4731.4470 REMOTE AFTERLOADER UNITS; FULL CALIBRATION.

Subpart 1. **Calibration required.** A licensee authorized to use a remote afterloader unit for medical use must perform full calibration measurements on each unit:

A. before the first medical use of the unit;

B. before medical use under the following conditions:

(1) following replacement of the source or following reinstallation of the unit in a new location outside the facility; and

(2) following any repair of the unit that includes removal of the source or major repair of the components associated with the source exposure assembly;

C. at intervals not exceeding one quarter for high dose-rate, medium dose-rate, and pulsed dose-rate remote afterloader units with sources whose half-life exceeds 75 days; and

D. at intervals not exceeding one year for low dose-rate remote afterloader units.

Subp. 2. **Required determinations.** To satisfy subpart 1, full calibration measurements must include, as applicable, determination of:

A. the output within plus or minus five percent;

B. source positioning accuracy to within plus or minus one millimeter;

C. source retraction with backup battery upon power failure;

D. length of the source transfer tubes;

E. timer accuracy and linearity over the typical range of use;

F. length of the applicators; and

G. function of the source transfer tubes, applicators, and transfer tube-applicator interfaces.

Subp. 3. **Required system.** A licensee must use the dosimetry system described in part 4731.4468, subpart 1, to measure the output.

Subp. 4. **Required protocols.** A licensee must make full calibration measurements required under subpart 1 according to published protocols accepted by nationally recognized bodies.

Subp. 5. **Autoradiograph required.** In addition to the requirements for full calibrations for low dose-rate remote afterloader units under subpart 2, a licensee must perform an autoradiograph of the source to verify inventory and source arrangement at intervals not exceeding one quarter.

Subp. 6. **Measurements by manufacturer.** For low dose-rate remote afterloader units, a licensee may use measurements provided by the source manufacturer that are made according to subparts 1 to 5.

Subp. 7. **Required corrections.** A licensee must mathematically correct the outputs determined in subpart 2, item A, for physical decay at intervals consistent with one percent physical decay.

Subp. 8. **Authorized medical physicist.** Full calibration measurements required under subpart 1 and physical decay corrections required under subpart 7 must be performed by the authorized medical physicist.

Subp. 9. **Record retention.** A licensee must retain a record of each calibration according to part 4731.4518.

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