



Ohio Administrative Code

Rule 3701:1-68-06 Non-medical cabinet systems.

Effective: June 30, 2023

In addition to the applicable rules in this chapter and Chapter 3701:1-38 of the Administrative Code, handlers of cabinet systems will comply with the following:

(A) All cabinet system will meet the following equipment standards:

(1) Radiation emitted from a cabinet system will not exceed an exposure of 4.4 microgray (0.5 milliroentgen) in one hour at any point five centimeters outside the external surface.

(2) Cabinet systems provided with at least one port will be designed such that the insertion of any part of the human body through any port into the primary beam will not be possible.

(3) Cabinet systems provided with at least one aperture will be designed such that the insertion of any part of the human body through any aperture will not be possible.

(4) Safety Interlocks:

(a) Each door will have a minimum of two safety interlocks. One, but not both of the obligated interlocks will be such that door opening results in physical disconnection of the energy supply circuit to the high-voltage generator, and such disconnection will not be dependent upon any moving part other than the door;

(b) Each access panel will have at least one safety interlock;

(c) Following interruption of x-ray generation by the functioning of any safety interlock, use of a control provided in accordance with paragraph (A)(6)(b) of this rule will be necessary for resumption of x-ray generation; and

(d) Failure of any single part of the enclosed fail-safe system will not cause failure of more than one



obligated safety interlock.

(5) A ground fault will not result in the generation of x-rays.

(6) Controls and indicators will provide:

(a) A key-actuated control to ensure 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 or the main power control;

(c) Two independent means which indicate when and only when x-rays are being generated, unless the x-ray generation period is less than one-half second, in which case the indicators will be activated for one-half second, and which are discernible from any point at which initiation of x-ray generation is possible. Failure of a single part of the cabinet system will not cause failure of both indicators to perform their intended function. One, but not both, of the indicators obligated by this paragraph may be a milliammeter labeled to indicate x-ray tube current. All other indicators will be legibly labeled "X-RAY ON";

(d) Additional means other than milliammeters which indicate when and only when x-rays are being generated, unless the x-ray generation period is less than one-half second in which case the indicators will be activated for one-half second, as needed to insure that at least one indicator is visible from each door, access panel, and port, and is legibly labeled "X-RAY ON"; and

(e) Warning labels:

(i) There will be permanently affixed or inscribed on the cabinet x-ray system at the location of any 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."

(ii) There will be 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."



(B) In addition to the obligations specified in paragraph (A) of this rule, cabinet systems that are designed to admit humans will provide:

(1) A control within the enclosure for preventing and terminating x-ray generation, which is electrically and/or mechanically separated from the interlock system and cannot be reset, overridden or bypassed from the outside of the enclosure.

(2) No means by which x-ray generation can be initiated from within the enclosure.

(3) Audible and visible warning signals within the enclosure that are actuated for at least ten seconds immediately prior to the first initiation of x-ray generation after closing any door designed to admit humans. Failure of any single part of the cabinet system will not cause failure of both the audible and visible warning signals.

(4) A visible warning signal within the enclosure which remains actuated when and only when x-rays are being generated, unless the x-ray generation period is less than one-half second in which case the indicators will be activated for one-half second.

(5) All entrances into the enclosure will be provided with a conspicuously visible warning device, which operates only when radiation is being produced.

(6) Signs indicating the meaning of the warning signals provided pursuant to paragraphs (B)(3) and (B)(4) of this rule and containing instructions for the use of the control provided pursuant to paragraph (B)(1) of this rule. These signs will be legible, accessible to view, and illuminated when the main power control is in the "on" position.

(7) A means for a person within the enclosure to be able to egress at all times.

(C) In addition to the obligations specified in paragraph (A) of this rule, non-human security screening systems and cabinet x-ray systems with accessible openings will:

(1) Have means to ensure operator presence at the control area in a position which permits



surveillance of the openings and doors during generation of x-radiation.

(2) During an exposure or preset succession of exposures of one-half second or greater duration, provide the means to enable the operator to terminate the exposure or preset succession of exposures at any time.

(3) During an exposure or preset succession of exposures of less than one-half second duration, may provide the means to allow completion of the exposure in progress but will enable the operator to prevent additional exposures.

(D) Cabinet systems will be evaluated and the results recorded every three months not to exceed fourteen weeks, by individuals qualified according to paragraph (H) of rule 3701:1-68-02 of the Administrative Code, unless the system has been locked out and tagged "DO NOT USE" and is under the administrative control of the IRRP:

(1) The evaluation will verify:

(a) Proper functioning of each interlock, control, indicator and warning signal; and

(b) Each label is legible and properly affixed in the appropriate location.

(2) If an interlock, control, indicator or warning signal fails, it will be immediately labeled as defective and repaired or replaced within seven calendar days.

(E) Radiation area surveys will be performed and the results recorded to confirm compliance with paragraph (A)(1) of this rule and paragraph (A) of rule 3701:1-38-14 of the Administrative Code in accordance with the following:

(1) Upon installation of the equipment;

(2) During the performance of maintenance, calibration and other procedures if the procedures obligate the presence of a primary beam; and



(3) Any time a visual inspection of the cabinet system reveals an abnormal condition.

(F) A physical radiation survey will be made after each radiographic exposure and before entry of personnel into a cabinet system designed to admit humans to verify that the radiation-generating equipment is not still producing radiation.

(1) Personnel devices providing an audible signal when activated by radiation will be acceptable for the survey, provided:

(a) Proper operation of the audible detection device is checked and recorded daily;

(b) The audible device is designed so as to clearly indicate entry into a 0.02 mSv (two mrem) per hour or greater radiation field; and

(c) All personnel working with the cabinet system are equipped with such a device; or

(2) Stationary area monitors providing an audible signal when activated by radiation will be acceptable for the survey, provided:

(a) Proper operation of the stationary detection device is checked and recorded daily;

(b) The stationary device is designed so as to clearly indicate entry into a 0.02 mSv (two mrem) per hour or greater radiation field; and

(c) Stationary area monitors are evaluated annually to determine that the audible signal operates at a 0.02 mSv (two mrem) per hour radiation field.

(G) The "Individual Responsible for Radiation Protection" (IRRP) will be qualified in accordance with paragraph (H) of rule 3701:1-68-02 of the Administrative Code.