

**WAC 246-228-020 Equipment requirements.** (1) *Safety device.* A device which prevents the entry of any portion of an individual's body into the primary X-ray beam path, or which causes the beam to be shut off upon entry into its path, shall be provided for all open-beam configurations. A registrant or licensee may apply to the department for an exemption from the requirement of a safety device. Such application shall include:

(a) A description of the various safety devices that have been evaluated;

(b) The reason each of these devices cannot be used; and

(c) A description of the alternative methods that will be employed to minimize the possibility of an accidental exposure, including procedures to assure that operators and others in the area will be informed of the absence of safety devices.

(2) *Warning devices.* Open-beam configurations shall be provided with a readily discernible indication of:

(a) X-ray tube status (ON-OFF) located near the radiation source housing, if the primary beam is controlled in this manner and at or near the port and/or

(b) Shutter status (OPEN-CLOSED) located near each port on the radiation source housing, if the primary beam is controlled in this manner.

(c) Warning devices shall be labeled so that their purpose is easily identified and the devices shall be conspicuous at the beam port. On new equipment installed after January 1, 1976, warning devices shall have fail-safe characteristics.

(3) *Ports.* Unused ports on radiation source housings shall be secured in the closed position in a manner which will prevent casual opening. Such security requirement will be deemed met if the beam port cannot be opened without the use of tools not part of the closure for units installed after January 1, 1981.

(4) *Labeling.* All analytical X-ray equipment shall be labeled with a readily discernible sign or signs bearing the radiation symbol and the words:

(a) "CAUTION - HIGH INTENSITY X-RAY BEAM," or words having a similar intent, on the X-ray source housing; and

(b) "CAUTION RADIATION - THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED," or words having a similar intent, near any switch that energizes an X-ray tube if the radiation source is an X-ray tube; or

(c) "CAUTION - RADIOACTIVE MATERIAL," or words having a similar intent, on the source housing if the radiation source is a radionuclide.

(5) *Shutters.* On new equipment employing open-beam configurations installed after January 1, 1981, each port on the radiation source housing shall be equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port.

(6) *Warning lights.* An easily visible warning light labeled with the words "X-RAY ON," or words having a similar intent, shall be located:

(a) Near any switch that energizes an X-ray tube and near any X-ray port and shall be illuminated only when the tube is energized; or

(b) In the case of a radioactive source, near any switch that opens a housing shutter, and shall be illuminated only when the shutter is open.

(c) On equipment installed after January 1, 1981, warning lights shall have fail-safe characteristics.

(7) *Radiation source housing.* Each X-ray tube housing shall be so constructed that with all shutters closed the leakage radiation meas-

ured at a distance of 5 cm from its surface is not capable of producing a dose equivalent in excess of 2.5 mrem in one hour at any specified tube rating. If radioactive sources are used, corresponding dose limits shall not exceed 2.5 mrem per hour.

(8) *Generator cabinet.* Each X-ray generator shall be supplied with a protective cabinet which limits leakage radiation measured at a distance of 5 cm from its surface such that it is not capable of producing a dose equivalent in excess of 0.25 mrem in one hour.

[Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-228-020, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-40-030, filed 12/8/80; Order 1084, § 402-40-030, filed 1/14/76.]