1	10A NCAC 15 .0604 is proposed for readoption with substantive changes as follows:
2	
3	10A NCAC 15 .0604 GENERAL REQUIREMENTS FOR ALL DIAGNOSTIC SYSTEMS OPERATOR
4	<u>REQUIREMENTS</u>
5	(a) In addition to other requirements of this Section, all diagnostic x ray systems shall meet the following
6	requirements:
7	(1) The control panel containing the main power switch shall bear the warning statement, legible and
8	accessible to view: "WARNING: This x ray unit may be dangerous to patient and operator unles
9	safe exposure factors and operation instructions are observed."
10	(2) Equivalent wording may be used on battery powered generators; visual means shall be provided or
11	the control panel to indicate whether the battery is in a state of charge adequate for proper operation
12	(3) The leakage radiation from the diagnostic source assembly measured at a distance of one meter is
13	any direction from the source shall not exceed 100 millirem in one hour when the x ray tube i
14	operated at its leakage technique factors. Compliance shall be determined by measurement
15	averaged over an area of 100 square centimeters with no linear dimension greater than 2
16	centimeters.
17	(4) The radiation emitted by a component other than the diagnostic source assembly shall not exceed
18	two millirem in one hour at five centimeters from any accessible surface of the component when it
19	is operated in an assembled x ray system under any conditions for which it was designed
20	Compliance shall be determined by measurements averaged over an area of 100 square centimeter
21	with no linear dimension greater than 20 centimeters.
22	(5) Beam Quality
23	(A) Half Value Layer
24	(i) The half value layer (HVL) of the useful beam for a given x ray tube potential shall not be less than the
25	appropriate value shown in the following table. "Specified Dental System" is any dental x ray system designed for
26	use with intraoral image receptors and manufactured after December 1, 1980. "Other X Ray Systems" shall be al
27	other x ray systems subject to this Section.
28	
29	X Ray Tube Voltage (kilovolt peak) Minimum HVL Minimum HVL
30	(millimeters (millimeters
31	——————————————————————————————————————
32	
33	
34	Designed operating Operating Dental X ray
35	range PotentialSystems Systems
36	
37	Below 50 30 1.5 0.3

1		40	1.5	0.4	
2		49	1.5	0.5	
3					
4	50 to 70		-50-	1.5	1.2
5	-	60	1.5	1.2	
6		70	1.5	1.5	
7					
8	Above 70		71	2.1	
9		80	2.3	2.3	
10		90	2.5	2.5	
11		100	2.7	2.7	
12		110	3.0	3.0	
13		120	3.2	3.2	
14		130	3.5	3.5	
15		140	3.8	3.8	
16		150	4.1	4.1	
17					
18	If it is necessa	iry to dete	rmine su	ch half v	value layer at an x ray tube potential which is not listed in the table, linear
19	interpolation (or extrapo	lation me	ay be ma	ade. Positive means shall be provided to insure that at least the minimum
20	filtration need	ed to achi	eve the a	bove bea	am quality requirements is in the useful beam during each exposure.
21	(ii) The i	equireme	its of Sul	bpart (a)((5)(A)(i) of this Rule shall be considered to be met if it can be demonstrated
22	that the alumi	num equi v	valent of	the total	l filtration in the primary beam is not less than that shown in the following
23	table:				
24					
25	Filtration Req	uired vers	us Opera	ting Volt	tage
26					
27	-				Minimum total filtration
28	Operating Vol	tage (kVp)		(inherent plus added)
29					(millimeters aluminum
30					equivalent)
31					
32	Below 50				0.5 millimeters
33	50 70				1.5 millimeters
34	Above 70				2.5 millimeters
35					
36			(iii)	Notw:	vithstanding the requirements of Subpart (a)(5)(A)(ii) of this Rule, all
37				intrao	oral dental systems manufactured after December 1, 1980, shall have a

filtration-permanently-mounted in the useful beam. (v) For expacitor energy storage equipment, compliance shall be determined with maximum quantity of charge per exposure. (vi) The required minimum aluminum equivalent filtration shall include the filtration shall include the filtration shall include the filtration of the tube and the patient, such as a tabletop-when the tube in mounted unde tuble and inherent filtration of the tube. (B) For new x-ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector-with the filter(n), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or the which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image-receptor when the image-receptor is perpendicular to the lawis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intracrul dental systems which shall meet requirements of Rule .0607(f) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) A	1		minimum of 1.3 mm aluminum equivalent illitation permanently installed in the
filtration permanently mounted in the useful beam. (v) For capacitor energy storage equipment, compliance shall be determined with maximum quantity of charge per exposure. (vi) The required minimum eluminum equivalent filtration shall include the filtration that the patient, such as a tabletop when the tube is mounted unde table and inherent filtration of the tube. (B) For new x-ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure chall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intruoral dental systems which shall meet requirements of Rule .0607(f) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiting areas	2		useful beam.
(v) For capacitor energy storage equipment, compliance shall be determined with maximum quantity of charge per exposure. (vi) The required minimum aluminum equivalent filtration shall include the filtration that the contributed by all materials which are always present between the focal spetch that tube and the patient, such as a tabletop when the tube is mounted unde table and inherent filtration of the tube. (R) For new x-ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are centrolled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hot in the plane parallel to the image receptor when the image receptor is perpendicular to the basis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscepist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (h) Structural Shielding (l) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule 0607(f) of this Section, structural shielding shall be provided to accompliance with Rules 1604 and 1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiting area	3	(iv)	Beryllium window tubes shall have a minimum of 0.5 mm aluminum equivalent
maximum quantity of charge per exposure. (vi) The required minimum aluminum equivalent filtration shall include the filtration shall include the filtration shall include the filtration of the tube. (vi) The required minimum aluminum equivalent filtration shall include the filtration of the tube. (B) For new x-ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the systems. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hot in the plane parallel to the image-receptor when the image receptor is perpendicular to the leavies. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscepist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) or Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided:	4		filtration permanently mounted in the useful beam.
(vi) The required minimum aluminum equivalent filtration shall include the filtre contributed by all materials which are always present between the focal specified to the tube and the patient, such as a tabletop when the tube is mounted under table and inherent filtration of the tube. (B) For new x-ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (b) Where two or more radiographic tubes are controlled by one exposure switch, the tube or the which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hot in the plane parallel to the image-receptor when the image-receptor is perpendicular to the leaving. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the expebegins, except which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule -0607(j) of this Section, structural shielding shall be provided to accompliance with Rules -1604 and -1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	5	(v)	For capacitor energy storage equipment, compliance shall be determined with the
contributed by all materials which are always present between the focal spot the tube and the patient, such as a tabletop when the tube is mounted unde table and inherent filtration of the tube. (B) For new x ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or table the housing assembly supports shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the beaxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bar	6		maximum quantity of charge per exposure.
the tube and the patient, such as a tabletop when the tube is mounted unde table and inherent filtration of the tube. (B) For new x ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or taken the which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the leaxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bars.	7	(vi)	The required minimum aluminum equivalent filtration shall include the filtration
table and inherent filtration of the tube. (B) For new x ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hot in the plane parallel to the image receptor when the image receptor is perpendicular to the loxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated before the exposure controls are used, in which case the techn factors which are a prior to the exposure controls are used, in which case the techn factors which are prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	8		contributed by all materials which are always present between the focal spot of
(B) For new x ray systems installed after the effective date of these Rules and which variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the leaving. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluorescopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to an compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	9		the tube and the patient, such as a tabletop when the tube is mounted under the
variable kVp and selectable filtration for the useful beam, a device shall link the selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or the which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the leavies. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to an compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	10		table and inherent filtration of the tube.
selector with the filter(s), so that the minimum filtration is always present for the selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the leavies. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure, which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) or Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bar.	11	(B) For new	x ray systems installed after the effective date of these Rules and which have
selected. (6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or twhich have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hou in the plane parallel to the image receptor when the image receptor is perpendicular to the taxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (l) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to an compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bars.	12	variable	kVp and selectable filtration for the useful beam, a device shall link the kVp
(6) Where two or more radiographic tubes are controlled by one exposure switch, the tube or to which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image receptor when the image receptor is perpendicular to the leaxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bars.	13	selector :	with the filter(s), so that the minimum filtration is always present for the kVp
which have been selected and their location shall be clearly indicated on the master control prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hour in the plane parallel to the image receptor when the image receptor is perpendicular to the leaxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	14	selected.	
prior to initiation of the exposure. (7) The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image receptor when the image receptor is perpendicular to the leaxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure, except when automatic exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bara	15	(6) Where two or mo	ore radiographic tubes are controlled by one exposure switch, the tube or tubes
The tube housing assembly supports shall be adjusted such that the tube housing assembly remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source hour in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	16	which have been	selected and their location shall be clearly indicated on the master control panel
remain stable during an exposure unless the tube housing movement is a design function of the system. (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source house in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the expension begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bara	17	prior to initiation	of the exposure.
20 system. 21 (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. 22 axis. 23 (9) Technique Indicators 25 (A) The technique factors to be used during an exposure shall be indicated before the expect begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. 28 (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. 29 (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. 30 (b) Structural Shielding 31 (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: 31 (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bara	18	(7) The tube housing	assembly supports shall be adjusted such that the tube housing assembly will
21 (8) The location of the focal spot may be indicated on a readily visible area of the x-ray source how in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. 24 (9) Technique Indicators 25 (A) The technique factors to be used during an exposure shall be indicated before the expense begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. 28 (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. 29 (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. 30 (b) Structural Shielding 31 (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bara	19	remain stable duri	ng an exposure unless the tube housing movement is a design function of the x-ray
in the plane parallel to the image receptor when the image receptor is perpendicular to the baxis. (9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barning the compliance with Rules .1604 and .1611 of this Chapter.	20	system.	
23 axis. 24 (9) Technique Indicators 25 (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. 28 (B) Indication of technique factors shall be visible from the operator's position except in ease of spot films made by the fluoroscopist. 29 (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. 30 (b) Structural Shielding 31 (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: 31 (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barries.	21	(8) The location of th	e focal spot may be indicated on a readily visible area of the x-ray source housing
(9) Technique Indicators (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barries.	22	in the plane paral	lel to the image receptor when the image receptor is perpendicular to the beam
25 (A) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated. 28 (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. 30 (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. 31 (b) Structural Shielding 32 (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to accompliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: 33 (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barning the shall be shall have primary barning the shall have primary barning the shall be shall have primary barning the shall be shall be shall be provided:	23	axis.	
begins, except when automatic exposure controls are used, in which case the techn factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bare	24	(9) Technique Indicat	ors
factors which are set prior to the exposure shall be indicated. (B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	25	(A) The tech	nique factors to be used during an exposure shall be indicated before the exposure
(B) Indication of technique factors shall be visible from the operator's position except in case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bari	26	begins, e	except when automatic exposure controls are used, in which case the technique
case of spot films made by the fluoroscopist. (C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary bari	27	factors w	hich are set prior to the exposure shall be indicated.
(C) On equipment having fixed technique factors, the recommendation in Part (a)(9)(A) of Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	28	(B) Indicatio	n of technique factors shall be visible from the operator's position except in the
Rule may be met by permanent markings. (b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	29	case of s	oot films made by the fluoroscopist.
(b) Structural Shielding (1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	30	(C) On equip	ment having fixed technique factors, the recommendation in Part (a)(9)(A) of this
(1) For stationary diagnostic systems, except for intraoral dental systems which shall meet requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	31	Rule may	/ be met by permanent markings.
requirements of Rule .0607(j) of this Section, structural shielding shall be provided to as compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	32	(b) Structural Shielding	
compliance with Rules .1604 and .1611 of this Chapter. The following shall be provided: (A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barriage.	33	(1) For stationary di	agnostic systems, except for intraoral dental systems which shall meet the
(A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	34	requirements of l	Rule .0607(j) of this Section, structural shielding shall be provided to assure
(A) All wall, floor and ceiling areas exposed to the useful beam shall have primary barn	35	compliance with I	Rules .1604 and .1611 of this Chapter. The following shall be provided:
	36		
Triniary barriers in waits shall extend to a minimum neight of 64 menes above the no	37		barriers in walls shall extend to a minimum height of 84 inches above the floor;

1		(B) Secondary barriers in the wall, floor and ceiling areas not having a primary barrier or where
2		the primary barrier requirements are lower than the secondary barrier requirements; and
3		(C) A window of lead-equivalent glass equal to that required by the adjacent barrier or a mirror
4		system shall be provided large enough and so placed that the operator can see the patient
5		without having to leave the protected area during exposures.
6	(2)	When a mobile system is used routinely in one location, the structural shielding in that location shall
7		meet the requirements for stationary diagnostic systems in Subparagraph (b)(1) of this Rule.
8	(a) A radiation	machine shall not be permitted for human, non-human, or veterinary use except when used in
9	accordance with	the operating requirements of Rule .0605 of this Section.
10	(b) Operators sh	all be trained in the operational features and safe use of the radiation machines used.
11	(c) Individuals	who operate a radiation machine shall meet the requirements for the modality of use in Paragraphs
12	(e),f),(g),(h), (i),	or (j) of this Rule no later than 36 months after the effective date of this Rule.
13	(d) Individuals v	who operate a radiation machine for research purposes or for end-of-life imaging are exempt from the
14	requirements in	Paragraphs (e),(f),(g),(h),(i), or (j) of this Rule.
15	(e) The uses of	Cone Beam CT, Veterinary CT, CT Simulation, and CT attenuation correction shall be exempt from
16	the requirement	in Subparagraph (i) of this Rule.
17	(f) Chiropractic	
18	(1)	other than the chiropractor, individuals who operate a radiation machine for chiropractic patient care
19		shall be certified by the North Carolina State Board of Chiropractic Examiners as a Certified
20		Chiropractic Assistant – Level 2 in accordance with G.S. 90-143.2 and 21 NCAC 10 .0213;
21	(2)	be a Registered Technologist (RT) by the American Registry of Radiologic Technologists (ARRT)
22		with an active registration in Radiography (R); or
23	(3)	be enrolled in a training program for radiography, and under the personal supervision of an
24		individual who meets the requirements of Subparagraphs (1) or (2) of this Paragraph.
25	(g) Dentistry	
26	(1)	other than the dentist, individuals who operate dental radiation machines shall be a licensed dental
27		hygienist;
28	(2)	shall meet radiography requirements for dental assistants as defined by the NC Board of Dental
29		Examiners; or
30	<u>(3)</u>	shall be enrolled in a training program for radiography, and under the personal supervision of an
31		individual who meets the requirements of Subparagraphs (1) or (2) of this Paragraph.
32	(h) Podiatry	
33	(1)	other than the podiatrist, all podiatric radiation machine operators shall complete radiography
34		training and pass an examination provided by the NC Foot and Ankle Society;
35	(2)	shall hold an active registration in Radiography (R) with the American Registry of Radiologic
36		Technologists (ARRT); or

1	<u>(3)</u>	shall be enrolled in a training program for radiography, and under the personal	supervision of an		
2		individual who meets the requirements of Subparagraphs (1) or (2) of this Paragraph.			
3	(i) Radiography and Fluoroscopy				
4	<u>(1)</u>	(1) Radiography			
5		(A) individuals who operate a radiation machine for plain radiography shal	l be a Registered		
6		Technologist (RT) by the American Registry of Radiologic Technologists	(ARRT) with an		
7		active registration in Radiography (R); or			
8		(B) shall be enrolled in an accredited radiography educational program and u	nder the personal		
9		supervision of an individual who meets the requirements of Part (A) of the	nis Paragraph.		
10	(2)	Fluoroscopy			
11		(A) individuals who operate fluoroscopy radiation machines shall be a physic	cian as defined in		
12		Rule .0103(b)(8) of this Chapter or an advanced practitioner provider (A	PP) as defined in		
13		Rule .0602(2) of this Section under the personal supervision of a ph	ysician who has		
14		completed training in accordance with Paragraph (1) of this Rule;			
15		(B) shall be an ARRT-registered RT and hold an active registration in Radio	graphy (R); or		
16		(C) shall be enrolled in an accredited educational program for radiograph	y and under the		
17		personal supervision of an individual who meets the requirements of	Part (B) of this		
18		<u>Subparagraph</u>			
19	<u>(3)</u>	Angiography			
20		(A) individuals who operate fluoroscopy radiation machines shall be a physic	cian as defined in		
21		Rule .0103(b)(8) of this Chapter;			
22		(B) shall be an ARRT-registered RT and hold an active registration in Radio	graphy (R);		
23		(C) shall be a graduate of a post-secondary educational program in intervent	ional cardiac and		
24		vascular technology and a Registered Cardiovascular Invasive Specialis	t (RCIS) by or a		
25		Registered Cardiac Electrophysiology Specialist (RCES) by Cardiovascu	lar Credentialing		
26		International (CCI); or			
27		(D) shall be enrolled in an accredited educational program and under the per-	sonal supervision		
28		of an individual who meets the requirements of Part (B) or (C) of this Su	<u>bparagraph.</u>		
29	(j) Computed T	omography (CT)			
30	(1)	individuals who operate a CT radiation machine for diagnostic imaging shall	l hold an active		
31		Computed Tomography (CT) registration with the ARRT; or			
32	(2)	shall be enrolled in an accredited educational program and under the personal s	supervision of an		
33		individual who meets the requirements of Subparagraph (1) of this Paragraph.			
34	(k) Dual Energ	X-Ray Absorptiometry (DEXA or DXA)			
35	<u>(1)</u>	Individuals who operate a DEXA of DXA radiation machine for diagnostic measurements	surement of bone		
36		density or body composition as ordered by a physician or APP shall be:			
37		(A) an ARRT-registered technologist with an active registration in Bone Den	sitometry (DB);		

1		(B) a Certified Bone Densitometry Technologist (CBDT) by the International Society for
2		Clinical Densitometry (ISCD); or
3		(C) enrolled in an accredited educational program and under the personal supervision of an
4		individual who meets the requirements of Part (A) or (B) of this Subparagraph.
5	(2)	All individuals who operate a DEXA or DXA radiation machine shall receive training specific to
6		the radiation machine used and training in basic principles of radiation protection prior to using the
7		radiation machine.
8	(1) Veterinary I	maging
9	<u>(1) oth</u>	er than the veterinarian, all veterinary radiation machine operators shall be:
10		(A) under the personal supervision of a veterinarian;
11		(B) be a veterinary technician; or
12		(C) under the personal supervision of a veterinary technician.
13	(2)	other than a veterinarian, all veterinary radiation machine operators shall be employed or engaged
14		by a veterinarian or the owner of a veterinary facility registered in accordance with Section .0200
15		of this Chapter.
16	(m) For individ	uals other than radiologists, instruction and training to operate fluoroscopic and angiographic radiation
17	machines by ph	ysicians and APPs shall include:
18	(1)	radiation quantities and units;
19	<u>(2)</u>	biological effects of ionizing radiation and recognition of symptoms of acute localized exposure;
20	<u>(3)</u>	radiation dose management and optimization of image quality; and
21	<u>(4)</u>	equipment features.
22	(n) Training re	cords for each operator of a radiation machine shall be maintained and available for agency review
23	during inspection	on.
24		
25	History Note:	Authority G.S. 104E-7;
26		Eff. February 1, 1980;
27		Amended Eff. January 1, 1994; October 1, 1980;
28		Transferred and Recodified from 15A NCAC 11 .0604 Eff. February 1, 2015 .2015;
9		Readonted Eff May 1 2026