

## 10A NCAC 15 .0607 INTRAORAL DENTAL RADIOGRAPHIC SYSTEMS

(a) In addition to the provisions of Rules .0603 and .0605 of this Section, the requirements of this Rule apply to x-ray equipment and associated facilities used for dental radiography. Criteria for extraoral dental radiographic systems are covered in Rule .0606 of this Section.

(b) X-ray systems designed for use with an intraoral image receptor shall be provided with means to limit source-skin distance to not less than:

- (1) 18 centimeters, if operated above 50 kilovolts peak; or
- (2) ten centimeters, if operated at or below 50 kilovolts peak.

(c) The size of the direct radiation beam shall be limited in accordance with the following rules:

- (1) Radiographic systems designed for use with an intraoral image receptor shall be provided with means to limit the x-ray beam such that:
  - (A) If the source-skin distance (SSD) is 18 centimeters or more, the x-ray field at the SSD shall be containable in a circle having a diameter of no more than seven centimeters; and
  - (B) If the SSD is less than 18 centimeters, the x-ray field at the SSD shall be containable in a circle having a diameter of no more than six centimeters.
- (2) Effective February 1, 1981, equipment manufactured prior to August 1974 shall be equipped with a lead line open position indicating device with at least 0.79 mm lead.

(d) The timing device shall comply with the following requirements:

- (1) Termination of the exposure after a preset interval;
- (2) Termination of exposure shall cause automatic resetting of the timer to its initial setting or to zero;
- (3) It shall not be possible to make an exposure when the timer is set to a zero or "off" position if either position is provided; and
- (4) When four timer tests are performed at identical timer settings equal to five seconds or less, the average time period (T) shall be greater than five times the difference between the maximum period (Tmax) and the minimum period (Tmin) in accordance with the formula:

$$T > 5(T_{\max} - T_{\min})$$

- (5) Effective February 1, 1983, intraoral dental radiographic systems shall be equipped with an electronic timer.
- (6) Timer accuracy
  - (A) For indicated values of 0.10 seconds and above, the measured value shall be within plus or minus 15 percent of the indicated values for equipment manufactured before August 1, 1974.
  - (B) For equipment manufactured after August 1, 1974, the deviation of measured values from indicated values shall not exceed the limits specified for that system by its manufacturer.

(e) The exposure switch shall comply with the following requirements:

- (1) A control shall be incorporated into each x-ray system such that an exposure can be terminated at any time, except for exposures of one-half second or less.
- (2) Each x-ray control shall be located in such a way as to meet the following criteria:
  - (A) For stationary x-ray systems installed after the effective date of this Rule, the exposure switch shall be permanently mounted in a protected area (e.g., corridor outside the room) so that the operator is required to remain in that protected area during the entire exposure.
  - (B) For stationary x-ray systems without a protected area and installed before the effective date of this Rule, the exposure switch shall be such that the operator shall stand at least six feet away from the tube and out of the direct beam.
  - (C) For mobile and portable x-ray systems the switch shall meet the requirements of Part (e)(2)(B) of this Rule.
- (3) For equipment manufactured after August 1, 1974, the x-ray control shall provide visual indication observable at or from the operator's protected position whenever x-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated.

(f) The exposure produced shall be reproducible to within the following criteria:

When all technique factors are held constant, the coefficient of variation shall not exceed 0.10. This shall be deemed to be met if, when four exposures at identical technique factors are made, the value of the average exposure (E) is greater than five times the difference between the maximum exposure (Emax) and the minimum exposure (Emin) in accordance with the formula:

$$E > 5(E_{\text{max}} - E_{\text{min}})$$

- (g) Patient and film holding devices shall be used when the techniques permit.
- (h) Neither the tube housing nor the position indicating device shall be hand-held during an exposure.
- (i) Dental fluoroscopy without image intensification shall not be used.
- (j) Structural shielding
  - (1) All wall, floor and ceiling areas shall have protective barriers sufficient to meet the requirements of Rules .1604 and .1611 of this Chapter.
  - (2) When intraoral x-ray systems are installed in adjacent rooms or areas, protective barriers as specified in Subparagraph (j)(1) of this Rule shall be provided between the rooms or areas.

*History Note: Authority G.S. 104E-7;  
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