

## **902 KAR 100:145. Cabinet systems.**

RELATES TO: KRS 211.842-211.852, 211.990(4)

STATUTORY AUTHORITY: KRS 194.050, 211.090, 211.844

NECESSITY, FUNCTION, AND CONFORMITY: The Cabinet for Human Resources is authorized by KRS 211.844 to regulate the possession or use of sources of ionizing or electronic product radiation and to regulate the handling and disposal of radioactive waste. The purpose of this administrative regulation is to provide requirements for the possession, use or operation of cabinet x-ray systems.

Section 1. Applicability. This administrative regulation shall apply to persons who possess, use or operate cabinet x-ray systems. This administrative regulation does not apply to microscopic analytical x-ray systems.

Section 2. For cabinet x-ray systems installed prior to April 10, 1975, the systems shall:

- (1) Have the radiation machine and objects exposed thereto, within a permanent enclosure, within which no person is permitted to remain during the generation of x-radiation.
- (2) Have adequate interlocks provided so that if doors or panels to the enclosure are opened, the radiation-producing machine is shut off automatically. After shutoff, it shall be possible to restore the machine to full operation only from the control panel outside the room.
- (3) If the enclosure is of a size or is so arranged that the operator cannot readily determine whether the enclosure is unoccupied, there shall be provided:
  - (a) Audible or visible warning signals within the enclosure which are required to be activated before irradiation can be started.
  - (b) Suitable means of exit, so that a person who accidentally may be shut in can leave the enclosure without delay, or effective means within the enclosure for preventing or quickly interrupting the irradiation, and which cannot be reset from outside the enclosure.
- (4) Except as provided in subsection (5) of this section, the exposure at accessible regions two (2) inches from the outside surface of the enclosure cannot exceed five-tenths (0.5) milliroentgen in one (1) hour.
- (5) If the registrant has submitted operating and safety procedures, and the cabinet has approved the procedures, which can show that an individual cannot receive a radiation dose in excess of the limits specified in these administrative regulations, the radiation levels specified in subsection (4) of this section may be exceeded. However, cabinet x-ray systems under this subsection shall not exceed the limits specified below:
  - (a) The exposure at accessible and occupied areas one (1) foot from the outside surface of the enclosure shall not exceed ten (10) milliroentgens in one (1) hour.
  - (b) The exposure at accessible and normally unoccupied areas one (1) foot from the outside surface of the enclosure shall not exceed 100 milliroentgens in one (1) hour.
- (6) Operating procedures.
  - (a) Before a new installation is placed in routine operation, a radiation protection survey shall be made. This shall also be done after changes in an existing installation which might affect its radiation safety.
  - (b) A copy of each radiation protection survey shall be signed and dated by the surveyor, and kept on file by the individual in charge of the installation.
  - (c) The installation shall be operated in conformance with recommendations of the protection survey.
  - (d) The registrant shall designate a competent employee as the radiation safety officer.

Section 3. For cabinet x-ray systems installed on or after April 10, 1975, systems shall:

- (1) Have the radiation machine and objects exposed thereto, within a permanent enclosure, within which no person is permitted to remain during the generation of x-radiation.
- (2) Be so constructed that radiation emitted from the cabinet x-ray system shall not exceed an exposure of five-tenths (0.5) milliroentgen in one (1) hour at points five (5) centimeters outside the external surface.
- (3) Have a permanent floor. Support surfaces to which a cabinet x-ray system is permanently affixed may be deemed the floor of the system.
- (4) Be so constructed that the insertion of part of the human body through ports or apertures shall not be possible.
- (5) Be so constructed that each door of a cabinet x-ray system has a minimum of two (2) safety interlocks. One (1), but not both of the required interlocks, shall be configured in a manner that door opening results in physical disconnection of the energy supply circuit to the high-voltage generator, and this disconnection shall not be dependent upon moving parts other than the door.
- (6) Be so constructed that each access panel shall have at least one (1) safety interlock.
- (7) Following interruption of x-ray generation by the functioning of a safety interlock, use of a control provided in accordance with subsection (10)(b) of this section shall be necessary for resumption of x-ray generation.
- (8) Be so constructed that failure of a single component of the cabinet x-ray system shall not cause failure of more than one (1) required safety interlock.
- (9) Be so constructed that a ground fault shall not result in the generation of x-rays.
- (10) For systems to which this section is applicable, there shall be provided:
  - (a) A key-actuated control to insure that x-ray generation is not possible with the key removed.
  - (b) A control or controls to initiate and terminate the generation of x-rays other than by functioning of a safety interlock of the main power control.
  - (c) Two (2) independent means which indicate if and only if x-rays are being generated, unless the x-ray generation period is less than one-half (1/2) second, then the indicators shall be activated for one-half (1/2) second, and which are discernible from points at which initiation of x-ray generation is possible. Failure of a single component of the cabinet x-ray system shall not cause failure of both indicators to perform their intended function. One (1), but not both, of the indicators required by this paragraph may be a milliammeter labeled to indicate x-ray tube current. Other indicators shall be legibly labeled "X-RAY ON."
  - (d) Additional means other than milliammeters which indicate if and only if x-rays are being generated, unless the x-ray generation period is less than one-half (1/2) second then the indicators shall be activated for one-half (1/2) second, to insure that at least one (1) indicator is visible from each door, access panel, and port, and is legibly labeled "X-RAY ON."
- (11) For cabinet x-ray systems designed to admit humans, there shall also be provided:
  - (a) A control within the cabinet for preventing and terminating x-ray generation, which cannot be reset, overridden or bypassed from the outside of the cabinet.
  - (b) No means by which x-ray generation can be initiated from within the cabinet.
  - (c) Audible and visible warning signals within the cabinet which are activated for at least ten (10) seconds immediately prior to the first initiation of x-ray generation after closing doors designed to admit humans. Failure of a single component of the cabinet x-ray system shall not cause failure of both the audible and visible warning signals.
  - (d) A visible warning signal within the cabinet which remains actuated if and only if x-rays are being generated, unless the x-ray period is less than one-half (1/2) second then the indicators shall be activated for one-half (1/2) second.

- (e) Signs indicating the meaning of the warning signals specified in subsection (11)(c) and (d) of this section and containing instructions for the use of the control specified in subsection (11)(a) of this section. These signs shall be legible, accessible to view, and illuminated if the main power control is in the "on" position.
  - (f) The designated operator(s) shall have a copy of the manufacturer's operating procedures and maintenance manual for the equipment being used and shall have been instructed in the proper techniques of equipment utilization.
  - (g) Tests for proper operation of interlock and door seal systems shall be conducted and recorded at intervals not to exceed one (1) month.
- (12) Have permanently affixed or inscribed on the cabinet x-ray system at the location of controls which can be used to initiate x-ray generation, a clearly legible and visible label bearing the statement: "CAUTION: X-RAYS PRODUCED WHEN ENERGIZED."
- (13) Have permanently affixed or inscribed on the cabinet x-ray system adjacent to each port a clearly legible and visible label bearing the statement: "CAUTION: DO NOT INSERT ANY PART OF THE BODY WHEN SYSTEM IS ENERGIZED - X-RAY HAZARD."
- (14) Additional requirements for x-ray baggage inspection systems. X-ray systems designed primarily for the inspection of carryon baggage at airline, railroad, and bus terminals, and at similar facilities, shall be provided with means specified in paragraphs (a) and (b) of this subsection, to insure operator presence at the control area in a position which permits surveillance of the ports and doors during generation of x-radiation.
- (a) During an exposure or preset succession of exposures of one-half (1/2) second or greater duration, the means provided shall enable the operator to terminate the exposure or preset succession of exposures at once.
  - (b) During an exposure or preset succession of exposures of less than one-half (1/2) second duration, the means provided may allow completion of the exposure in progress but shall enable the operator to prevent additional exposures.
- (1 Ky.R. 417; eff. 2-5-1975; 12 Ky.R. 1412; eff. 3-4-1986; 18 Ky.R. 1570; eff. 1-10-1992; Crt eff. 8-16-2019.)