

*Radiation Protection Act 2005 – Section 17*

**CERTIFICATE OF COMPLIANCE:  
STANDARD FOR RADIATION APPARATUS -  
X-RAY MOBILE SECURITY**

SECTION 1: REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR  
CLASSES OF RADIATION APPARATUS

SECTION 2: PARTS OF STANDARDS AND CODES OF PRACTICE ADOPTED BY  
THIS STANDARD

**This information can also be accessed at**  
[http://www.dhhs.tas.gov.au/peh/radiation\\_protection](http://www.dhhs.tas.gov.au/peh/radiation_protection)

## **Section 1 – REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR CLASSES OF RADIATION APPARATUS.**

### **PART – A**

**Section 2 of this Standard is to be used by an accredited person when assessing Radiation Apparatus, classified by Radiation Protection Act 2005 licences as “X-ray mobile security”, for the purpose of issuing a certificate of compliance in accordance with 17 (1) (b) of the Radiation Protection Act 2005.**

**The Radiation Apparatus must be shown to fully comply with the requirements in Section 2 of this Standard.**

**The requirements in Section 2 are taken from the following:**

<b>RHS 31</b>	National Health and Medical Research Council “Code of Practice For the Safe Use of Industrial Radiography Equipment (1989)”
<b>RAR</b>	Regulatory Authority Requirement-Department of Health and Human Services

## **PART – B**

**Section 2 of this Standard is to be used by a person or company licensed to manufacture or sell Radiation Apparatus, classified by Radiation Protection Act 2005 licences as “X-ray mobile security”, for the purpose of issuing a certificate of compliance in accordance with 17 (1) (b) of the Radiation Protection Act 2005.**

**The holder of a licence to manufacture or sell such Radiation Apparatus must be able to show that the Radiation Apparatus fully complies with the following Standards.**

**RHS 31**                      National Health and Medical Research Council “Code of Practice For the Safe Use of Industrial Radiography Equipment (1989)”

**RAR**                              Regulatory Authority Requirement-Department of Health and Human Services

## Section 2 – PARTS OF STANDARDS AND CODES OF PRACTICE ADOPTED BY THIS STANDARD

ITEM	Requirements
<b>Markings on the X-ray unit</b>	
<b>“Warning”</b>	<p>X-ray equipment must carry a warning similar to any of the statements below to indicate a radiation hazard;</p> <p><i>“Warning this X-ray equipment may be hazardous unless safe exposure factors and operating instructions are observed”</i></p> <p>“Caution x-rays produced when energised”</p> <p>“Caution equipment produces radiation”</p> <p><b>RAR</b></p>
<b>Supplier</b>	The name of the supplier and or manufacturer
<b>Type number of tube</b>	<p>The accompanying documents must identify the correct x-ray tube type for the x-ray unit.</p> <p><b>RAR</b></p>
<b>X-ray tube potential and current</b>	<p>Where the X-ray tube potential and current are fixed, their values must be indicated by permanent labelling on the x-ray unit or in accompanying documents</p> <p><b>RAR</b></p>
<b>Indication of exposure factors</b>	<p>Where X-ray equipment operates at fixed X-ray tube voltages and currents, the exposure factors must be indicated in the accompanying documents and on labels attached to the equipment.</p> <p><b>RAR</b></p>
<b>Exposure factors</b>	<p>X-ray equipment must be designed to permit the operator to preset exposure factors without the need for energizing the X-ray tube</p> <p><b>RAR</b></p>
<b>Supply indicator</b>	<p>An indicator on the control panel must be incorporated to indicate when the main switch is in the “ON” position and the control panel is energized.</p> <p><b>RAR</b></p>
<b>Beam on indicator and audible indicator</b>	<p>An indicator, clearly visible to the operator, must indicate when the X-ray tube is energised. The beam on indicator must be clearly marked.</p> <p>A signal audible to the operator, must indicate either the duration of the exposure or its termination. <b>Note, in some types of mobile security x-ray equipment the noise of the “spark gap” operating is considered by the manufacturer to be sufficient for this criteria to be met.</b></p> <p><b>RAR</b></p>

<b>Controls</b>	
<b>Key switch</b>	<p>A key switch must be fitted to the X-ray control panel to prevent unauthorized use. The key must be removable only when the switch is in the off position.</p> <p>The function of the key switch and its on and off positions must be clearly marked on the control panel.</p> <p><b>RHS 31 5.2.1.3</b></p>
<b>X-ray ON/OFF</b>	<p>X-ray on and off controls must be physically separate from the key switch.</p> <p>Their function, and the on and off positions, must be clearly marked on the control panel.</p> <p><b>RHS 31 5.2.1.4</b></p>
<b>Delayed exposure switch</b>	<p>A delayed exposure setting must provide an audible/visible indication that the x-ray unit is preparing to expose.</p> <p><b>RAR</b></p>
<b>Ready to expose</b>	<p>Visible indication must be provided indicating the x-ray unit is preparing to expose</p> <p><b>RAR</b></p>
<b>Remote control</b> <ul style="list-style-type: none"> <li>▪ “Dead-Man” operation</li> <li>▪ Continuous pressure required</li> </ul>	<p>Where the x-ray exposure is initiated by a remote control connected to the x-ray unit, the exposure must be able to be interrupted at any time (dead man operation of the switch).</p> <p>Where the x-ray exposure is initiated by a remote control connected to the x-ray unit continuous pressure on the exposure switch must be required in order for an exposure to occur.</p> <p><b>RAR</b></p>
<b>Exposure termination and “back-up” timer</b>	<p>The exposure timer must be electronic and the circuit of the apparatus must be so designed that in the event of any failure, the failure causes the timer to revert to a safe condition and does not lead to the X-ray tube becoming energized or continuing to be energized. Compliance may be demonstrated by evidence contained in accompanying documents.</p> <p>A device must be provided which must terminate the production of X-rays after a preset interval not exceeding 30 minutes.</p> <p><b>RHS 31 5.2.1.5</b></p>

<p><b>Operation of timer (pulse settings)</b></p> <p>a) time or pulse number indicated</p> <p>b) no exposure at zero setting.</p> <p>c) alter setting.</p>	<p>The timer must terminate an exposure at a preset time interval, preset number of pulses or a preset product of current and time.</p> <p>a) This must be achieved by selecting the required time or number of pulses on the device or by selecting an icon. The manufacturer/supplier must clearly document the exposure time for each icon or state an estimate of the exposure time in terms of the number of pulses. <b>Note the pulse repetition rate for “spark gap” operated equipment may vary and affect the exposure time. The manufacturer must make note of this in accompanying document.</b></p> <p>b) It must not be possible to make exposures when the exposure device is set to “0” or “off” or an equivalent position;</p> <p>c) It must be possible to alter the timer or pulse settings to a higher or lower value after the initial adjustment without initiating exposure;</p> <p><b>RAR</b></p>
<p><b>Performance</b></p>	
<p><b>Linearity of output</b></p>	<p>The coefficient of linearity of the radiation output must be less than or equal to 0.15 when measured at three different time (number of pulses) settings.</p> <p><b>RAR</b></p>
<p><b>Output (kerma) reproducibility</b></p>	<p>The variation in radiation output must not exceed more than 15% from the mean of eight exposures taken within 10 minutes.</p>
<p><b>Accuracy of X-ray tube voltage.</b></p>	<p>The delivered X-ray tube voltage (kV peak) average should be within +/-5 kV or +/- 5%, whichever is the greater, of the nominal or indicated value.</p> <p><b>Note</b> this is not a mandatory compliance requirement but may be measured to indicate long term performance of the x-ray unit. The following points need to be taken into account when specifying the criteria for kV accuracy for pulsed equipment.</p> <ul style="list-style-type: none"> <li>• <i>The output voltage for pulsed equipment can vary depending on the spark gap firing voltage.</i></li> <li>• <i>The output voltage also depends on the impedance of the x-ray tube.</i></li> </ul> <p><b>RAR</b></p>
<p><b>Primary limitation of the X-ray beam</b></p>	<p>Each X-ray tube must be mounted in a protective housing or other protective shielding.</p> <p>The X-ray window of such housing must have an aperture of such dimension that it will not allow passage of a useful beam larger than the maximum specified.</p> <p><b>RAR</b></p>
<p><b>Radiation leakage of X-ray tube assemblies.</b></p>	<p>Leakage radiation from the x-ray unit (with the primary beam appropriately attenuated so as to not contribute to the measurement) must not exceed 30 uSv/h at 1 m from any point on the x-ray unit’s surface. X-ray duty cycle may be taken into account when calculating the leakage rate.</p> <p><b>RAR</b></p>