

Radiological Health Program Guidelines

Registration Requirements

- Facilities which possess a radiation producing device must maintain and post a current Registration Certificate with this agency prior to using their x-ray equipment. (§ 5.3 & 13.2.a.2)
- The registrant shall notify this agency in writing of any changes which renders the information on file no longer accurate within 10 days to maintain a current registration. (5.9 & 7.3.a.12.A)
- A list of all radiation producing devices which include model and serial numbers of tube or control components, equipment maintenance records, equipment modifications and calibrations must be maintained and available for review. (§ 7.3.a.12.C)
- X-ray equipment user's manuals should be available for reference along with tube rating charts & cooling curve charts (§ 7.3.a.12)
- Correspondence concerning the Radiological Health Program Registration and inspections shall be maintained. (§ 7.3.a.12.D)
- A "Notice To Employees" shall be posted by each registrant. (§ 13.2.c.)

Radiation Protection Program

- Facilities with radiation producing devices subject to registration shall have a written Radiation Protection Program that is specific to their facility and sufficient to be in compliance with the Radiological Health Rule, Title 64, Code of State Rules Series 23. (§ 6.4.a)
- The Radiation Protection Program procedures and engineering controls used shall be based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as reasonable achievable (ALARA). (§ 6.4.b)
- The Radiation Protection Program shall be reviewed annually for content and accuracy with documented signature & date by the assigned person responsible for radiation protection. (§ 6.4.c)

- The Radiation Protection Program shall include adequate instructions on safe operating procedures for use of the x-ray equipment with training and competency documented for all x-ray operators. (§ 7.3.a.2)
- Individuals shall not be exposed to the useful beam except for healing arts purposes and unless such exposure has been authorized by a licensed practitioner of the healing arts. This specifically prohibits deliberate exposure for training, demonstration, or other non-healing arts purposes. (§ 7.3.a.7)
- X-ray Utilization Log: X-ray procedures shall be documented maintaining a record of the patient's name, the type of examination and the dates the examination was performed. (§ 7.3.a.13).
- Human Holder Log: When the patient or film must be provided with human auxiliary support, the name of the human holder shall be documented. (§ 7.3.a.13).
- The Radiation Protection Program shall include written patient radiation protection policies and procedures are available for primary and scatter radiation which must include gonadal shielding of $> 1/2$ millimeter lead equivalent material of all human patients who have not passed the reproductive age during all radiographic procedures that does not interfere with the diagnostic procedure. The fastest combination of film and screen, with the minimum exposure is required to the patient is used that is consistent with the diagnostic objective of the examination. (§ 7.3.a.6 & § 7.3.a.9.A)
- The Radiation Protection Program shall include written radiation safety policies which shall indicate the requirements for selecting a human holder as well as patient holding techniques and personal radiation protection safety techniques (§ 7.3.a.4)
- "Human Holders" provides auxiliary support to a patient or film, and are to be used only when mechanical holding devices can not be used. Written procedures shall be available to determine the human holder selection process such that no individual is routinely used. All human holder's must be instructed in personal radiation safety and protected with a minimum of $> 1/2$ millimeter lead equivalent material for primary radiation protection ensuring that no part of the body is being struck by the primary beam. (§ 7.3.a.8)

- Only required personnel for the radiographic procedure are allowed in the room when the exposure is made. Radiation protection procedures for all required personnel in the room include > than 1/4 millimeter lead equivalent material protection for scatter radiation and > 1/2 lead equivalent material for primary radiation protection ensuring that no part of the required personnel's body is being struck by the primary beam. (§ 7.3.a.5)
- Portable radiographs should be done only when it is impractical to bring the patient to a stationary x-ray room and that all patients, staff and x-ray operators in a 9 foot radius of the tube and image receptor are being removed from the area or being protected with a lead-lined barrier or protective leaded apparel. (§ 7.3.a.9.C & § 7.3.a.5)
- The x-ray facility should have protective leaded apparel and gloves in sufficient numbers to provide to adequate protection for the patient and operator (§7.3.a.8.F)

Individual Radiation Monitoring Device

- Personnel occupational radiation exposure monitoring: Individual monitoring devices are worn at the neck or collar outside of any protective aprons to measure whole body dose equivalence. (§ 6.18)
- ALARA: All radiation exposure must be maintained "As Low As Reasonably Achievable" (ALARA). The occupational dose limits for adults are: Whole Body or Deep Dose 5000 mRem, Eye Dose 15000 mRem, Skin Dose or Shallow Dose 50000 mRem. (§ 6.5)
- The occupational dose limits for "minors" and "declared pregnant workers" are: 500 mrem. (§ 6.11 & § 6.12)
- Each "declared pregnant worker" shall be provided two (2) individual monitoring devices. One badge to be worn at the neck or collar outside of any protective aprons to measure whole body dose equivalence to the "declared pregnant worker" and an additional badge to be worn at the waist under any protective aprons to measure the dose equivalence to the embryo or fetus of the "declared pregnant worker". (§ 6.17)

Shielding Plan Drawing

- Shielding Plan drawings shall include a scale drawing of all rooms containing a stationary radiation machine indicating the use of areas adjacent to the x-ray room with an estimation of the extent of occupancy by individuals in such areas. (§ 7.4.d.2)
- Shielding Plan drawings shall include the radiation machines location and maximum rated technique factors. (§ 7.4.d.2.A.)
- Shielding Plan drawings shall include the type and thickness of materials, or lead equivalency, of each wall or protective barrier. (§ 7.4.d.2.B)

X-ray Film Processing

- All radiographs are processed with the film and chemistry manufacturer recommendations. (§ 7.3.b.2.G & § 7.3.b.1)
- Darkrooms should have a method to prevent accidental entrance such as a lock or a “Darkroom: Do Not Enter” sign. (§7.3.b.2.C.)
- A darkroom or daylight processing system should be light tight. All types of x-ray film used should be stored in light tight containers; and must not be expired. (§7.3.b)
- Darkrooms shall have proper safe lights (GBX-2) placed at least 3ft above the film handling countertop. (§7.3.b)
- The film processor manufacturer recommended developer temperature and immersion time shall be posted in the darkroom. (§7.3.b.1.B.2).
- Ensure that you have documented cassette and intensifying screen cleaning and inspection as the screen manufacturer recommends (§7.3.b.2.E).
- Ensure that you have documented processor maintenance and chemistry changes according to manufacturer recommendations (§7.3.b.2.G).

X-ray Operator's Control Panel

- Radiation machine control panels bear a warning statement: “Warning: This x-ray unit may be dangerous to patient and operator unless safe exposure factors and operating instructions are observed.” (§ 7.6.a)
- The technique factors (Kv, mA & time) to be used during an exposure shall be indicated before the exposure begins. (§ 7.6.h.)
- When two or more radiographic tubes are controlled by one exposure switch, the tube which has been selected shall be clearly indicated prior to initiation of the exposure. This indication shall be both on the x-ray control panel and at or near the tube housing assembly which has been selected. (§ 7.6.f.)
- Technique charts: must be posted at each control panel to include technique factors (Kv, mA & time) for all examinations performed with that system with a reference to anatomical size, body part thickness or age, including the patient shielding requirements. (§7.3.a.3)
- Technique charts: must also include (if applicable) the type of film/screen combination to be used, the type of grid to be used and the source to image distance to be used. (§7.3.a.3)
- The exposure switch or control location must be in a protected area. A “protected area” is either behind a 6 ½ foot high permanently fixed barrier that is at least 40 inches from scatter, leakage or primary beam radiation (Table 64-23 R) or nine feet from the tube housing assembly. (§ 7.8.b.6 & § 7.8.b.7 & § 7.9.c.5.)
- The exposure switch or x-ray control shall be permanently mounted in a protected area so that the operator is required to remain in the protected area during the entire exposure. (§ 7.8.b.6.A & § 7.9.c.5.A)
- The operator must be able to observe 1) the visible indication of radiation initiation, 2) the audible indication of radiation termination, and 3) the patient from the operators protected area. (§ 7.8.b.2 or § 7.9.c.2 & 7.8.b.5)
- Intraoral dental units installed prior to 7/1/01 shall provide means to allow the operator to be in a protected area which is at least nine feet from the tube housing assembly or behind a 6 ½ foot high permanently fixed barrier that is at least 40 inches from scatter, leakage or primary beam radiation.
- Operators of intraoral dental units are NOT required to be able to view the patient from the operators protected position. (§ 7.9.c.5 & § 7.8.b.5.)