

PART XI

RADIATION SAFETY REQUIREMENTS FOR WIRELINE SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES

64E-5.1101 Prohibitions.

- (1) No licensee shall perform wireline service operations with a sealed source unless, prior to commencement of the operation, the licensee has a written agreement with the well operator, well owner, drilling contractor or land owner that:
 - (a) In the event a sealed source is lodged downhole, a reasonable effort at recovery will be made; and
 - (b) In the event a decision is made to abandon the sealed source downhole, the requirements of 64E-5.1119 shall be met.
- (2) No registrant shall permit above-ground testing of particle accelerators, designed for use in well-logging, which results in the production of radiation, except in areas or facilities controlled or shielded so that the requirements of Part III, as applicable, are met.

Specific Authority: 404.051, 404.061, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.22(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1203.

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SUBPART A EQUIPMENT CONTROL

64E-5.1102 Storage and Transportation Precautions.

- (1) Each sealed source of radioactive material shall be provided with a storage or transport container. The container shall be provided with a lock or tamper seal to prevent unauthorized removal of, or exposure to, the source of radiation.
- (2) Sealed sources of radioactive material shall be stored in a manner which will minimize danger from explosion and fire.
- (3) Transport containers shall be physically secured to the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

Specific Authority: 404.051, 404.061, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), F.S.

History: New July 17, 1985, Amended April 4, 1989, Formerly 10D-91.1204.

64E-5.1103 Radiation Survey Instruments.

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- (1) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each field station **and temporary jobsite** to make physical radiation surveys as required by this part and by Part III. Instrumentation shall be capable of measuring 0.1 milliroentgen **(0.001 mSv)** per hour through at least 50 milliroentgens **(0.5 mSv)** per hour.
 - (2) Radiation survey instruments used to establish dose rates shall be calibrated:
 - (a) At energies and geometries appropriate for use;
 - (b) At intervals not to exceed 6 months, and after each instrument servicing;
 - (c) Such that accuracy within plus or minus 20 percent can be demonstrated; and
 - (d) For linear scale instruments, at two points located approximately 1/3 and 2/3 of full-scale on each scale; for logarithmic scale instruments, at midrange of each decade, and at two points of at least one decade; and for digital instruments, at appropriate points.
 - (3) Records of survey instrument calibrations shall be maintained for 3 years after the calibration date for inspection by the department.

Specific Authority: 404.051, 404.061, 404.081, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.081(1), 404.22, F.S.

History: New July 17, 1985, Amended April 4, 1989, Formerly 10D-91.1205, **Amended October 8, 2000.**

R2

64E-5.1104 Leak Testing of Sealed Sources.

(1) Requirements. Each licensee using sealed sources containing radioactive material shall have the sources tested for leakage. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the department for 3 years after the leak test is performed or until transfer or disposal of the sealed source.

(2) Method of Testing. Tests for leakage shall be performed only by persons specifically authorized to perform such tests by the department, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state using a leak test kit or method approved by the department, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State. . The test sample shall be taken from the nearest accessible point to the sealed source where contamination might accumulate. The test sample shall be analyzed for radioactive contamination, and the analysis shall be capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample.

(3) Test frequency.

(a) Each sealed source except an energy compensation source or ECS containing radioactive material shall be tested at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that a test has been made within the 6 months before the transfer, the sealed source shall not be used until tested. If, for any reason, it is suspected that a sealed source may be leaking, it shall be removed from service immediately and tested for leakage as soon as practical.

(b) Each ECS that is not exempt from testing as specified in subsection 64E-5.1104(5), F.A.C., below, shall be tested at intervals not to exceed 3 years. In the absence of a certificate from a transferor that a test has been made within the 3 years before transfer, the ECS shall not be used until tested.

(4) Removal of Leaking or Contaminated Sources from service. . If the test specified in subsection (3), above, reveals the presence of 0.005 microcurie (185 Bq) or more of removable radioactive material, the licensee shall remove the sealed source from service immediately and shall cause it to be decontaminated, repaired, or disposed of by a person licensed by the department, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform these functions. The licensee shall check the equipment associated with the leaking source for radioactive contamination, and if contaminated, have it decontaminated or disposed of in accordance with these regulations. A report describing the equipment involved, the test results, any contamination which resulted from the leaking source, and corrective action taken shall be filed with the department within 5 days of receiving the test results.

(5) Exemptions. The following sources are exempted from the periodic leak test requirements of 64E-5.1104(1) through (4):

(a) Hydrogen 3 sources;

- (b) Sources containing radioactive material with a half-life of 30 days or less;
- (c) Sealed sources containing radioactive material in gaseous form;
- (d) Sources of beta-emitting or gamma-emitting radioactive material with an activity of 100 microcuries (3.7 MBq) or less; and
- (e) Sources of alpha-emitting radioactive material with an activity of 10 microcuries (0.370 MBq) or less.

Specific Authority: 404.022, 404.051(1)(4), 404.061, 404.081(1), F.S.

Law Implemented: 404.022, 404.051(1)(5), 404.061(2), F.S.

R6 History: New April 4, 1989, Formerly 10D-91.12051, **Amended September 28, 2006.**

64E-5.1105 Quarterly Inventory. Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation. Records of inventories shall be maintained for 2 years from the date of the inventory for inspection by the department and shall include the quantities and kinds of sources of radiation, the location where sources of radiation are assigned, the date of the inventory and the name of the individual conducting the inventory.

Specific Authority: 404.051, 404.061, 404.071, 404.081, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.071(1), 404.081(1), 404.22(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1206.

64E-5.1106 Utilization Records. Each licensee using radioactive materials shall maintain utilization records, which shall be kept available for inspection by the department for 2 years from the date of the recorded event, showing the following information for each source of radiation:

- (1) Make, model number and a serial number or a description of each source of radiation used;
- (2) The identity of the well logging supervisor or field unit to whom assigned;
- (3) Locations where used and dates of use; and
- (4) In the case of tracer materials and radioactive markers, the utilization record shall indicate the radionuclide and activity used in a particular well.

Specific Authority: 404.051, 404.061, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.081(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1207.

64E-5.1107 Design, Performance and Certification Criteria for Sealed Sources Used in Downhole Operations.

- R6 (1) **A licensee can use a sealed source in well logging applications if:**
 - R6 (a) **The sealed source** is doubly encapsulated;
 - R6 (b) **The sealed source** contains radioactive material whose chemical and physical forms are as insoluble and nondispersible as practical; and
 - R6 (c) **The sealed source meets the requirements specified in (2), (3), or (4),**
R6 **below.**

- R6 (2) A licensee can use a sealed source manufactured on or before July 14, 1989, in well logging applications if it meets the requirements of USASI N5.10 – 1968, “Classification of Sealed Radioactive Sources”, which is herein incorporated by reference and available from the Department, or the requirements specified in subsections (3) and (4), below. .
- R6 (3) A licensee can use a sealed source manufactured after July 14, 1989, in well logging applications if it meets the oil-well logging requirements specified in ANSI/HPS N43.6 – 1997, “Sealed Radioactive Sources – Classification”, which is herein incorporated by reference and available from the Department. .
- R6 (4) A licensee can use a sealed source manufactured after July 14, 1989, in well logging applications if:
- R6 (a) The sealed source’s prototype has been tested and found to maintain its integrity after each of the following tests:
- R6 1. Temperature. The test source is held at -40° C for 20 minutes, 600° C for 1 hour, and then subjected to a thermal shock test with a temperature drop from 600° C to 20° C within 15 seconds.
 - R6 2. Impact test. A 5 kg steel hammer 2.5 cm in diameter is dropped from a height of 1 m onto the test source.
 - R6 3. Vibration test. The test source is subjected to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.
 - R6 4. Puncture test. A 1 gram hammer and 0.3 cm diameter pin is dropped from a height of 1 m onto the test source.
 - R6 5. Pressure test. The test source is subjected to an external pressure of 24,600 pounds per square inch absolute (1.695 x 10⁷ pascals).
- R6 (5) The requirements of subsection (1) through (4), above, do not apply to sealed sources that contain licensed material in gaseous form.
- R6 (6) The requirements of subsections (1) through (4), above, do not apply to ECSs. ECSs shall be registered with the department as specified in subsection 64E-5.210(14), F.A.C., the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State

Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.071(1), 404.081(1), F.S.

R6 History: New July 17, 1985, Formerly 10D-91.1208m Amended September 28, 2006

R6 **64E-5.11071 Uranium sinker bars.** The licensee can use a uranium sinker bar in well logging applications only if it is legibly impressed with the words “CAUTION – RADIOACTIVE – DEPLETED URANIUM” and “NOTIFY CIVIL AUTHORITIES (OR COMPANY NAME) IF FOUND.”

R6 Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.

R6 Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.071(1), 404.081(1), F.S.

R6 History: New September 28, 2006

R6 **64E-5.11072 Energy Compensation Source.** The licensee can use an ECS that
 R6 is contained within a logging tool or other tool components only if the ECS contains 100
 R6 microcuries (3.7 MBq) or less of licensed material

R6 (1) For well logging applications with a surface casing for protecting fresh water
 R6 aquifers, use of the ECS is subject only to the requirements specified in Rules
 R8 64E-5.1104, 64E-5.1105, and 64E-5.1106, F.A.C., above.

R6 (2) For well logging applications without a surface casing for protecting fresh water
 R6 aquifers, use of the ECS is subject only to the requirements specified in Rules
 R6 64E-5.1101, 64E-1104, 64E-5.1105, 64E-5.1106, 64E-5.1119(5), and 64E-5.343
 R6 through 64E-5.349, F.A.C.

R6 Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.
 R6 Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.071(1), 404.081(1), F.S.
 R8 History: New September 28, 2006, Amended February 28, 2008.

R6 **64E-5.11073 Tritium Neutron Generator Target Source.**

R6 (1) Use of a tritium neutron generator target source containing quantities not
 R6 exceeding 30 curies (1,110 MBq) and in a well with a surface casing to protect
 R6 fresh water aquifers is not subject to the requirements specified in Rules
 R6 64E-5.1101, 64E-5.1107, 64E-5.1119(5), and 64E-5.343 through 64E-5.349,
 R6 F.A.C.

R6 (2) Use of a tritium neutron generator target source containing more than 30 curies
 R6 (1,110 MBq) or in a well without a surface casing to protect fresh water aquifers
 R6 is not subject to the requirements specified in Rule 64E-5.1107, F.A.C.

R6 Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.
 R6 Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.071(1), 404.081(1), F.S.
 R6 History: New September 28, 2006

64E-5.1108 Labeling.

(1) Each source, source holder or logging tool containing radioactive material shall
 bear a durable, legible and clearly visible marking or label, which has, as a
 minimum, the standard radiation caution symbol as described and illustrated in
 64E-5.322, without the conventional color requirement, and the following
 wording:

DANGER (OR "CAUTION")
 RADIOACTIVE

This label shall be on the smallest component transported as a separate piece of
 equipment.

(2) Each transport container shall have permanently attached to it a durable,
 legible and clearly visible label which has, as a minimum, the standard
 radiation caution symbol as described and illustrated in 64E-5.322 and the
 following wording:

DANGER (OR "CAUTION")
 RADIOACTIVE
 NOTIFY CIVIL AUTHORITIES IF FOUND

Specific Authority: 404.051, 404.061, 404.081, 404.20, F.S.
 Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.081(1), 404.20(1), F.S.
 History: New July 17, 1985, Amended January 1, 1994, Formerly 10D-91.1209.

64E-5.1109 Inspection and Maintenance.

- (1) Each licensee possessing radioactive material shall conduct, at intervals not to exceed 6 months, a program of inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers and injection tools to assure proper labeling and physical condition. Records of inspection and maintenance shall be maintained for a period of 2 years for inspection by the department.
- (2) If any inspection conducted pursuant to this section reveals damage to labeling or components critical to radiation safety, the device shall be removed from service until repairs have been made.
- (3) The repair, opening or modification of any sealed source device shall be performed only by persons specifically authorized to do so by the department, the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state.

Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.071(1), 404.081(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1210.

SUBPART B REQUIREMENTS FOR PERSONNEL SAFETY

64E-5.1110 Training Requirements.

- (1) No licensee or registrant shall permit any individual to act as a logging supervisor as defined in this part until such individual has:
 - (a) Received, in a course taught by an individual who has been licensed by the department, the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state, instruction in the subjects outlined in this part and demonstrated an understanding thereof;
 - (b) Read and received instruction in the regulations contained in this part and the applicable sections of Parts I, III and IX, or their equivalent, conditions of the appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures, and demonstrated an understanding thereof; and
 - (c) Demonstrated competence to use sources of radiation, related handling tools and radiation survey instruments which will be used on the job.
- (2) No licensee or registrant shall permit any individual to assist in the handling of sources of radiation until such individual has:
 - (a) Read or received instruction in the licensee's or registrant's operating and emergency procedures and demonstrated an understanding thereof; and

- (b) Demonstrated competence to use, under the personal supervision of the logging supervisor, the sources of radiation, related handling tools and radiation survey instruments which will be used on the job.
- (3) The licensee or registrant shall maintain employee training records for inspection by the department for 2 years following termination of employment.

Specific Authority: 404.051, 404.061, 404.071, 404.081, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.071(1), 404.081(1), 404.22(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1211.

64E-5.1111 Operating and Emergency Procedures. The licensee's or registrant's operating and emergency procedures shall include appropriate instructions in at least the following:

- (1) Handling and use of sources of radiation to be employed so that no individual is likely to be exposed to radiation doses in excess of the standards established in Part III;
- (2) Methods and occasions for conducting radiation surveys;
- (3) Methods and occasions for locking and securing sources of radiation;
- (4) Personnel monitoring and the use of personnel monitoring equipment;
- (5) As applicable, the transportation of radioactive sources to temporary job sites and field stations, including the packaging and placing of such sources in vehicles, placarding of vehicles and securing the sources during transportation;
- (6) Minimizing exposure of individuals in the event of an accident;
- (7) Procedure for notifying proper personnel in the event of an accident;
- (8) Maintenance of records;
- (9) As applicable, inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers and injection tools;
- (10) As applicable, procedures to be followed in the event a sealed source is lodged downhole; and
- (11) As applicable, procedures to be used for picking up, receiving and opening packages containing radioactive material.

Specific Authority: 404.051, 404.061, 404.081, 404.20, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.081(1), 404.20(1), 404.22, F.S.

History: New July 17, 1985, Formerly 10D-91.1212.

64E-5.1112 Personnel Monitoring. No licensee or registrant shall permit any individual to act as a logging supervisor or to assist in the use of sources of radiation unless such individual wears a film badge, optically stimulated luminescent device (OSLD), or a thermoluminescent dosimeter (TLD) that is processed and evaluated by an accredited NVLAP processor. Each film badge, OSLD or TLD shall be assigned to and worn by only one individual. Film badges shall be replaced at least monthly and OSLDs and TLDs shall be replaced at least quarterly. Each film badge, OSLD, and TLD shall be processed promptly after replacement. The licensee shall retain records of personnel dosimeters and bioassay results until the Department terminates each pertinent license or registration requiring the records.

Specific Authority: 404.051, 404.061, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.081(1)(2), F.S.

History: New July 17, 1985, Amended May 15, 1996, Formerly 10D-91.1213, Amended October 8, 2000, Amended September 28, 2006.

SUBPART C PRECAUTIONARY PROCEDURES IN LOGGING AND SUBSURFACE TRACER OPERATIONS

64E-5.1113 Security. During each logging or tracer application, the logging supervisor or other designated employee shall maintain direct surveillance of the operation to protect against unauthorized or unnecessary entry into a restricted area, as defined in 64E-5.101.

Specific Authority: 404.051, 404.061, F.S.

Law Implemented: 404.022, 404.031, 404.051(1)(4), 404.061(2), F.S.

History: New July 17, 1985, Amended August 29, 1994, Formerly 10D-91.1214.

64E-5.1114 Handling Tools. The licensee shall provide and require the use of tools that will assure remote handling of sealed sources except for low-activity calibration sources that result in a gamma exposure rate at contact of less than 100 milliroentgens (2.58×10^{-5} μC per kg) per hour.

Specific Authority: 404.051, 404.061, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), F.S.

History: New July 17, 1985, Formerly 10D-91.1215.

64E-5.1115 Subsurface Tracer Studies.

- (1) Protective gloves and other appropriate protective clothing and equipment shall be used by all personnel handling radioactive material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material.
- (2) No licensee shall intentionally inject radioactive material into any fresh water aquifers unless the Department of Health and the Department of Environmental Regulation determine that such injection will not endanger the public health, safety and welfare.
- (3) No licensee shall inject radioactive material into any well unless it can be demonstrated to the department that the procedure will not result in any liquids or gases distributed to the public exceeding the following criteria:

R12 (a) For gases, the air concentration in State of Florida Bureau of Radiation
R12 Control ALLs, DACs, and Effluent Concentrations, June 2012,
(see 64E-5.101, F.A.C.) Table II, Column 2, shall apply.

R12 (b) For liquids, the water concentration values in State of Florida Bureau of
R12 Radiation Control ALLs, DACs, and Effluent Concentrations, June 2012,
Table II, Column 2, shall apply.

Specific Authority: 404.051, 404.061, F.S.

Law Implemented: 404.022, 404.031, 404.051(1)(4), 404.061(2), F.S.

R12 History: New July 17, 1985, Amended January 1, 1994, Formerly 10D-91.1216, Amended 12-26-13.

SUBPART D RADIATION SURVEYS AND RECORDS

64E-5.1116 Radiation Surveys.

- (1) Radiation surveys and personnel exposure calculations shall be made and recorded for each area where radioactive materials are stored.
- (2) Radiation surveys and personnel exposure calculations shall be made and recorded for the radiation levels in occupied positions and on the exterior of each vehicle used to transport radioactive material. Such surveys and calculations shall include each source of radiation or combination of sources to be transported in the vehicle.
- (3) After removal of the sealed source from the logging tool and before departing the job site, a survey meter shall be used to assure that the logging tool is free of contamination.
- (4) Radiation surveys shall be made and recorded at the job site or well-head for each tracer operation, except those using tritium, carbon 14 and sulfur 35. These surveys shall include measurements of radiation levels before and after the operation. If radiation levels, post operation, exceed twice background, the area shall be decontaminated or restricted until radiation levels reach twice background.
- (5) Records required pursuant to this section shall include the dates, the identification of individuals making the survey, the identification of survey instruments used and an exact description of the location of the survey. Records of these surveys shall be maintained for inspection by the department for 2 years after completion of the survey.

Specific Authority: 404.051, 404.061, 404.071, 404.081, 404.20, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.071(1), 404.081(1), 404.20(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1217.

64E-5.1117 Documents and Records Required at Field Stations. Each licensee or registrant shall maintain, for inspection by the department, the following documents and records for the specific devices and sources used at the field station:

- (1) Appropriate license or certificate of registration;
- (2) Operating and emergency procedures;
- (3) A copy of these regulations;
- (4) Records of the latest survey instrument calibrations pursuant to 64E-5.1103 and Part III;
- (5) Records of the latest leak test results pursuant to license conditions;
- (6) Quarterly inventories required pursuant to 64E-5.1105;
- (7) Utilization records required pursuant to 64E-5.1106;
- (8) Records of inspection and maintenance required pursuant to 64E-5.1109; and
- (9) Survey records required pursuant to 64E-5.1116.

Specific Authority: 404.051, 404.061, 404.071, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4), 404.061(2), 404.071(1), 404.081(1), F.S.

History: New July 17, 1985, Formerly 10D-91.1218.

64E-5.1118 Temporary Job sites. Each licensee or registrant conducting operations at a temporary job site, which is a location to which radioactive materials have been dispatched to perform wireline service operations or subsurface tracer studies, shall have the following documents and records available at that site for inspection by the department:

- (1) Operating and emergency procedures;
- (2) Survey records required pursuant to 64E-5.1116 for the period of operation at the site;
- (3) Evidence of current calibration for the radiation survey instruments in use at the site; and
- (4) When operating in the state under reciprocity, a copy of the appropriate license, certificate of registration or equivalent documents.

Specific Authority: 404.051, 404.061, 404.081, 404.22, F.S.

Law Implemented: 404.022, 404.051(1)(4)(11), 404.061(2), 404.081(1), 404.22, F.S.

History: New July 17, 1985, Amended May 15, 1996, Formerly 10D-91.1219.

SUBPART E NOTIFICATION

64E-5.1119 Notification of Incidents, Abandonment and Lost Sources.

- (1) Notification shall be made of radiation incidents and radioactive sources lost in other than downhole logging operations in accordance with appropriate provisions of Part III.
- (2) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall:
 - (a) Monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and
 - (b) Notify the department immediately by telephone or telegraph if radioactive contamination is detected at the surface or if the source appears to be damaged.
- (3) When it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall:
 - (a) Advise the well-operator and the department of an appropriate method of abandonment, which shall include:
 1. The immobilization and sealing in place of the radioactive source with a cement plug;
 2. The setting of a whipstock or other deflection device; and
 3. The mounting of a permanent identification plaque, at the surface of the well, containing the appropriate information required by this section;
 - (b) Notify the department by telephone of the circumstances that resulted in the inability to retrieve the source and obtain the Department's approval to implement abandonment procedures or notify the Department that the licensee implemented abandonment before receiving Department approval because the licensee believed there was an immediate threat to public health and safety
 - (c) File a written report with the department within 30 days of the abandonment, setting forth the following information:
 1. Date of occurrence and a brief description of attempts to recover the source;
 2. A description of the radioactive source involved, including radionuclide, quantity and chemical and physical form;

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3. Surface location and identification of well;
 4. Results of efforts to immobilize and set the source in place;
 5. Depth of the lodged radioactive source;
 6. Depth of the top of the cement plug;
 - R6 7. Depth of the well;
 - R6 8. Information contained on the permanent identification plaque; and
 - R6 9. The immediate threat to public health and safety that justified
R6 abandonment before Department approval as specified in
R6 paragraph (3)(b), above; and
 - R6 (d) Develop and implement a means to prevent inadvertent intrusion on the
R6 source unless the source is not accessible to any subsequent drilling
R6 operations.
- (4) Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque, as described below, for posting the well or well-bore at the surface of the well unless the mounting of the plaque is not practical. The size of the plaque shall be at least 7 inches (17 cm) square and 1/8 inch (3 mm) thick. This plaque shall:
- R6 (a) Be constructed of long-lasting material, such as stainless steel, brass,
R6 bronze, or monel, and
 - R6 (b) Contain the following information engraved on its face:
 1. The word "CAUTION";
 2. The radiation symbol without the conventional color requirement;
 3. The date of abandonment;
 4. The name of the well operator or well owner;
 5. The well name and well identification numbers or other designation;
 6. The sealed sources by radionuclide and quantity of activity;
 7. The source depth and the depth to the top of the plug; and
 8. An appropriate warning, depending on the specific circumstances of each abandonment which may include:
 - a. "Do not drill below plug-back depth";
 - b. "Do not enlarge casing"; or
 - c. "Do not reenter the hole," followed by the words, "before contacting the Department of Health."

- (5) The licensee shall immediately notify the department by telephone or telegraph, and subsequently by confirming letter, if the licensee knows or has reason to believe that radioactive material has been lost in or to an underground potable water source. Such notice shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess the consequences of such loss and explain efforts planned or being taken to mitigate these consequences.

Specific Authority: 404.051, 404.061, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.081(1), F.S.

R6 History: New July 17, 1985, Formerly 10D-91.1220., **Amended September 28, 2006.**

64E-5.1120

Subjects To Be Included In Training Courses For Logging

Supervisors. The following subjects must be included in training courses for logging supervisors.

- (1) Fundamentals of radiation safety, including:
- (a) Characteristics of radiation;
 - (b) Units of radiation dose and, if appropriate, quantity of radioactivity;
 - (c) Significance of radiation dose, including:
 - 1. Radiation protection standards; and
 - 2. Biological effects of radiation dose;
 - (d) Levels of radiation from sources of radiation; and
 - (e) Methods of minimizing radiation dose, including:
 - 1. Working time;
 - 2. Working distances; and
 - 3. Shielding.
- (2) Radiation detection instrumentation to be used, including:
- (a) Use of radiation survey instruments, including operation, calibration and limitations;
 - (b) Survey techniques; and
 - (c) Use of personnel monitoring equipment;

- (3) Equipment to be used, including:
 - (a) Handling equipment, if appropriate;
 - (b) Sources of radiation;
 - (c) Storage precautions, if appropriate, and control of equipment; and
 - (d) Operation and control of equipment.
- (4) The requirements of these regulations.
- (5) The licensee's or registrant's written operating and emergency procedures.
- (6) The licensee's or registrant's record keeping procedures.

Specific Authority: 404.051, 404.061, 404.081, F.S.

Law Implemented: 404.022, 404.051(1)(4)(6), 404.061(2), 404.081(1), 404.22, F.S.

History: New July 17, 1985, Formerly 10D-91.1221.

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