer; and

(v) the 2 terminating circuits are kept physically separated; and

(vi) each timer counts upwards from zero so that an over exposure will give a reading; and

(vii) the primary timer terminates the exposure when the preset time for termination of the exposure is reached; and

(viii) the back-up timer terminates the exposure after, but not more than 0.1 minutes after, the preset time for termination of exposure on the primary timer; and

(ix) each timer continues to record and display until the exposure is terminated by whatever means and retains the display of its readings on and after termination; and

(x) in the event of a power failure, readings displayed at the time of that failure are stored in a retrievable form; and

(xi) a single preselection of the exposure time presets both timers; and

(xii) the displays of the timers are positioned closely together on the control panel, identical in form and easy to read; and

(xiii) the timers are single scaled in minutes and decimals of minutes or in seconds only and are capable of being read without further calculation;

(m) there shall be a clearly visible or audible indicator on the control panel which is activated when the exposure is terminated otherwise than by the primary timer referred to in paragraph (k);

(n) subject to paragraph (o), the electronic circuits of the equipment shall be so designed that after each exposure —

(i) the tripping mechanism of the back-up timer is checked; and

(ii) the setting of each timer is returned to zero,

by the operator of the equipment before a new exposure can be made;

(o) the procedures referred to in paragraph (n) may be carried out automatically if the equipment is provided with timers that produce a permanent printout or chart record;

(p) equipment which can operate at tube potentials exceeding 150 kilovolts peak shall be provided with a transmission monitoring ionisation chamber or equivalent device positioned in the useful beam to provide a continuous check on the constancy of the radiation output;

(q) the chamber referred to in paragraph (p) may be used as an integrating dose meter to control treatment dose in the place of the primary timer referred to in paragraph (k) and where that chamber is so used —

(i) the integrating dose meter shall terminate the exposure by switching off the high tension or closing the shutter when the preset dose for the treatment is reached; and

(ii) the equipment shall be provided with a back-up timer so designed and arranged that it —

(A) is capable of terminating the exposure independently of the integrating dose meter; and

(B) terminates the exposure after the expiry of a period of time that exceeds the period of time estimated for the treatment by not more than 10% of that estimated period of time;

and

(iii) the integrating dose meter and the back-up timer shall count upwards from zero so that an over exposure will give a reading; and

(iv) the integrating dose meter and the back-up timer shall continue to record and display until the exposure is terminated by whatever means and shall retain the display of their readings on and after termination.

5. In the case of irradiating apparatus which is operated or used for veterinary radiography —

(a) the requirements specified in item 2 in relation to the use in diagnostic medical radiography of fixed and mobile equipment, other than the requirements set out in paragraphs (c) and (n)(iv) of that item, shall apply to that irradiating apparatus;

(b) sheet lead at least 1 mm thick shall, when an x-ray table is used for radiography, be provided in the top of that table or, if a bucky is fitted, below the bucky tray, so as to intercept the x-ray beam fully, but this requirement may be waived by the Council in writing in respect of approved special procedures;

(c) the film or cassette shall, whenever radiography with an angulated or horizontal beam is necessary, be supported by mechanical means;

(d) such devices for restraining and immobilising animals for radiography as the Council directs in writing shall be provided.

6. In the case of x-ray equipment which is used for industrial radiography and in which x-rays are produced by the direct application of a high voltage to the x-ray tube, that tube shall be enclosed in a housing in such a manner that the exposure from leakage radiation measured at a distance of 1 metre from that tube does not exceed 10 milligrays per hour at every specified rating of that tube in the housing.

7. Cabinet x-ray apparatus shall comply with the specifications relating to cabinet x-ray equipment set out in the publication entitled "Revised statement on cabinet x-ray equipment for the examination of letters, packages, baggage, freight and other articles for security and related purposes" approved by the NHMRC at its 85th session in June 1978.

8. X-ray analysis equipment shall comply with —

(a) the requirements for equipment used for x-ray analysis set out in the NHMRC publication entitled "Code of Practice for Protection against Ionizing Radiation emitted from X-ray Analysis Equipment 1984"; or

(b) if that equipment is of such a kind that the requirements of the publication referred to in paragraph (a) cannot readily be complied with, such requirements as the Council specifies in writing in relation to that equipment for the purpose of achieving a level of safety equivalent to that attained by compliance with the requirements of that publication.

9. In the case of x-ray equipment used by chiropractors for radiography of human beings the requirements specified in this Schedule for fixed medical diagnostic x-ray apparatus must be met.

[Schedule IX amended: Gazette 15 Mar 1991 p. 1127-9; 28 May 1993 p. 2588-94; 11 Jun 1993 p. 2873-7; 4 Feb 1994 p. 341; 22 Jul 1997 p. 3824.]

Schedule X

[Regulation 37]

Requirements to be complied with in respect of premises in which irradiating apparatus is operated or used

1. In the case of any premises in which there is x-ray analysis equipment, the registrant shall —

   (a) provide approved safety devices and safety equipment; and

   (b) ensure that the devices and equipment referred to in paragraph (a) and the x-ray analysis equipment are installed and located in those premises,

   in accordance with the requirements set out in the NHMRC publication entitled "Code of Practice for Protection against Ionizing Radiation emitted from X-ray Analysis Equipment 1984".

2. (1) Subject to subitem (2), in the case of any premises in which there is medical radiographic equipment, the person in whose name those premises are registered shall ensure that —

   (a) the control apparatus for that equipment is located —

   (i) in a room separate from the room in which that equipment is installed but adjacent thereto; or

   (ii) behind a fixed screen, situated within the room in which that equipment is installed and composed of radiation shielding material to a height of not less than 2 metres and arranged so that the radiation emitted by that equipment is scattered twice before it enters the area behind that screen occupied by the operator of that control apparatus;

   and

(b) the operator of the control apparatus referred to in paragraph (a) is able to see the patient —

(i) by means of closed circuit television or a mirror; or

(ii) through a lead glass window, the lead equivalence of which —

A. if that window is situated in a protective screen constructed to accommodate that screen, is not less than that of that screen; or

B. if that window is situated in a structural wall, is not less than that of the radiation protection design requirement for that wall,

and is in either case clearly and durably marked on that window, together with the peak kilovoltage of the x-ray beam with which that equivalent was measured;

and

(c) the operator referred to in paragraph (b) is able to communicate with the patient concerned from a shielded position; and

(d) a protective apron and protective gloves with a shielding value of not less than 0.25 mm lead equivalent are provided for the use of the operator referred to in paragraph (b); and

(e) protective devices with a shielding value of not less than 0.5 mm lead equivalent are provided for shielding the reproductive organs of patients; and

(f) any room in those premises used for fluoroscopy by the direct viewing of a fluoroscopic screen is free of any extraneous light which may interfere with observation of the fluoroscopic image.

(2) The person in whose name premises referred to in subitem (1) are registered need not comply with the requirements set out in paragraphs (a), (b) and (c) of that subitem in respect of rooms in which mobile or portable x-ray apparatus is used unless the Council otherwise directs in writing.

3. In the case of premises in which there is medical therapeutic irradiating apparatus —

(a) which can operate at voltages above 150 kilovolts peak, the person in whose name those premises are registered shall ensure that —

(i) the control panel for that irradiating apparatus is located outside the treatment room; and

(ii) safety interlocks are provided for that irradiating apparatus so that when any door to the treatment room is opened —

A. that irradiating apparatus automatically ceases to operate; or

B. the radiation level within the treatment room is reduced to an average of not more than 20 microsieverts per hour and to a maximum of 100 microsieverts per hour at a distance of 1 metre in any direction from the source of radiation,

whereupon that irradiating apparatus can only be restored to full operation at the control panel for that irradiating apparatus;

and

(b) the person in whose name those premises are registered shall ensure that —

(i) there are, in addition to any safety interlocks referred to in paragraph (a)(ii), warning lights to indicate the production of x-rays adjacent to all doors to the treatment room which are not visible to the operator of that irradiating apparatus when located at the control panel for that irradiating apparatus; and

(ii) shielded windows, mirrors or closed circuit television systems are provided to permit continuous observation of the patient during treatment and are so located that the operator of that apparatus is able to see both the patient and the control panel for that irradiating apparatus from the same position; and

(iii) provision is made for oral communication with the patient.

4. In the case of premises in which there is chiropractic radiographic equipment, the person in whose name those premises are registered shall ensure that the requirements of item 2 are complied with in respect of that apparatus.

[Schedule X amended: Gazette 22 Jul 1997 p. 3824-5.]

Schedule XI

[Regulation 38]

Requirements to be complied with in respect of operation or use of irradiating apparatus

1. In the case of irradiating apparatus operated or used for dental radiography —

    (a) a person other than the patient shall not hold the x-ray film during its exposure to x-rays; and

    (b) a person other than the patient shall not be in the x-ray beam emitted by that irradiating apparatus; and

    (c) a person shall not touch the cone, diaphragm or x-ray tube housing of that irradiating apparatus during exposure; and

    (d) a person other than a person whose presence is essential to the radiographic procedure concerned or for the care of the patient, as the case requires, shall not be in the radiographic room during an exposure; and

    (e) a person shall not use for intra-oral dental radiography any x-ray film which has a sensitivity less than that of films defined as Speed Group D films by the publication known as American National Standard ANSI PHG.1. 1970 issued by the American National Standards Institute; and

    (f) facilities shall be provided to enable the x-ray film taken by that irradiating apparatus to be processed in the manner specified by the manufacturer of that film and —

        (i) for other than dry to dry automatic film processors, those facilities shall include —

            (A) a non-mercury thermometer with the scale marked at least every 1°C or a digital thermometer accurate to plus or minus 0.2°C;

(B) a timer to measure the elapsed developing time which can be set to within plus or minus 15 seconds of the required time prior to development;

(C) a time-temperature graph for the developer in use which indicates the appropriate developing time according to the temperature of the developer;

(ii) for self-contained processing systems that do not necessarily require a darkroom, those facilities —

(A) shall have inherent design and construction features which exclude all extraneous light; and any viewing window into a self-contained system shall provide illumination appropriate to the x-ray film in use and shall not visibly increase the density of the x-ray film if exposed to that light for a period equal to twice the normal handling time; and

(B) where self-contained processing systems are not specifically designed to process x-ray films other than intra-oral x-ray films, shall not be used for processing other than intra-oral x-ray films;

(iii) for the processing of panoramic, cephalometric, or lateral oblique radiographs of the mandible, the person in whose name premises are registered shall comply with the requirements of the publication entitled "Code of Practice for the Use of Panoramic (Tomographic) X-Ray Equipment" issued by the Council in December 1984;

(iv) where a darkroom is required, those facilities shall include a room that is —

(A) light tight; and

(B) illuminated by a safe light appropriate to the x-ray film being developed and that light shall be installed in a location where the illumination will not visibly increase the density of the x-ray film if exposed to that light for a period equal to twice the normal handling time;

and

(g) where the person in whose name premises are registered intends using a developer and film processing techniques other than those specified by the manufacturer for the x-ray film or films in use, that person shall provide data in a form acceptable to the Council which proves that the use of that developer and those techniques do not have the effect of lowering the speed of the x-ray film when compared with the developer and techniques specified by the manufacturer.

2. (1) In the case of irradiating apparatus operated or used for medical radiography or fluoroscopy —

(a) a person who holds a patient during the exposure to x-rays of the patient —

(i) shall wear a protective apron and protective gloves with a shielding value of not less than 0.25 mm lead equivalent; and

(ii) shall not expose any part of his body which is not protected by the apron and gloves referred to in subparagraph (i) to the useful x-ray beam;

and

(b) if a patient is being exposed to x-rays in a room where x-ray apparatus is installed, a person other than the patient shall not during that exposure remain in that room unless —

(i) that person remains behind a protective screen or is wearing a protective apron and —

A. his presence during the radiographic procedure concerned is necessary; or

B. he is a medical practitioner responsible for the care of the patient; or

C. he is receiving instruction from a person responsible for the conduct of the radiographic procedure concerned;

or

(ii) that room has been surveyed by a qualified expert and that person remains in such parts of that room for such periods as the qualified expert designates as safe;

and

(c) protective devices with a shielding value of not less than 0.5 mm lead equivalent shall, during radiographic procedures in which the reproductive organs of patients of reproductive age would otherwise be exposed to the useful x-ray beam, be used for shielding those organs, except when that shielding would interfere with the diagnostic procedure.

(2) In the case of irradiating apparatus operated or used for medical x-ray fluoroscopy —

(a) a fluoroscopist shall wear a protective apron and, if his hands are exposed to the direct x-ray beam, protective gloves with a shielding value of not less than 0.25 mm lead equivalent during an x-ray examination unless he is shielded by a protective screen; and

(b) persons other than the fluoroscopist referred to in paragraph (a) present in the fluoroscopic room during the radiographic procedure concerned shall wear protective aprons with a shielding value of not less than 0.25 mm lead equivalent, unless a qualified expert considers it unnecessary for them to do so.

3. In the case of irradiating apparatus operated or used for medical therapeutic irradiation —

   (a) the radiation emitted by that irradiating apparatus shall —

      (i) be calibrated by an approved person before it is operated or used for treating human beings; and

      (ii) be recalibrated by an approved person at intervals not exceeding 3 months and a copy of the re-calibration data shall be forwarded to the Council;

   and

   (b) at voltages —

      (i) above 150 kilovolts peak a person other than the patient shall not remain in; and

      (ii) at or below 150 kilovolts peak a person other than the patient shall not remain in an unshielded area of,

   the treatment room during the treatment of the patient.

4. In the case of irradiating apparatus operated or used for chiropractic radiography, a person shall not so operate or use that irradiating apparatus unless he is a licensee who is a chiropractor or is a qualified medical radiographer acting under the direction and supervision of such a licensee.

5. In the case of irradiating apparatus operated or used for x-ray analysis, that operation or use shall be in accordance with the requirements of the NHMRC publication entitled "Code of Practice for Protection against Ionizing Radiation emitted from X-ray Analysis Equipment 1984".

6. In the case of irradiating apparatus operated or used for industrial radiography —

   (a) a licensee may carry out that radiography in either closed or open installations;

   (b) a person shall not remain in or enter a closed or open installation during an x-ray exposure;

(c) the person in charge of that operation or use shall —

(i) before an open installation is employed for that radiography, ensure that adequate protection is provided; and

(ii) during an x-ray exposure ensure that an open installation is kept under continuous surveillance and that, if any person not authorised by him enters that installation, the x-ray exposure is terminated.

7. In the case of irradiating apparatus operated or used for veterinary radiography —

(a) whenever it is necessary to employ an angulated or horizontal beam, the film or cassette shall be supported by mechanical means; and

(b) a person shall not be regularly employed to hold or support animal patients or film during x-ray exposures; and

(c) subject to paragraph (d), mechanical restraining or supporting devices shall be employed if it is necessary for an animal patient to be held in position during x-ray exposures; and

(d) a person who, for clinical reasons, holds an animal patient during an x-ray exposure shall —

(i) wear a protective apron with a shielding value of not less than 0.25 mm lead equivalent and protective gloves with a shielding value of not less than 0.25 mm lead equivalent; and

(ii) keep all parts of his body which are not protected by the apron and gloves referred to in subparagraph (i) out of the useful x-ray beam;

and

(e) a person under the age of 18 years shall not hold or support an animal patient during x-ray exposures; and

(f) a person shall not hold in his hand the x-ray film or the x-ray tube and attached cone or diaphragm of that irradiating apparatus during an x-ray exposure.

[Schedule XI amended: Gazette 15 Mar 1991 p. 1129; 28 May 1993 p. 2594-5; 22 Jul 1997 p. 3825.]

[Schedule XII deleted: Gazette 22 Jul 1997 p. 3825.]

Schedule XIII

[Regulation 54]

Requirements to be complied with in respect of premises in which regulated class 3B lasers are operated or used

[Heading amended: Gazette 15 Oct 1996 p. 5451.]

1. Such beam stops, beam enlarging systems, shutters or other safety devices as the Council from time to time directs shall be incorporated in the laser or its system.

2. The beam of the laser shall be —

   (a) contained within enclosures; or

   (b) terminated at the end of the useful beam path by a beam trap or, in the case of a laser which is an infrared laser, by a highly absorbent backstop.

3. In the case of a laser which is an ultraviolet laser, such special precautions as the Council from time to time directs for reducing radiation or preventing undesirable chemical reactions shall be taken.

4. Any optical system used for viewing in connection with the laser shall be provided with an interlock or filter to reduce ocular irradiation to a safe level.

5. The laser or its laser system shall be provided with a master switch which, when a key, magnetic card, cipher combination or other similar device is removed therefrom, makes it impossible to operate or use the laser or its laser system.

6. Labels shall be affixed to the laser or to the protective housing of its laser system in accordance with the requirements of the laser safety standard.

7. Approved instructions shall be issued to all persons operating or using the laser.

8. Persons, other than persons authorised by the person in whose name the premises concerned are registered to operate or use the laser or its laser system, shall not operate or use the laser or its laser system.

9. Whenever persons operating or using the laser or its laser system are exposed to potentially hazardous laser radiation, those persons shall be provided with protective eye-wear in accordance with Section 10.8 of the laser safety standard.

10. The laser or its laser system shall be operated or used only in a controlled area.

11. Bench and wall surfaces in the controlled area referred to in item 10 shall be painted with matt paints of approved colours so that those surfaces are not highly reflective to the radiation of the laser.

12. Areas which are exposed to reflections from an infrared laser or its laser system shall be protected by screening the beam or target area concerned with infrared absorbent material.

13. The illuminance level in the controlled area referred to in item 10 shall, unless the Council otherwise directs, be not less than 350 lux.

14. Persons other than those operating or using the laser or its laser system shall not enter the controlled area referred to in item 10 unless they have the permission of the person in whose name the premises concerned are registered to do so and take such protective measures as he directs.

15. There shall be displayed —

(a) in conspicuous locations inside and outside the controlled area referred to in item 10; and

(b) at all entrances giving access to the controlled area; and

(c) in a prominent position near the laser,

area warning signs in accordance with Section 10.5 of the laser safety standard.

16. Persons operating or using the laser system are to undergo eye examinations in accordance with section 10.11 of the laser safety standard.

[Schedule XIII amended: Gazette 10 Oct 1986 p. 3846; 15 Oct 1996 p. 5451; 17 Aug 2010 p. 4048.]

Schedule XIV

[Regulation 55]

Requirements to be complied with in respect of premises in which class 4 lasers are operated or used

1. The entire beam path of the laser shall be enclosed and that enclosure shall be equipped with interlocks in accordance with Section 4.3 of the laser safety standard in order to prevent the operation or use of the laser if that enclosure is not properly installed.

2. The laser or its laser system shall be provided with a master switch which, when a key, magnetic card, cipher combination or other similar device is removed makes it impossible to operate the laser or its laser system.

3. The beam of the laser or its laser system shall be terminated in an absorbent fire resistant material, which shall be inspected periodically for signs of deterioration.

4. If the laser or its laser system is operated or used without its entire beam path and interaction site enclosed, that operation or use shall take place in a controlled area which is permanently isolated from other areas within the premises concerned.

5. Except in medical laser installations, safety latches or interlocks designed —

   (a) to prevent uncontrolled entry into; and

   (b) to enable rapid exit from; and

   (c) to enable rapid entry in an emergency into,

   the controlled area referred to in item 4 shall be installed.

6. It shall be possible temporarily to override entrance safety switches to permit persons to operate or use the laser or its laser system whilst that operation or use is continuous.

7. In the case of a pulsed laser, power supplies thereto shall be as far therefrom as possible.

8. In industrial laser installations, the laser or its laser system shall be —

   (a) operated or used; and

   (b) monitored by means of closed circuit television or through a viewing window of approved design,

   from a position outside the controlled area referred to in item 4.

9. A control switch shall be situated in the controlled area referred to in item 4 for the purpose of switching off the laser in the event of an emergency.

10. Surfaces within the controlled area referred to in item 4 must be rendered non-reflective by means of approved materials to reduce the possibility of hazardous diffuse reflections.

11. In the case of an infrared laser, surfaces within the controlled area referred to in item 4 which are exposed to reflections from that laser shall be protected by screening with approved fire-resistant material close to the reflecting source of that laser.

[12, 13. deleted]

14. Approved ear protection shall be provided for persons operating or using the laser during noisy applications thereof.

15. The requirements of Part IV shall be complied with in respect of any ionising radiation produced by the laser.

16. High pressure arc lamps and filament lamps in the laser or its laser system shall be enclosed in housings capable of withstanding the maximum explosive pressures resulting from the disintegration of those lamps.

17. The target of the laser and elements of its optical train which are liable to shatter during the operation or use of the laser shall be enclosed in housings or otherwise protected to prevent injury as a result of any such shattering to persons operating, using or observing the laser.

18. Approved shielding shall be provided in respect of ultraviolet, visible and infrared collateral radiation from a laser discharge tube, optical pump source or other part of the laser or its laser system.

[19. deleted]

20. The illuminance level in the controlled area referred to in item 4 shall be not less than 350 lux at all working sites during the operation or use of the laser.

21. An alarm system, consisting of lights visible through protective eyewear, shall be used to give warning of the operation or use of the laser.

22. Area warning signs complying with Section 10.5 of the laser safety standard shall be displayed at the entrance to the controlled area referred to in item 4.

23. All persons having access to the controlled area referred to in item 4 shall be authorised to do so by or on behalf of the person in whose name the premises concerned are registered.

24. Persons operating or using the laser system are to undergo eye examinations in accordance with section 10.11 of the laser safety standard.

[Schedule XIV amended: Gazette 10 Oct 1986 p. 3846; 15 Oct 1996 p. 5452; 17 Aug 2010 p. 4048; 20 Sep 2016 p. 3968; 7 Mar 2017 p. 1527.]

Schedule 15 — Fees

[r. 58]

[Heading inserted: SL 2026/121 r. 22.]

Division 1 — Registration and licences

[Heading inserted: SL 2026/121 r. 22.]

		$	
		Annual	**Triennial**
1.	Fee for registration or renewal of registration of premises (other than premises used solely for the mining and milling of radioactive ores (including mineral sands)), for the manufacture, use or storage of radioactive substances (r. 58(1))		
	Maximum quantity:		
	40 gigabecquerels	330	660
	400 gigabecquerels	660	1 320
	4 terabecquerels	1 320	2 640
	Exceeding 4 terabecquerels	2 090	4 180
2.	Fee for registration or renewal of registration of premises used solely for the mining and milling of radioactive ores (including mineral sands) (r. 58(1aa))	330	660
3.	Fee for registration or renewal of registration of premises for the sale or service of radioactive substances, irradiating apparatus or electronic products (r. 58(1a))	330	660

		$	
		Annual	**Triennial**
4.	Fee for registration or renewal of registration of premises (other than premises referred to in items 1 to 3), irradiating apparatus or electronic products (r. 58(2))		
	In the case of —		
	(a) not more than 2 irradiating apparatus or electronic products	330	660
	(b) more than 2 but not more than 5 irradiating apparatus or electronic products	660	1 320
	(c) more than 5 but not more than 10 irradiating apparatus or electronic products	1 320	2 640
	(d) more than 10 irradiating apparatus or electronic products	2 090	4 180
5.	Licence fee (r. 58(3))		
	In the case of —		
	(a) irradiating apparatus or electronic products	130	260
	(b) radioactive substances	130	260

[Division 1 inserted: SL 2026/121 r. 22.]

Division 2 — Temporary permits

[Heading inserted: SL 2026/121 r. 22.]

Fee for temporary permits for periods not exceeding 3 months.

		$
1.	In respect of premises (other than premises used solely for the mining and milling of	

		$
	radioactive ores (including mineral sands)) and radioactive substances (r. 58(7))	
	Maximum quantity:	
	40 gigabecquerels	140
	400 gigabecquerels	280
	4 terabecquerels	560
	Exceeding 4 terabecquerels	860
2.	In respect of premises used solely for the mining and milling of radioactive ores (including mineral sands) (r. 58(7a))	140
3.	In respect of premises (other than premises referred to in items 1 and 2), irradiating apparatus or electronic products (r. 58(8)) with —	
	(a) not more than 2 irradiating apparatus or electronic products	140
	(b) more than 2 but not more than 5 irradiating apparatus or electronic products	280
	(c) more than 5 but not more than 10 irradiating apparatus or electronic products	560
	(d) more than 10 irradiating apparatus or electronic products	860
4.	For persons to operate, use, manufacture, store, transport, sell, possess, install, service, maintain, repair or otherwise deal with (r. 58(9)) —	
	(a) radioactive substances	60

		$
(b)	irradiating apparatus or electronic products	60

[Division 2 inserted: SL 2026/121 r. 22.]

Division 3 — Records

[Heading inserted: SL 2026/121 r. 22.]

1.	Fee for copy of records (per page) (r. 58(4))	2

[Division 3 inserted: SL 2026/121 r. 22.]

Schedule XVI

[Heading inserted: Gazette 4 Mar 1994 p. 837.]

[Regulation 28(3)(d)]

1. In this Schedule —

equipment means cobalt teletherapy equipment;

treatment room means a room where the radiation source for any equipment is housed.

2. (1) The treatment room shall have approved structural shielding so that the effective dose any person (other than a patient receiving treatment) is exposed to does not exceed the appropriate effective dose limit.

(2) The structural shielding referred to in subitem (1) shall be —

(a) approved by the Council and a qualified expert before the construction of the treatment room; and

(b) reviewed by a qualified expert before any structural alteration to the treatment room or any modification to the equipment.

3. A radiation survey shall be carried out by a qualified expert to ensure that the shielding referred to in item 2(1) is as approved —

(a) immediately after the equipment is installed and before any patient is treated; and

(b) immediately after any structural alteration to the treatment room or any modification to the equipment.

4. The entrance to the treatment room shall be clearly and permanently labelled with a sign of not less than 15 cm x 15 cm stating "CAUTION — RADIATION" and containing the radiation warning symbol.

5. It shall be possible from outside the treatment room, to observe and converse with a patient who is inside the treatment room.

6. When the radiation beam is in use, a signal shall indicate this clearly to persons inside the treatment room and persons about to enter the treatment room.

7. The radiation source shall be fitted with a source control mechanism so that —

   (a) if any door or other barrier (such as a light beam) to the treatment room is opened or interrupted, the equipment shall automatically and immediately switch off; and

   (b) the equipment cannot be activated until all barriers to the treatment room are closed; and

   (c) after the equipment has switched off, as referred to in paragraph (a), it can only be reactivated manually.

8. Only the person receiving treatment shall be in the treatment room while the radiation beam is in use.

9. No person shall enter the treatment room other than as necessary for treatment, for operation or maintenance of the equipment or for other essential activities.

10. A qualified expert shall —

   (a) be responsible for ensuring the correct operation and calibration of the equipment in accordance with the "Revised code of practice for dosimetry of 2 to 25 MV x-rays, and of caesium-137 and cobalt-60 gamma ray beams" (Physics in Medicine and Biology 1983, Vol. 28, No. 10, pp.1097-1104) or other approved international protocol; and

   (b) verify radiation field sizes relevant to radiation beam data at intervals not exceeding 4 weeks.

11. Emergency procedures to be followed in the event of the failure of the source control mechanism shall be established, approved and posted at the treatment control panel.

12. It shall be possible to lock mechanically the source control mechanism in the "safe" position during maintenance.

13. (1) A permanent radiation monitor shall be installed in the treatment room for continuous monitoring of the radiation beam status.

   (2) The permanent radiation monitor shall provide a visual signal —

   (a) inside the treatment room; and

(b) near the entrance outside the treatment room.

(3) The permanent radiation monitor shall have the capacity to provide an audible signal inside the treatment room and this signal shall be used when maintenance or calibration of the equipment is in progress.

14. A permanent radiation monitor used in association with the equipment shall —

(a) provide visible warning of a malfunction that may result in an exposed or partly exposed radiation source; and

(b) provide a warning of high radiation levels which is visible to a person in, or about to enter, the treatment room; and

(c) have an emergency power supply (i.e. a battery system) which is separate from the power supply to the equipment; and

(d) be tested to ensure that it is operating correctly each day before the equipment is used for treatment.

15. (1) A portable radiation survey monitor shall be available on the premises where the treatment room is located and shall be used if any malfunction occurs that may result in an exposed or partly exposed radiation source.

(2) The portable radiation survey monitor referred to in subitem (1) shall be calibrated by an approved calibration facility at intervals not exceeding 12 months.

16. The equipment shall be inspected and serviced by an approved person to ensure that the radiation source control mechanism is functioning properly —

(a) during replacement of the radiation source; and

(b) at intervals not exceeding 3 months.

17. The protective source housing for the equipment shall be —

(a) constructed so that, measured in accordance with item 18 —

(i) when the radiation beam is off, the maximum dose rate in air at 1 metre from the radiation source does

not exceed 0.1 milligray per hour and the average dose rate in air does not exceed 0.02 milligray per hour; and

(ii) when the radiation beam is on, the maximum dose rate in air at 1 metre from the radiation source does not exceed 0.1% of the useful beam exposure rate at 1 metre or 10 milligray per hour, whichever is the greater;

and

(b) such that the integrity of the protective source housing shielding is preserved in the event of fire.

18. (1) When the radiation beam is off, the maximum dose rate in air shall be measured at 26 points defined by a sphere 1 metre in radius centred on the radiation source of which —

(a) 2 points shall be located at the poles of the sphere and 4 equally spaced points shall be located on the sphere's equator; and

(b) 8 points shall be located at the centres of the spherical triangles formed by connecting the first 6 points; and

(c) 12 points shall be located at points midway between the first 6 points.

(2) The average maximum dose rate of the 26 points referred to in subitem (1) shall not exceed 0.02 milligray per hour and no point shall exceed 0.1 milligray per hour.

(3) When the radiation beam is on, the maximum dose rate in air shall be measured with the beam defining diaphragms closed as far as possible and, if the useful beam aperture is not completely intercepted at that position, the entire useful beam shall be blocked by lead which has an attenuation equivalent to that of the equipment source housing.

19. (1) The radiation source housing, including the radiation beam aperture and other locations likely to be contaminated in the event of a

leakage, shall be tested when the radiation beam is off for leakage of radioactive material —

(a) immediately after the installation of the equipment; and

(b) at intervals not exceeding 12 months; and

(c) immediately before any maintenance work is carried out in the housing port or collimator assembly.

(2) No maintenance work shall be carried out in the housing port or collimator assembly until the contamination test described in subitem (1) is completed.

20. If the contamination test described in item 19(1) indicates the presence of free activity of more than 2 000 Bq, the radiation source shall be considered to be leaking and —

(a) arrangements shall be made for immediate repair to be carried out; and

(b) the Council shall be notified in writing immediately.

21. Beam collimation shall be carried out using permanent cones or diaphragms which —

(a) do not transmit more than 2% of the useful beam; and

(b) comply with the leakage radiation limits set out in item 17(a).

22. Where a diaphragm is used for beam collimation —

(a) the diaphragm shall include a light beam providing illumination of not less than 100 lux at a distance of 1 metre from the light source; or

(b) the treatment area shall be indicated by a laser alignment system.

23. When the radiation source is in the "on" position and at the usual treatment distance (i.e. source to skin distance or source to isocentre distance), the mechanical axis defining the axis of rotation of the collimating device shall be accurately aligned to within 2 mm of the central axis of the radiation beam for all orientations of the treatment head.

24. The equipment shall have a remotely operated source control mechanism which —

(a) can function in any orientation of the source housing; and

(b) automatically and immediately switches the equipment off —

(i) at the predetermined end of the exposure; or

(ii) if there is a breakdown or interruption of the activating force;

and

(c) ensures that the equipment remains switched off, as referred to in paragraph (b), until it is reactivated manually.

25. (1) The equipment and source control mechanism shall be located so that in an emergency the equipment can be turned off with the minimum possible exposure to any person.

(2) Any tools required for turning the equipment off manually shall be mounted in a position near the treatment room entrance that is easily visible and accessible.

26. The source housing and the treatment control panel shall each have a warning device that plainly indicates whether the radiation beam is "on" or "off" and whether the source or shutter is "in transit".

27. (1) The equipment shall have —

(a) an automatic timer, or an integrated dosemeter, which terminates the treatment after a pre-set time or dose; and

(b) a back-up timer which is independent of the timer referred to in paragraph (a).

(2) The timers referred to in subitem (1) shall be arranged so that —

(a) the failure of one timer does not affect the other timer; and

(b) the possibility of accidental communication between the timers is minimized; and

(c) each timer is capable of terminating the radiation exposure by means independent of the other timer; and

(d) the terminating electrical circuits of the 2 timers are kept physically separate; and

(e) each timer counts up from zero so that an over-exposure will give a reading; and

(f) information from the timers is retrievable, including after a power failure; and

(g) the stopping and starting of the timers is controlled by switches activated by the source or shutter so that in the event of failure of the terminating means, a true record of maximum exposure time is obtained; and

(h) the switch controlling the timer referred to in subitem (1)(a) shall operate when the source or shutter —

(i) arrives at; and

(ii) leaves,

the fully "on" position;

and

(i) the switch controlling the back-up timer referred to in subitem (1)(b) shall operate when the source or shutter —

(i) arrives at; and

(ii) leaves,

a position where the source is just shielded; and

(j) the back-up timer referred to in subitem (1)(b) shall terminate the radiation exposure at a time not more than 6 seconds after the termination time for the treatment pre-set on the timer referred to in subitem (1)(a).

(3) The electrical circuits of the equipment shall be arranged so that —

(a) after each radiation exposure, the tripping mechanism of the back-up timer referred to in subitem (1)(b) must be manually checked and the settings and readings of both timers must be manually returned to zero; and

(b) it is not possible to set or commence radiation exposure until the sequence referred to in paragraph (a) has been completed.

(4) If treatment is terminated by an event other than the operation of the timer referred to in subitem (1)(a), the equipment shall give or show a signal which clearly indicates this.

28. (1) It shall be impossible for the source control mechanism to be switched on from inside the treatment room.

(2) The source control mechanism shall have a locking device so that it cannot be operated by any unauthorised person.

29. (1) The equipment shall be arranged so that the selection of the mode of treatment and the selection and correct location of wedge filters are identified electrically.

(2) Radiation exposure shall be impossible until the selection made in the treatment room of the mode of treatment and wedge filter has been manually verified at the treatment control panel.

(3) After the verification referred to in subitem (2), the selected mode of treatment and wedge filter shall be displayed on the treatment control panel.

30. (1) A beam stop, or counterweight, on the equipment shall not transmit more than 0.1% of the useful beam.

(2) The equipment shall be arranged so that —

(a) the relationship between the useful beam and a beam stop is permanently fixed; or

(b) it has mechanical or electrical stops to ensure that the beam is directed only towards barriers for which useful beam shielding has been provided.

[Schedule XVI inserted: Gazette 4 Mar 1994 p. 837-41; (correction: Gazette 11 Mar 1994 p. 960); amended: Gazette 22 Jul 1997 p. 3825.]

Notes

This is a compilation of the *Radiation Safety (General) Regulations 1983* and includes amendments made by other written laws. For provisions that have come into operation, and for information about any reprints, see the compilation table.

Compilation table

Citation	Published	Commencement
Radiation Safety (General) Regulations 1983	21 Feb 1983 p. 555-636	21 Aug 1983 (see r. 2)
Health Legislation Amendment Regulations 1984 r. 4	29 Jun 1984 p. 1780-4	1 Jul 1984 (see r. 2)
Radiation Safety (General) Amendment Regulations 1986	10 Oct 1986 p. 3844-6	10 Oct 1986
Radiation Safety (General) Amendment Regulations (No. 2) 1986	5 Dec 1986 p. 4467-8	5 Dec 1986
Radiation Safety (General) Amendment Regulations 1987	26 Jun 1987 p. 2461-2	1 Jul 1987 (see r. 2)
Radiation Safety (General) Amendment Regulations 1988	1 Jul 1988 p. 2143	1 Jul 1988 (see r. 2)
Radiation Safety (General) Amendment Regulations 1989	20 Oct 1989 p. 3842	20 Oct 1989
Radiation Safety (General) Amendment Regulations (No. 2) 1990	20 Jul 1990 p. 3464-6	20 Jul 1990
Radiation Safety (General) Amendment Regulations (No. 3) 1990	4 Sep 1990 p. 4617	4 Sep 1990
Radiation Safety (General) Amendment Regulations 1991	15 Mar 1991 p. 1127-9	15 Mar 1991
Radiation Safety (General) Amendment Regulations (No. 5) 1991	28 Jun 1991 p. 3147-8	1 Jul 1991 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 6) 1991	6 Sep 1991 p. 4631-2	6 Sep 1991
Radiation Safety (General) Amendment Regulations (No. 2) 1991	29 Nov 1991 p. 5988-90	1 Jan 1992 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 7) 1991	24 Jan 1992 p. 368	24 Jan 1992
Radiation Safety (General) Amendment Regulations (No. 2) 1992	26 Jun 1992 p. 2697-9	1 Jul 1992 (see r. 2)

Citation	Published	Commencement
Radiation Safety (General) Amendment Regulations (No. 3) 1992	7 Aug 1992 p. 3856-9	7 Aug 1992
Radiation Safety (General) Amendment Regulations (No. 4) 1993	4 May 1993 p. 2299-2300	4 Jul 1993 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 3) 1993	4 May 1993 p. 2300-1	4 May 1993
Radiation Safety (General) Amendment Regulations 1993	28 May 1993 p. 2588-95	28 May 1993
Radiation Safety (General) Amendment Regulations (No. 2) 1993	11 Jun 1993 p. 2870-7	11 Jun 1993
Radiation Safety (General) Amendment Regulations (No. 5) 1993	9 Jul 1993 p. 3331-3	9 Jul 1993
Radiation Safety (General) Amendment Regulations (No. 6) 1993	28 Jan 1994 p. 281-3	28 Jan 1994
Radiation Safety (General) Amendment Regulations 1994	4 Feb 1994 p. 341	4 Feb 1994
Radiation Safety (General) Amendment Regulations (No. 2) 1994	4 Mar 1994 p. 837-41 (correction 11 Mar 1994 p. 960)	4 Mar 1994
Radiation Safety (General) Amendment Regulations (No. 3) 1994	27 May 1994 p. 2212-14	1 Jul 1994 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 4) 1994	11 Nov 1994 p. 5694-6	11 Nov 1994
Radiation Safety (General) Amendment Regulations 1995	17 Mar 1995 p. 1027	17 Mar 1995
Reprint of the *Radiation Safety (General) Regulations 1983* as at 4 Apr 1995 (includes amendments listed above)		
Radiation Safety (General) Amendment Regulations (No. 2) 1995	27 Jun 1995 p. 2546-9	1 Jul 1995 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 3) 1995	25 Aug 1995 p. 3847-8	25 Aug 1995
Radiation Safety (General) Amendment Regulations (No. 2) 1996	28 Jun 1996 p. 3021-4	1 Jul 1996 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 5) 1996	15 Oct 1996 p. 5448-52	15 Oct 1996

Citation	Published	Commencement
Radiation Safety (General) Amendment Regulations 1997	22 Jul 1997 p. 3813-26	22 Jul 1997
Radiation Safety (General) Amendment Regulations (No. 2) 1997	19 Aug 1997 p. 4720-2	19 Aug 1997
Radiation Safety (General) Amendment Regulations (No. 3) 1997	11 Nov 1997 p. 6209-14 (as amended 10 Feb 1998 p. 733)	11 Feb 1998 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 2) 1998	10 Feb 1998 p. 733	1 Jul 1998 (see r. 2)
Radiation Safety (General) Amendment Regulations 1999	30 Jun 1999 p. 2875-6	1 Jul 1999 (see r. 2)
Radiation Safety (General) Amendment Regulations (No. 2) 1999 [4]	31 Dec 1999 p. 7060-4	31 Dec 1999
Radiation Safety (General) Amendment Regulations 2000	29 Feb 2000 p. 991-2	29 Feb 2000
Reprint of the *Radiation Safety (General) Regulations 1983* as at 24 Mar 2000 (includes amendments listed above)		
Radiation Safety (General) Amendment Regulations 2001 [5]	25 Sep 2001 p. 5286-7	25 Sep 2001
Radiation Safety (General) Amendment Regulations 2002	26 Mar 2002 p. 1746-7	26 Mar 2002 (see r. 2 and *Gazette* 26 Mar 2002 p. 1744)
Radiation Safety (General) Amendment Regulations (No. 2) 2002	16 Jul 2002 p. 3399-400	16 Jul 2002
Radiation Safety (General) Amendment Regulations 2003	2 Jan 2004 p. 3	2 Jan 2004
Radiation Safety (General) Amendment Regulations 2008	2 Sep 2008 p. 4117-20	r. 1 and 2: 2 Sep 2008 (see r. 2(a)); Regulations other than r. 1 and 2: 3 Sep 2008 (see r. 2(b))
Reprint 3: The *Radiation Safety (General) Regulations 1983* as at 19 Dec 2008 (includes amendments listed above)		
Radiation Safety (General) Amendment Regulations 2010	17 Aug 2010 p. 4045-8	r. 1 and 2: 17 Aug 2010 (see r. 2(a)); Regulations other than r. 1 and 2: 18 Aug 2010 (see r. 2(b))

Citation	Published	Commencement
Radiation Safety (General) Amendment Regulations 2011	1 Apr 2011 p. 1183-4	r. 1 and 2: 1 Apr 2011 (see r. 2(a)); Regulations other than r. 1 and 2: 2 Apr 2011 (see r. 2(b))
Radiation Safety (General) Amendment Regulations 2014	30 Dec 2014 p. 5501-3	r. 1 and 2: 30 Dec 2014 (see r. 2(a)); Regulations other than r. 1 and 2: 31 Dec 2014 (see r. 2(b))
Radiation Safety (General) Amendment Regulations 2015	19 May 2015 p. 1754-7	r. 1 and 2: 19 May 2015 (see r. 2(a)); Regulations other than r. 1 and 2: 1 Jul 2015 (see r. 2(b))
Radiation Safety (General) Amendment Regulations (No. 2) 2015	9 Oct 2015 p. 3982	r. 1 and 2: 9 Oct 2015 (see r. 2(a)); Regulations other than r. 1 and 2: 1 Jan 2016 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2016 Pt. 6	17 Jun 2016 p. 2101-5	1 Jul 2016 (see r. 2(b))
Radiation Safety (General) Amendment Regulations 2016	20 Sep 2016 p. 3967-8	r. 1 and 2: 20 Sep 2016 (see r. 2(a)); Regulations other than r. 1 and 2: 21 Sep 2016 (see r. 2(b))
Health Regulations Amendment (Public Health) Regulations 2016 Pt. 31	10 Jan 2017 p. 237-308	24 Jan 2017 (see r. 2(b) and *Gazette* 10 Jan 2017 p. 165)
Radiation Safety (General) Amendment Regulations 2017	7 Mar 2017 p. 1526-7	r. 1 and 2: 7 Mar 2017 (see r. 2(a)); Regulations other than r. 1 and 2: 8 Mar 2017 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2017 Pt. 9	30 Jun 2017 p. 3568-74	1 Jul 2017 (see r. 2(b))
Reprint 4: The *Radiation Safety (General) Regulations 1983* as at 4 Aug 2017 (includes amendments listed above)		
Health Regulations Amendment (Fees and Charges) Regulations 2018 Pt. 9	25 May 2018 p. 1632-9	1 Jul 2018 (see r. 2(b))
Radiation Safety (General) Amendment Regulations 2018	16 Oct 2018 p. 4094	r. 1 and 2: 16 Oct 2018 (see r. 2(a)); Regulations other than r. 1 and 2: 17 Oct 2018 (see r. 2(b))

Citation	Published	Commencement
Health Regulations Amendment (Fees and Charges) Regulations 2019 Pt. 9	14 Jun 2019 p. 1883-94	1 Jul 2019 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2020 Pt. 6	SL 2020/97 26 Jun 2020	1 Jul 2020 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2021 Pt. 6	SL 2021/108 29 Jun 2021	1 Jul 2021 (see r. 2(b))
Radiation Safety (General) Amendment Regulations 2022	SL 2022/33 11 Mar 2022	r. 1 and 2: 11 Mar 2022 (see r. 2(a)); Regulations other than r. 1 and 2: 31 Mar 2022 (see r. 2(b) and SL 2022/18 cl. 2)
Health Regulations Amendment (Veterinary Practice) Regulations 2022 Pt. 3	SL 2022/93 17 Jun 2022	18 Jun 2022 (see r. 2(b) and SL 2022/81 cl. 2)
Health Regulations Amendment (Fees and Charges) Regulations 2022 Pt. 9	SL 2022/136 15 Jul 2022	16 Jul 2022 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2023 Pt. 9	SL 2023/96 30 Jun 2023	1 Jul 2023 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2024 Pt. 9	SL 2024/91 12 Jun 2024	1 Jul 2024 (see r. 2(b))
Health Regulations Amendment (Firearms) Regulations 2024 Pt. 3	SL 2024/297 21 Dec 2024	31 Mar 2025 (see r. 2(b) and SL 2024/289 cl. 2)
Health Regulations Amendment (Fees and Charges) Regulations 2025 Pt. 9	SL 2025/104 25 Jun 2025	1 Jul 2025 (see r. 2(b))
Health Regulations Amendment (Fees and Charges) Regulations 2026 Pt. 10	SL 2026/121 24 Jun 2026	1 Jul 2026 (see r. 2(b))

Other notes

[1] Footnote no longer applicable.

[2] The Standards Association of Australia has changed its corporate status and its name. It is now Standards Australia International Limited (ACN 087 326 690). It also trades as Standards Australia.

[3] Under the *Alteration of Statutory Designations Order (No. 3) 2001* a reference in any law to the Health Department of Western Australia is read and construed as a reference to the Department of Health.

[4] The *Radiation Safety (General) Amendment Regulations (No. 2) 1999* r. 8(2) and (3) are transitional provisions that are of no further effect.

5 The *Radiation Safety (General) Amendment Regulations 2001* r. 4(3) reads as follows:

> (3) Until the council approves a dental ancillary qualification under regulation 38(1)(c) and (d) of the *Radiation Safety (General) Regulations 1983* as amended by this regulation, all dental ancillary qualifications are taken to be approved dental ancillary qualifications for the purposes of that regulation.

Defined terms

[This is a list of terms defined and the provisions where they are defined. The list is not part of the law.]

Defined term	Provision(s)
absorbed dose	3(1)
approved	3(1)
average output power	52(1)
becquerel	3(1)
chest screening	3(1)
chiropractor	3(1)
class 1 laser	3(1)
class 2 laser	3(1)
class 3B laser	3(1)
class 3R laser	3(1)
class 4 laser	3(1)
Code	28(1)
code of practice	31A(1)
compliance test	40(2)
condition	3(1)
contrast	Sch. IX
controlled area	52(1)
cooling curve	3(1)
dentist	3(1)
designated radiation worker	3(1)
disposal facility	31A(1)
disposal permit	3(1)
disposal site	31A(1)
ECD substance	7C(1)
effective dose	3(1)
effective dose limit	3(1)
electron capture detector	7C(1)
equipment	Sch. XVI
equivalent dose	3(1)
equivalent dose limit	3(1)
exemption	3(1)
field site	3(1)
filtration	3(1)
fluoroscopy	3(1)
form	3(1)
general supervision	3(1)
gray	3(1)
half value layer	3(1)
image receptor	3(1)

industrial radiographer ..... 3(1)
ionisation ..... 3(1)
ionising radiation ..... 3(1)
ion mobility spectrometer ..... 7D(1)
irradiating apparatus ..... 6(1), 6(3), 6(4)
item ..... 3(1)
keep ..... 3(1)
laser ..... 3(1)
laser pointer ..... 53B(4)
laser safety standard ..... 3(1)
laser system ..... 52(1)
leakage radiation ..... 3(1)
licence ..... 3(1)
licence card ..... 3(1)
licensed ..... 3(1)
licensee ..... 3(1)
low powered irradiating apparatus ..... 3(1)
lux ..... 3(1)
mammography screening ..... 3(1)
maximum permissible exposure level ..... 3(1)
medical practitioner ..... 3(1)
microwave oven ..... 3(1)
microwave oven standard ..... 3(1)
month of discharge ..... 31(5)
near-surface disposal ..... 31A(1)
NHMRC ..... 3(1)
non-ionising radiation ..... 3(1)
nuclide ..... 3(1)
one half life of the radioactive substance ..... 12(3)
other radiation regulations ..... 4(1)
owner ..... Sch. II
permit ..... 3(1)
personal file ..... 3(1)
personal monitoring device ..... 3(1)
personal supervision ..... 3(1)
person at risk ..... 33(5)
physiotherapist ..... 3(1)
plain radiography ..... 3(1)
podiatrist ..... 3(1)
premises ..... 3(1)
publication ..... 3(1)
qualified expert ..... 3(1)
quality factor ..... 3(1)
radiation ..... 3(1)

radiation oncologist ..... 3(1)
radiation safety committee ..... 3(1)
radiation safety officer ..... 3(1)
radiation therapist ..... 3(1)
radiation warning symbol ..... 3(1)
radiation weighting factor ..... 3(1)
radiation worker ..... 3(1)
radioactive material ..... 3(1)
radioactive substance ..... 5(1)
radiographer ..... 3(1)
radiologist ..... 3(1)
registered ..... 3(1)
registrant ..... 3(1)
regulated class 3B laser ..... 52(1)
relevant contents ..... 11(5)
repaired ..... 19A(4)
responsible person ..... 15(1)
sealed source ..... 3(1)
section ..... 3(1)
sievert ..... 3(1)
smoke detector ..... 7B(1)
sun-tanning unit ..... 3(1)
temporary permit ..... 3(1)
tissue weighting factor ..... 3(1)
to be exposed ..... 33(2)
transilluminator ..... 3(1)
treatment room ..... Sch. XVI
user ..... 5(7)
veterinary surgeon ..... 3(1)
x-ray operator ..... 3(1)
x-rays ..... 3(1)

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