



ADMINISTRATIVE RULES OF MONTANA



37.14.1006 FLUOROSCOPIC INSTALLATIONS

- (1) The equipment used in fluoroscopic installation shall be as follows:
 - (a) The tube housing shall be of a diagnostic type.
 - (b) During fluoroscopy and cinefluorography, the kV and the mA shall be continuously indicated.
 - (c) The source to skin distance shall not be less than:
 - (i) 38 centimeters on stationary fluoroscopes installed after March 28, 1980.
 - (ii) 35.5 centimeters on stationary fluoroscopes which are in operation prior to March 28, 1980;
 - (iii) 30 centimeters on all mobile fluoroscopes; and
 - (iv) 20 centimeters for image intensified fluoroscopes used for specific surgical application. The users operating manual must provide precautionary measures to be adhered to during the use of this device.
 - (d) The total filtration permanently in the useful beam shall be at least 2.5 millimeters aluminum equivalent.
 - (e) The equipment shall be so constructed that, under conditions of normal use, the entire cross section of the useful beam is attenuated by a primary protective barrier, permanently incorporated into the equipment and the exposure shall automatically terminate when the barrier is removed from the useful beam.
 - (i) The lead equivalent of the barrier of conventional fluoroscopes shall be at least 1.5 millimeters for equipment capable of operating up to 100 kVp, at least 1.8 millimeters for equipment capable of operating between 100 kVp and 125 kVp, and at least 2 millimeters for equipment capable of operating between 125 kVp and 150 kVp.
 - (ii) With the fluorescent screen 14 inches (35 cm) from the panel or table top, the exposure rate 2 inches (5 cm) beyond the viewing surface of the screen shall not exceed 30 mR/hr. for each R per minute at the table top with the screen in the useful beam without a patient and with the fluoroscope operating at its highest possible potential.
 - (iii) A collimator shall be provided to restrict the size of the useful beam to less than the area of the barrier. The x-ray tube and collimating system shall be linked with the fluorescent screen assembly so that the useful beam at the fluorescent screen is confined within the barrier irrespective of the panel-screen distance. For all new fluoroscopic units with image intensifiers sold in Montana after July 1, 1969, the useful

beam shall be centered on the input phosphor and during fluoroscopy or cine recording shall not exceed the diameter of the input phosphor.

- (iv) When the adjustable diaphragm is opened to its fullest extent, an unilluminated margin shall exist at all edges of the fluorescent screen when the screen is 14 inches (35 cm) from the panel surface or table top or at the fixed screen position in equipment such as orthodiascopes. In equipment used solely for image intensified fluoroscopy, the shutter shall restrict the useful beam within the diameter of the input phosphor.
 - (v) Collimators, adjustable diaphragms and shutters shall provide the same degree of attenuation as is required of the tube housing.
 - (f) The fluoroscopic exposure switch shall be a dead-man switch type.
 - (g) A shielding device of at least 0.25 millimeters lead equivalent for covering the Bucky slot during fluoroscopy shall be provided on all new units sold in Montana after July 1, 1969.
 - (h) A shield of at least 0.25 millimeters lead equivalent such as overlapping protective drapes or hinged or sliding panels shall be provided on all new units sold in Montana after July 1, 1969, to intercept scattered radiation which would otherwise reach the fluoroscopist and others near the machine.
 - (i) A cumulative timing device activated by the fluoroscope exposure switch shall be provided. It shall indicate the passage of a predetermined period of irradiation either by an audible signal or by temporary interruption of the irradiation when the increment of exposure time reaches a predetermined limit not exceeding 5 minutes.
 - (j) Image intensification shall always be provided on mobile fluoroscopic equipment. It shall be impossible to operate mobile fluoroscopic equipment unless the useful beam is intercepted by the image intensifier.
 - (k) Provision shall be made to intercept the scattered x-rays from the undersurface of the table top and other structures under the table. The shieldings shall provide the same degree of attenuation as is required of the tube housing, with the incident angle of the useful beam taken into consideration.
 - (l) Equipment to be operated in areas where explosive gases may be used shall have the approval of underwriters laboratory for such use.
- (2) Ordinarily, only secondary protective barriers shall be required for shielding in fluoroscopic installations except for combined fluoroscopic-radiographic installations.
- (3) The operating procedures for fluoroscopic installation areas are as follows:
- (a) The allowable limits for entrance exposure rates are as follows:
 - (i) The exposure measured at the point where the center of the useful beam enters the patient shall not exceed 10 roentgens per minute, except during recording of fluoroscopic images or when provided with optional high level control.
 - (ii) When provided with optional high level control, the equipment shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens per minute at the point where the center of the useful beam enters the patient unless the high level control is activated.

- (A) Special means of activation of high level controls shall be required. The high level control shall only be operable when continuous manual activation is provided by the operator.
 - (B) A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.
- (iii) In addition to the other requirements, equipment which does not incorporate an automatic exposure control shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens per minute at the point where the center of the beam enters the patient except during recording of fluoroscopic images or when provided with an optional high level control.
- (iv) Compliance with the requirements of (a) above shall be determined as follows:
 - (A) Movable grids and compression devices shall be removed from the useful beam during the measurement.
 - (B) If the source is below the table, exposure rate shall be measured 1 centimeter above the table top or cradle.
 - (C) If the source is above the table, the exposure rate shall be measured at 30 centimeters above the table top with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement.
 - (D) In a C-arm type of fluoroscope, the exposure rate shall be measured 30 centimeters from the input surface of the fluoroscopic imaging assembly.
- (b) The fluoroscopist's eyes shall be sufficiently dark adapted (20 minutes) for the visual task required before commencing fluoroscopy.
- (c) Extraneous light that interferes with the fluoroscopic examination shall be eliminated.
- (d) Protective aprons of at least 0.25 millimeters lead equivalent shall be worn in the fluoroscopy room by each person except the patient.
- (e) Only persons whose presence is necessary shall be in the fluoroscopy room during x-ray exposures.
- (f) Fluoroscopy shall not be used as a substitute for radiography but shall be reserved for the study of dynamics or spatial relationships or for guidance in spot-film recording of critical details.
- (g) Special precautions, consistent with clinical needs, shall be taken to minimize exposure of the gonads of potentially procreative patients and exposure of the embryo or fetus in patients known to be or suspected of being pregnant.
- (h) Notwithstanding ARM 37.14.721 , personnel monitoring is required for each individual who enters a controlled area.

Implementing statute(s): Sec. 75-3-201 and 75-3-202, MCA

History: NEW, 1980 MAR p. 1069, Eff. 3/28/80; TRANS, from DHES, 1996 MAR p. 433; TRANS, from DEQ, 2000 MAR p. 189.