Department of Health and Human Services
Population Health

Radiation Protection Act 2005 – Section 17

CERTIFICATE OF COMPLIANCE:

STANDARD FOR RADIATION PLACE

FOR RADIATION APPARATUS: X-RAY

SECTION 1: REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR PLACES WHERE RADIATION APPARATUS IS TO BE USED AND/OR STORED

SECTION 2: COMPLIANCE REQUIREMENTS: PLACE - RADIATION APPARATUS X-RAY

This information can also be accessed at
http://www.dhhs.tas.gov.au/peh/radiation_protection

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Section 1 – REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR PLACES WHERE RADIATION APPARATUS IS TO BE USED AND/OR STORED.

This Standard is to be used when assessing a place where the following radiation apparatus is to be usually or primarily used and/or stored:
Radiation Apparatus, classified on Radiation Protection Act 2005 licences as "X-ray".

A "place" is defined in the Radiation Protection Act 2005 as including "vacant land, premises and a vehicle".

"premises" is further defined as including

(a) a building or structure; and
(b) land on which a building or structure is situated; and
(c) a part of any such building, structure or land.

"vehicle" is defined as meaning anything used for transporting any thing or person by land, water or air.

In order for a certificate of compliance to be issued the Place must be shown to fully comply with the requirements in Section 2.

Section 2 – Compliance requirements: Place - Radiation Apparatus X-ray

1. General

1.1 Protection of people from radiation exposure when the apparatus is in use

- The place must be designed with sufficient shielding that no member of the public would receive a radiation dose of more than 20 microsieverts in any four-week period due to the use of the radiation apparatus in that place. This includes areas on the same floor level as the room in which the radiation apparatus - x-ray is located and on levels above and below this room, if applicable.

  Occupancy factors (NCRP report 147[1]) may be taken into account when assessing compliance with this criterion.

[1] NCRP Report No. 147 "Structural shielding design for medical x-ray imaging facilities" 2004, published by the National Council on Radiation Protection and Measurement, Bethesda, Maryland

1.2 Warning signs

- All entrances to individual rooms or areas where a radiation apparatus - x-ray is to be usually or primarily used must bear a radiation warning sign. This sign must consist of a trefoil, in black on a yellow background, with an appropriate warning. Signs must be in compliance with the requirements of Australian Standard AS 1319-1994 *Safety signs for the occupational environment*.

- For mobile x-ray equipment, temporary signs must be situated within the vicinity of the x-ray unit whilst it is in use to ensure that radiography is not interrupted and that members of the public are not exposed to the primary beam or to radiation levels above 20 microsieverts in any four-week period due to the operation of the radiation apparatus in that place.

- No warning sign is required if a unit is solely to be stored in a place and not used but the place must be secure against theft or unauthorized use of the source.

1.3 Spatial requirements

- The room in which the radiation apparatus - x-ray is to be used must be designed so that the operator may stand at least two meters from the tube head or behind a protective barrier that provides equivalent protection from all sources of radiation.

2. Additional, specific requirements for:

2.1 Dental diagnostic

The exposure switch must be positioned so that it can be clearly identified as belonging to a specific x-ray tube and must be protected from inadvertent operation. For example, the exposure switch may be in the room with the x-ray unit and thus in view of the dental practitioner. If an exposure switch is outside the room in which the x-ray tube is located, then the x-ray unit should have a key lock or similar device to ensure that an exposure may be made only when the operator intends this to occur.

2.2 Medical diagnostic

The operator of the x-ray unit must be able to view and to communicate with the patient at all times during the x-ray procedure.

2.3 Animal diagnostic

No additional requirements.

2.4 Non-medical industry or research

If the radiation apparatus is to be used for industrial radiography, the place must comply with sections 6.1 (fully enclosed site) or 6.2 (partially enclosed site) or 6.3 (open site), as appropriate, of the *Code of Practice for the safe use of industrial radiography equipment (1989)* published by the NHMRC under the *National Health*

and Medical Research Council Act 1992 of the Commonwealth, as in force immediately before its rescission by the NHMRC.

2.5 Medical therapy

Additional requirements for a treatment room in which a linear accelerator is used

2.5.1 Illuminated radiation warning signs for treatment rooms containing linear accelerators

The entrance to the treatment room must have:
(a) a radiation warning sign, which illuminates *green* when the apparatus is in the ready state. This must contain words that indicate imminent radiation exposure (e.g. 'ready'); and
(b) a radiation warning sign that illuminates *yellow* when the apparatus is in the beam-on state. This must contain words that indicate radiation exposure (e.g. 'beam-on').

Within the treatment room, radiation-warning devices must be activated when the apparatus is in the ready state and beam-on state. Visible devices must contain words to indicate the state of the apparatus and both must be illuminated red.

The radiation warning devices must be fail-safe (i.e. turn the beam off if a device fails), or adequate warning that a device has failed must be indicated, at the control panel, in a clear and unambiguous manner.

2.5.2 Interlocks

Each door required for radiation shielding must be interlocked to ensure that the exposure cannot be made if the door is open. The entrance to the treatment room must have an interlock. The breaking of an interlock during an exposure must automatically cause the beam to turn off and subsequent reinstatement of this interlock must not automatically turn the beam on.

2.5.3 Last person out button

There must be a 'last person out button' that is interlocked to ensure that the equipment cannot be put into the loaded state unless the button has been pressed.
The button must be located within the treatment room. The activation of the button must be indicated by an audible signal.

2.5.4 Rooms within treatment rooms

Any door (such as a door to a walk-in cupboard) opening on to the treatment room other than the main access door must be lockable from the outside. The door must not be able to be deadlocked.

2.5.5 Emergency switch

Emergency-off switches, which terminate an exposure, must be provided within the treatment room. These switches must be conspicuous, clearly labelled and readily accessible to personnel within the treatment room.

2.5.6 Materials within the treatment room

Low and medium atomic number materials susceptible to photon activation, such as aluminium and copper, should not be used for construction or decoration in areas of the room exposed to the primary beam.

2.5.7 Patient monitoring

The operator of the linear accelerator unit must be able to view and to communicate with the patient at all times during the therapy procedure.

3. Vehicles

- Where a (mobile) radiation apparatus – x-ray is to be primarily stored in a road vehicle, then the radiation apparatus must be securely located in the vehicle to protect it from damage during transport.

- A road vehicle, in which a radiation apparatus – x-ray is to be primarily stored, and which is not a trailer, must have an alarm and an engine immobiliser.