

RPR 30A. ANALYTICAL X-RAY MACHINE SAFETY INSPECTION

Responsible user: _____ Group #: _____ Task #: _____

Location (Bldg. & Room): _____ Phone: _____

| Type and use | Manufacturer | Model | Serial No. |
|--|----------------------------------|------------|---------------|
| <input type="checkbox"/> Open beam | Control unit: _____ | _____ | _____ |
| <input type="checkbox"/> Fully enclosed [CX] | X-ray tube(s): _____ | _____ | _____ |
| <input type="checkbox"/> Diffraction enclosed [XD] | Number of ports available: _____ | _____ | In use: _____ |
| <input type="checkbox"/> Fluorescence [XF] | Target material: _____ | kVp: _____ | mA: _____ |

Accessory equipment (powder cameras, goniometers, etc.): _____

Installation date: _____ Inspection date: _____

FACILITY REQUIREMENTS

- | | |
|---|------------|
| "CAUTION - X-RAY EQUIPMENT" (or equivalent) sign at entrance? | Yes No |
| "NOTICE TO WORKERS" (DRC-04) posted conspicuously? | Yes No |
| Was the last radiation survey performed no more than 12 months ago? | Yes No N/A |
| Since the last radiation survey, have any of the following conditions occurred? | |
| Removal or disassembly of any component that normally stops the primary beam? | Yes No |
| Exposure of more than 1,000 mrem per quarter to any finger dosimeter? | Yes No |

EQUIPMENT REQUIREMENTS

Safety Devices

- | | |
|---|------------|
| Required on open beam units - is there a device that prevents any portion of the body from entering the primary beam, or a device that terminates the beam if obstructed? | Yes No N/A |
| IF "NO", has exemption been filed? | Yes No N/A |

Signs and Labels

- For Open Beam Machines:
- | | |
|---|--------|
| Is "Caution: X-rays Produced When Energized" label affixed or inscribed on cabinet? | Yes No |
| Is "Caution: Do not Insert Any Part of the Body When System is Energized-X-ray Hazard" label permanently affixed or inscribed at each port? | Yes No |
- For Closed Beam Machines:
- | | |
|---|--------|
| Is a readily discernable sign bearing a radiation symbol and the words "CAUTION: HIGH INTENSITY X-RAY BEAM" present? | Yes No |
| Is a readily discernable sign bearing a radiation symbol and the words "CAUTION - RADIATION. THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED" present? | Yes No |

Warning Lights or Devices - All Units

- | | |
|---|------------|
| Is "X-RAY ON" light - near any switch that energizes and near any x-ray port? | Yes No |
| If radioactive source - near any switch that opens a housing or shutter? | Yes No N/A |
| Is light fail safe? (required on equipment installed after November 1983) | Yes No N/A |

Additional Warning Devices Required for Open beam Units

- | | |
|--|------------|
| Is X-RAY TUBE STATUS, "ON/OFF" - located near the radiation source housing, and at or near the port, if the primary beam is controlled in this manner? | Yes No N/A |
| Is Shutter Status "OPEN/CLOSED" - located near each port on the radiation source housing, if the primary beam is controlled in this manner? | Yes No N/A |
| Are warning devices fail safe? (required on equipment installed after November 1983) | Yes No N/A |

EQUIPMENT REQUIREMENTS (Continued)

Ports and Shutters

Are unused ports on radiation source housing secured in the "closed" position in a manner that will prevent casual opening, i.e. without the use of tools? **Yes No N/A**

On equipment installed after November 1983, open beam units shall have ports equipped with a shutter that cannot be opened unless an experimental device has been connected. Does such a device exist? **Yes No N/A**

OPERATING REQUIREMENTS

Are written operating procedures available to all users of x-ray equipment? **Yes No**

Are the Radiation Safety Policy Manual and current RPR's available? **Yes No**

Has written approval been granted by the Radiation Safety Committee or the RSO for operation of the unit in a manner other than specified in the written procedure or for bypassing safety devices? **Yes No**

PERSONNEL REQUIREMENTS

Have all persons operating x-ray equipment received instruction and demonstrated adequate knowledge of:

- radiation hazards associated with use of equipment; **Yes No**
- significance of radiation warning and safety devices; **Yes No**
- operating procedures; **Yes No**
- symptoms of acute localized exposure; and **Yes No**
- procedure for reporting actual or suspected exposure? **Yes No**

Personnel Monitoring

Have personal monitoring devices (ring badges) been issued? **Yes No**

If "Yes", are they used in compliance with University requirements? **Yes No N/A**

RADIATION SURVEY DATA

Radiation survey meter(s) available at facility:

Make/Model: _____ Ser. No.: _____ Calibration Date: _____
Make/Model: _____ Ser. No.: _____ Calibration Date: _____

Radiation survey meter(s) used for this survey, if different:

Make/Model: _____ Ser. No.: _____ Calibration Date: _____
Make/Model: _____ Ser. No.: _____ Calibration Date: _____

Survey results:

With machine operating at usual kVp and mA:

Maximum exposure rate within 5 cm from tube housing: _____ mR/hr
Is the dose rate less than 2.5 mrem/hr? **Yes No**

Maximum exposure rate within 5 cm from protective cabinet: _____ mR/hr
Is the dose rate less than 0.25 mrem/hr? **Yes No**

Maximum exposure rate at operator's position: _____ mR/hr

Surveyed By: _____

**Upon completion, send this inspection report to:
Radiological Health Department, 322 RAB (Campus Address)**