Radiography Equipment: Visual Inspection

Purpose

Objective: 1.2 Locate basic components of X-ray generating equipment.
Become familiar with the radiographic equipment located within the lab, and ensure safe operation of the x-ray units.

Instructions

Complete as much of the visual checklist as possible (some sections will require an exposure prior to completion). **Remember verbal permission with direct supervision from an *instructor* is required **BEFORE** any exposure. **

Annual Verification Checklist for Medical Imaging Equipment

This report is for: Acceptance _____ Compliance _____

Department: _____
Room: _____
Generator Model: _____
Manufacturer: _____
Country: _____
Serial #: _____
Equipment Type: _____

Tube Information

Description: _____
Serial #: _____
Model: _____
Date Manufactured: _____
Country Manufactured: _____
Focal Spot: Large: _____mm Small: _____mm
Inherent Filtration: _____mm Al

General Information and Facility Requirements

Yes	No	N/A	
☐	☐	☐	1. There is a certificate for the room.
☐	☐	☐	2. If (1) is "yes", the certificate must be posted in or close to the room. Location:_____

☐	☐	☐	3. Radiation shielding is adequate and meets regulatory standards.
☐	☐	☐	4. X-ray warning signs are posted on all entrance doors to the room.
☐	☐	☐	5. Protective apparel is available to patients and individuals in the radiation area
☐	☐	☐	6. A QA program exists for the department.
☐	☐	☐	7. A quality maintenance program exists for the department

General Requirements

I. Labelling

Generator

Yes	No	N/A	
☐	☐	☐	a) Name of the Manufacturer
☐	☐	☐	b) Model Designation
☐	☐	☐	c) Serial Number
☐	☐	☐	d) Date of Manufacture
☐	☐	☐	e) Country of Manufacture

X-ray Tube

Yes	No	N/A	
☐	☐	☐	a) Name of the Manufacturer
☐	☐	☐	b) Model Designation
☐	☐	☐	c) Serial Number
☐	☐	☐	d) Date of Manufacture
☐	☐	☐	e) Country of Manufacture
☐	☐	☐	f) Minimum permanent inherent filtration
☐	☐	☐	g) Are the anode and cathode clearly marked?

II. Warning Signs

Yes	No	N/A	
☐	☐	☐	The x-ray control panel must have a permanent, visible and legible sign warning that hazardous x-rays are emitted, and unauthorized use is prohibited.

III. Markings

Yes	No	N/A	
☐	☐	☐	All controls, meters, lights and other indicators related to the equipment operation must be clearly labelled or marked as to their function.

IV. Mechanical Stability

Yes	No	N/A	
☐	☐	☐	1. The x-ray tube must be securely fixed and correctly aligned within the tube housing.
☐	☐	☐	2. The x-ray assembly and support must maintain their required positions without excessive drift or vibration during operation.

V. Indicators and Indicator Lights

Yes	No	N/A	
			1. There must be distinctive and separate indicators on the control panel that indicate:
☐	☐	☐	a) when the control panel is energized and the tube is ready to produce x-rays
☐	☐	☐	b) when x-rays are being produced.
☐	☐	☐	c) if AEC is provided when that mode of operation is selected
☐	☐	☐	d) if AEC mode is not selected, or does not exist, the selected loading factors must be indicated to the operator before an irradiation
☐	☐	☐	e) if equipment is battery operated, whether enough charge is present for proper operation of the equipment.
			2. If more than one x-ray tube is controlled by one control panel:
☐	☐	☐	a) a visual indicator on or near each tube housing to show that the x-ray tube is connected and ready to be energized
☐	☐	☐	b) a visual indicator on the control panel to indicate which of the x-ray tubes is connected and ready to be energized
☐	☐	☐	3. An audible signal to indicate the termination of an exposure.

VI. Indication of Loading Factors

Yes	No	N/A	
☐	☐	☐	1. X-ray equipment having adjustable loading factors must have meters or other indicators that enable determination of the tube voltage, current and time, or combinations of these.
☐	☐	☐	2. The loading factors must be displayed before, during and after the exposure.

VII. Irradiation Control

Yes	No	N/A	
☐	☐	☐	There must be an irradiation switch, controlling timer or another mechanism to initiate and terminate x-ray production.

VIII. Irradiation and Emergency Switches

Yes	No	N/A	
☐	☐	☐	1. When the equipment is equipped with an exposure switch, it must require continuous pressure by the operator to emit x-rays.
☐	☐	☐	2. In the case of a foot switch, it must prevent the emission of any unintended x-rays when it is overturned.
☐	☐	☐	3. In the case of mobile equipment, it must allow the operator to stand at least 3m away from the x-ray source when the x-ray tube is energized.
☐	☐	☐	4. If the equipment moves around the patient by remote control, there must be an emergency stop switch that immediately terminates both equipment movement and exposure.

IX. Controlling Timer

Yes	No	N/A	
			When the equipment has a controlling timer, it must be constructed so that:
☐	☐	☐	a) it can automatically terminate an exposure on completion of a preset irradiation time, or a preset current time product value, or on completion of a preset number of x-ray pulses.
☐	☐	☐	b) it permits the operator to terminate the exposure at any time
☐	☐	☐	c) it automatically resets itself to its original setting or to zero on termination of an irradiation.
☐	☐	☐	d) when it is at zero, in the off position, or at an unmarked setting, irradiation cannot occur.

X. Focal Spot Marking

Yes	No	N/A	
☐	☐	☐	The location of the focal spot must be clearly and accurately marked on the x-ray tube housing.

Testing Frequency

This is performed annually or in conjunction with tube and generator testing. A less extensive inspection should be done by the technologist daily or when required by the department protocol.