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RADIATION SAFETY ACT 1975

RADIATION SAFETY (GENERAL) AMENDMENT REGULATIONS (NO. 2) 1993

Made by His Excellency the Governor in Executive Council.

Citation

1. These regulations may be cited as the *Radiation Safety (General) Amendment Regulations (No. 2) 1993*.

Principal regulations

2. In these regulations the *Radiation Safety (General) Regulations 1983** are referred to as the principal regulations.

[* *Published in the Gazette of 21 February 1983 at pp. 555-636. For amendments to 22 April 1993 see 1991 Index to Legislation of Western Australia, p. 460 and Gazettes of 24 January, 26 June and 7 August 1992.*]

Regulation 3 amended

3. Regulation 3 of the principal regulations is amended by inserting in the appropriate alphabetical positions the following definitions —

" **"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 dose equivalent limits specified in Schedule I; ";

" **"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; ";

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

" **"qualified expert"** means expert whose qualifications are approved; ";

" **"registrant"** means person in whose name premises are registered; ".

Regulation 11 amended

4. Regulation 11 of the principal regulations is amended by inserting after subregulation (3) the following subregulation —

" (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. ".

Regulation 23 amended

5. Regulation 23 of the principal regulations is amended by repealing subregulation (6).

Regulation 25 repealed and regulations substituted

6. Regulation 25 of the principal regulations is repealed and the following regulations are substituted —

" **Personal monitoring devices**

25. (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 ionizing 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;

(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 dose equivalent received by the worker and the dose equivalent estimated shall be presumed, unless the contrary is proved, to be the dose equivalent 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.

Radiation monitoring organizations

25A. (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 authorize direct communication between a radiation monitoring organization and officers authorized by the Council if such direct communication is necessary to facilitate inquiries into a known or suspected radiation dose. ".

Regulation 36 amended

7. Regulation 36 of the principal regulations is amended —

(a) by inserting after the regulation designation "**36.**" the subregulation designation "(1)"; and

(b) by inserting the following subregulation —

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

Schedule IX amended

8. Schedule IX to the principal regulations is amended by deleting item 3 and substituting the following item —

" 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;

(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. ".

By His Excellency's Command,

D. G. BLIGHT, Clerk of the Council.