4731.7100 DESIGN AND PERFORMANCE CRITERIA FOR SOURCES.

Subpart 1. **General requirements.** A licensee may only use sealed sources in well logging applications that:

A. are doubly encapsulated;

B. contain licensed material whose chemical and physical forms are as insoluble and nondispersible as practical; and

C. meet the requirements of subparts 2 to 4, as applicable.

Subp. 2. **Pre-1989 sources.** For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source for use in well logging applications if it meets the requirements of USASI N5.10-1968, "Classification of Sealed Radioactive Sources," American Institute of Chemical Engineers, or the requirements in subpart 3 or 4. The standard is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system.

Subp. 3. **Post-1989 sources; ANSI standard.** For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source for use in well logging applications if it meets the oil-well logging requirements of "Sealed Radioactive Sources-Classification" ANSI/HPS N43.6-1997, American National Standards Institute (1997). The standard is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system.

Subp. 4. **Post-1989 sources; prototype testing.** For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source for use in well logging applications if the sealed source's prototype has been tested and found to maintain its integrity after each of the following tests:

A. temperature test. The test source must be held at -40 degrees Celsius for 20 minutes, 600 degrees Celsius for one hour, and then be subject to a thermal shock test with a temperature drop from 600 degrees Celsius to 20 degrees Celsius within 15 seconds;

B. impact test. A five kilogram steel hammer, 2.5 centimeters in diameter, must be dropped from a height of one meter onto the test source;

C. vibration test. The test source must be subjected to a vibration from 25 hertz to 500 hertz at an amplitude of five times the acceleration of gravity for 30 minutes;

D. puncture test. A one gram hammer and pin, 0.3 centimeters pin diameter, must be dropped from a height of one meter onto the test source; and

E. pressure test. The test source must be subjected to an external pressure of 24,600 pounds per square inch absolute (1.695×10^7 pascals).

Subp. 5. **Exemptions.**

A. Subparts 1 to 4 do not apply to sealed sources that contain licensed material in gaseous form.

B. Subparts 1 to 4 do not apply to energy compensation sources. An energy compensation source must be registered with the NRC under Code of Federal Regulations, title 10, section 32.210, or with an agreement state.

Statutory Authority: *MS s 144.1202; 144.1203*

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