Department of Health and Human Services
Population Health

Radiation Protection Act 2005 – Section 17

CERTIFICATE OF COMPLIANCE:

STANDARD FOR RADIATION PLACE

FOR RADIOACTIVE MATERIAL – SOURCES FOR HDR BRACHYTHERAPY

SECTION 1: REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR PLACES WHERE RADIOACTIVE MATERIALS – SOURCES FOR HDR BRACHYTHERAPY - ARE TO BE USED AND/OR STORED

SECTION 2: COMPLIANCE REQUIREMENTS: PLACE - RADIOACTIVE MATERIAL (SOURCES FOR HDR BRACHYTHERAPY)

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 RADIOACTIVE MATERIALS –SOURCES FOR HDR BRACHYTHERAPY - ARE TO BE USED AND/OR STORED.

This Standard is to be used when assessing a place where radioactive material, in the form of a source for High Dose Rate (HDR) brachytherapy, is to be used and/or stored.

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 - RADIOACTIVE MATERIAL (SOURCES FOR HDR BRACHYTHERAPY)

2.1 Protection of people when radioactive materials are used for HDR brachytherapy – dose rate requirements:

A treatment room in which radioactive materials are to be used and/or stored for HDR brachytherapy must:

- be so located and 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 and/or storage of the radioactive material in that place. (Occupancy factors (NCRP report 147[1]) may be taken into account when assessing compliance with this criterion.) This includes areas on the same floor level as the room or area or structure in which the radioactive material is stored and on levels above and below this room or area or structure, if applicable; and
- be so located and designed with sufficient shielding that the radiation levels at any accessible area outside the room do not result in an ambient dose equivalent rate or directional dose equivalent rate, as appropriate, exceeding 2.5 microsieverts per hour; and

[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

- be so located and designed with sufficient shielding that no occupationally exposed person will receive a radiation dose in excess of the appropriate limit specified in Regulation 9, *Radiation Protection Regulations 2006*, "Dose limits for occupational exposure of persons" and such that the resultant radiation exposure rate in any area accessible to occupationally exposed people is as low as reasonably achievable;
- be so designed that the radiation levels inside the treatment room, at locations more than 50 cm from the treatment head, that may be accessed by staff do not result in an ambient dose equivalent rate or directional dose equivalent rate, as appropriate, exceeding 0.5 microsieverts per hour.

2.2 Interior room design

- A treatment room in which radioactive materials are to be used for HDR brachytherapy must comply with the design requirements for a medium level radiation laboratory in AS/NZS 2982.1:1997

2.3 Illuminated radiation warning signs for treatment rooms containing gamma-ray afterloading equipment

- The entrance to the treatment room must have a radiation warning sign, which illuminates *yellow* when the source is in transit and at the treatment position(s). This sign must contain words that indicate radiation exposure.

- Within the treatment room, radiation-warning devices must be activated when the apparatus is in the ready state and the source is in the "source out" 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. unload the source 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.

2.4 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 unload the source and subsequent reinstatement of this interlock must not automatically reload the source.

2.5 Last person out button

- There must be a 'last person out button' that is interlocked to ensure that the source cannot be loaded 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.

2.6 Rooms within treatment rooms

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

2.7 Emergency switch

- Emergency switches, which unload the source, must be provided within the treatment room. These switches must be conspicuous, clearly labeled and readily accessible to personnel within the treatment room.

2.8 Emergency equipment

- A remote handling tool and a shielded container, as described above, are within the room and are easily accessible to the operator. At least one contoured body shield capable of reducing torso doses in an emergency situation by a factor of 100 or more must be provided, for use in the room.

2.9 Dose rate monitor

- At the exterior of the door to the treatment room there is a visual indication of the source status and of the dose rate in the treatment room, provided by a monitor that is independent of the high dose rate brachytherapy unit, including its computer.

2.10 Patient monitoring

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