January 23, 2003

Josephine M Piccone, Deputy Director **Via Email**
Office of State and Tribal Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Ms. Piccone:

Attached is a copy of the proposed revisions to the Mississippi State Department of Health*'s Regulations for Control of Radiation in Mississippi.* The proposed revisions will be made available for public comment after receiving NRC comments. We respectfully request that NRC replies by April 1, 2003. The proposed regulations are identified by line-in/line-out text and correspond to the following equivalent amendments to NRC's Part 39 regulations as listed in the RATS ID 2000-1 and 2000-2.

The only significant difference is in paragraph (a)(5)(ii) of 39.15 which states:

> "A means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations;"

Mississippi chose to remain with the existing language which states:

> "(ii) the setting of a whipstock or other deflection device,"

I believe that the current wording in the Mississippi regulations is more restrictive than the above language and would meet the "C" compatibility requirements. Exemptions to these requirements would be considered on a case by case basis. This would allow the staff to review and discuss such proposals with the licensee and other state agencies to ensure that the public and the environment are protected.

We believe that adoption of these revisions satisfies the compatibility and health and safety categories established in the Office of State and Tribal Programs (STP) Procedure SA-200.

If you have any questions, please feel free to contact me at (601)987-6893 or at rgoff@msdh.state.ms.us

Sincerely

Robert W. Goff, Director
Mississippi State Dept. of Health
Division of Radiological Health

Attachment

PART 801 **DRAFT**

SECTION W

RADIATION SAFETY REQUIREMENTS FOR WIRELINE SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES

801. W.1 Purpose. The regulations in this section establish radiation safety requirements for using sources of radiation for wireline service operations including mineral logging, radioactive markers, and subsurface tracer studies. The requirements of this section are in addition to, and not in substitution for, the requirements of Sections A, B, C, D, J, and T of these regulations.

801. W.2 Scope. The regulations in this section apply to all licensees or registrants who use sources of radiation for wireline service operations including mineral logging, radioactive markers, or subsurface tracer studies.

801. W.3 Definitions. As used in this section, the following definitions apply:

"Energy compensation source (ECS)" means a small sealed source, with an activity not exceeding 3.7 megabecquerels (100 μCi), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool's calibration when in use.

"Field station" means a facility where radioactive sources may be stored or used and from which equipment is dispatched to temporary jobsites.

"Injection tool" means a device used for controlled subsurface injection of radioactive tracer material.

"Logging assistant" means any individual who, under the personal supervision of a logging supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers or who performs surveys required by 801.W.401.

"Logging supervisor" means the individual who uses sources of radiation or provides personal supervision of the utilization of sources of radiation at a temporary jobsite and who is responsible to the licensee or the registrant for assuring compliance with the requirements of these regulations and all license and/or certificate of registration conditions.

"Logging tool" means a device used subsurface to perform well-logging.

"Mineral logging" means any logging performed for the purpose of mineral exploration other than oil or gas.

"Personal supervision" means guidance and instruction by the logging supervisor who is physically present at the jobsite ~~and watching the performance of the operation~~ in such proximity that visual contact can be maintained and immediate assistance given as required.

"Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation. This term includes radioactive collar markers and radioactive iron nails.

"Source holder" means a housing or assembly into which a radioactive source is placed for the purpose of facilitating the handling and use of the source in well-logging operations.

"Storage container" means a container designed to provide radiation safety and security when sources of radiation are being stored.

"Subsurface tracer study" means the release of a substance tagged with radioactive material for the purpose of tracing the movement or position of the tagged substance in the well-bore or adjacent formation.

"Temporary jobsite" means a location where radioactive materials are present for the purpose of performing wireline service operations or subsurface tracer studies.

"Transport container" means a container designed to provide radiation safety and security when sources of radiation are being transported.

“Tritium neutron generator target source” means a tritium source used within a neutron generator tube to produce neutrons for use in well-logging applications.

"Uranium sinker bar" means a weight containing depleted uranium used to pull a logging tool down toward the bottom of a well.

"Well-bore" means a drilled hole in which wireline service operations or subsurface tracer studies are performed.

"Well-logging" means all operations involving the lowering and raising of measuring devices or tools which may contain sources of radiation into well-bores or cavities for the purpose of obtaining information about the well or adjacent formations.

"Wireline" means a cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.

"Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

Prohibition

801.W.4 Prohibition.

(a) No licensee shall perform ~~wireline~~ well-logging service operations with a sealed source(s) 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 specifies who will be responsible for ensuring the following requirements are met:

(~~a~~1) in the event a sealed source is lost or lodged downhole, a reasonable effort at recovery will be made; ~~and~~

(2) a person may not attempt to recover a sealed source in a manner which, in the licensee's opinion, could result in its rupture;

(3) if the environment, any equipment, or personnel are contaminated with radioactive material, they must be decontaminated before release from the site or release for unrestricted use; and

(~~b~~4) in the event a decision is made to abandon the sealed source downhole, the requirements of 801.W.501(c) shall be met.

(b) The licensee shall retain a copy of the written agreement for 3 years after the completion of the well-logging operation.

Equipment Control

801.W.101 Limits on Levels of Radiation. Sources of radiation shall be used, stored, and transported in such a manner that the transportation requirements of Section T and the dose limitation requirements of Section D of these regulations are met.

801.W.102 Storage Precautions.

(a) Each source of radiation, except accelerators, shall be provided with a storage or transport container. The container shall be provided with a lock, or tamper seal for calibration sources, to prevent unauthorized removal of, or exposure to, the source of radiation.

(b) Sources of radiation shall be stored in a manner which will minimize danger from explosion or fire.

801.W.103 Transport Precautions. Transport containers shall be physically secured to the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

801.W.104 Radiation Survey Instruments.

(a) The licensee or registrant shall maintain a sufficient number of calibrated and operable radiation survey instruments at each field station and each temporary jobsite to make physical radiation surveys as required by this section and by ~~801. D.201~~ 801.D.501(a) of these regulations. Instrumentation shall be capable of measuring ~~0.1 milliroentgen~~ (~~25.8 nanocoulombs/kg~~) 0 .001 millisievert (0.1 mrem) per hour through at least ~~50 milliroentgens (12.9 microcoulombs/kg)~~ 0.5 millisievert (50 mrems) per hour. ~~Survey instruments acquired before the effective date of these regulations and capable of measuring 0.1 milliroentgen (25.8 nanocoulombs/kg) per hour through at least 20 milliroentgens (5.16 microcoulombs/kg) per hour also satisfies this requirement until July 14, 1992.~~

(b) Each radiation survey instrument shall be calibrated:

(1) at intervals not to exceed 6 months and after each instrument servicing;

(2) for linear scale instruments, at two points located approximately ⅓ and ⅔ 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; and

(3) so that accuracy within plus or minus 20 percent of the true radiation level can be demonstrated on each scale.

(c) Calibration records shall be maintained for a period of 3 years for inspection by the Agency.

801.W.105 Leak Testing of Sealed Sources.

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

~~(b) Method of Testing. Tests for leakage shall be performed only by persons specifically authorized to perform such tests by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State. The test sample shall be taken from the surface of the source, source holder, or from the surface of the device in which the source is stored or mounted and on which one might expect contamination to accumulate. The test sample shall be analyzed for radioactive con-~~

~~tamination, and the analysis shall be capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample.~~

~~(c) Interval of Testing. Each sealed source of 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 prior to the transfer, the sealed source shall not be put into use 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.~~

~~(d) Leaking or Contaminated Sources. If the test reveals the presence of 0.005 microcurie (185 Bq) or more of leakage or contamination, the licensee shall immediately withdraw the source from use and shall cause it to be decontaminated, repaired, or disposed of in accordance with these regulations. A report describing the equipment involved, the test results, and the corrective action taken shall be filed with the Agency within five days of receiving the test results.~~

(b) Method of testing. The wipe of a sealed source must be performed using a leak test kit or method approved by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State. The wipe sample must be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 185 becquerel (0.005 µCi) of radioactive material on the test sample and must be performed by a person approved by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform the analysis.

(c) Test frequency.

(1) Each sealed source (except an energy compensation source (ECS)) must be tested at intervals not to exceed 6 months. In the absence of a certificate from a transferor that a test has been made within the 6 months before the transfer, the sealed source may not be used until tested.

(2) Each ECS that is not exempt from testing in accordance with 801.W.105(e) of this section must 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 the transfer, the ECS may not be used until tested.

(d) Removal of leaking source from service.

(1) If the test conducted pursuant to 801.W.105(a) and (b) of this section reveals the presence of 185 becquerel (0.005 µCi) or more of removable radioactive material, the licensee shall remove the sealed source from service immediately and have it decontaminated, repaired, or disposed of by an Agency, an U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State licensee that is authorized 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 by an Agency, an U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State licensee that is authorized to perform these functions.

(2) The licensee shall submit a report to the Agency within 5 days of receiving the test results. The report must describe the equipment involved in the leak, the test results, any contamination which resulted from the leaking source, and the corrective actions taken up to the time the report is made.

(e) Exemptions. The following sources are exempted from the periodic leak test requirements of 801. W.105(a) through (d):

(1) hydrogen-3 (tritium) sources;

(2) sources of radioactive material with a half-life of 30 days or less;

(3) sealed sources of radioactive material in gaseous form;

(4) sources of beta- and/or gamma-emitting radioactive material with an activity of 3.7 megabecquerels (100 μCi)) or less; and

(5) sources of alpha-emitting radioactive material with an activity of 0.370 megabecquerels (10 μCi)) or less.

801.W.106 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 3 years from the date of the inventory for inspection by the Agency 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.

801.W.107 Utilization Records. Each licensee or registrant shall maintain current records, which shall be kept available for inspection by the Agency for 3 years from the date of the recorded event, showing the following information for each source of radiation:

(a) make, model number, and a serial number or a description of each source of radiation used;

(b) the identity of the well-logging supervisor or field unit to whom assigned;

(c) locations where used and dates of use; and

(d) in the case of tracer materials and radioactive markers, the utilization record shall indicate the radionuclide and activity used in a particular well and the disposition of any unused tracer materials.

801.W.108 Design and Performance ~~and Certification~~ Criteria for Sealed Sources Used in Downhole Operations.

~~(a) Each sealed source, except those containing radioactive material in gaseous form, used in downhole operations and manufactured after May 9,1986, shall be certified by the manufacturer, or other testing organization acceptable to the Agency, to meet the following minimum criteria:~~

~~(1) be of doubly encapsulated construction;~~

~~(2) contain radioactive material whose chemical and physical forms are as insoluble and nondispersible as practical; and~~

~~(3) has been individually pressure tested to at least 24,656 pounds per square inch absolute (170 MN/m^2) without failure.~~

~~(b) Sealed sources, except those containing radioactive material in gaseous form, manufactured prior to May 9, 1986, and acquired after that date, in the absence of a certificate from a transferor certifying that an individual sealed source meets the criteria of 801.W.108(a)(1) and (2) above, shall not be put into use until such determinations and testing according to 801.W.108(a)(3) have been performed.~~

~~(c) Each sealed source, except those containing radioactive material in gaseous form, used in downhole operations after May 9, 1986, shall be certified by the manufacturer, or other testing organization acceptable to the Agency, as meeting the sealed source performance requirements for oil well-logging as contained in the American National Standard N43.6, "Classification of Sealed Radioactive Sources," (formerly N542, ANSI/NBS 126).~~

~~(d) Certification documents shall be maintained for inspection by the Agency for a period of 3 years after source disposal. If the source is abandoned downhole, the certification documents shall be maintained until the Agency authorizes disposition.~~

(a) A licensee may use a sealed source for use in well- logging applications if :

(1) the sealed source is doubly encapsulated;

(2) the sealed source contains radioactive material whose chemical and physical forms are as insoluble and nondispersible as practical; and

(3) meets the requirements of 801.W.108(b), (c), or (d) of this section.

(b) 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," or the requirements in 801.W.108(c) or (d) of this section.

(c) 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 ANSI/HPS N43.6-1997, "Sealed Radioactive Sources-Classification."

(d) 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:

(1) Temperature. The test source must be held at -40º C for 20 minutes, 600º C for 1 hour, and then be subject to a thermal shock test with a temperature drop from 600º C to 20º C within 15 seconds.

(2) Impact Test. A 5 kg steel hammer, 2.5 cm in diameter, must be dropped from a height of 1 m onto the test source.

(3) Vibration test. The test source must be subject to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.

(4) Puncture test. A 1 gram hammer and pin, 0.3 cm pin diameter, must be dropped from a height of 1 m onto the test source.

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

(e) The requirements in 801.W.108(a), (b), (c), and (d) of this section do not apply to sealed sources that contain radioactive material in gaseous form.

(f) The requirements in 801.W.108(a), (b), (c), and (d) of this section do not apply to energy compensation sources (ECS). ECSs must be evaluated in accordance with 10 CFR 32.210 or equivalent Agreement State regulations.

801.W.109 Labeling.

(a) 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, without the conventional color requirement, and the following wording:

DANGER[1]
RADIOACTIVE MATERIAL

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

(b) Each storage and/or 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 in conventional colors and the following wording:

DANGER[1]
RADIOACTIVE MATERIAL
NOTIFY CIVIL AUTHORITIES (OR NAME OF COMPANY)

801.W.110 Inspection and Maintenance.

(a) Each licensee or registrant shall visually inspect the source holders, logging tools, and source handling tools, for obvious defects before each use to ensure that the equipment is in good working condition and that required labeling is present.

(b) Each licensee or registrant shall conduct, at intervals not to exceed six 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 3 years for inspection by the Agency.

(c) If any inspection conducted pursuant to 801.W.110(a) and (b) reveals damage to labeling or components critical to radiation safety, the device shall be removed from service until repairs have been made and a record must be made listing: the date of inspection, name of inspector, equipment involved, defects found, and repairs made. These records must be retained for 3 years after the defects are found for inspection by the Agency.

(d) Removal of a sealed source from a source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained, may not be performed by the licensee unless a written procedure has been approved by the Agency as part of the license application.

(e) If a sealed source is stuck in the source holder, the licensee shall not perform any operation, such as drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform this operation.

[1] or CAUTION

(f) The repair, opening, or modification of any sealed source shall be performed only by persons specifically authorized to do so by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State.

Requirements for Personnel Safety

801.W.201 Training Requirements.

(a) No licensee or registrant shall permit any individual to act as a logging supervisor as defined in this section until such individual has:

(1) received, in a course recognized by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State, instruction in the subjects outlined in Appendix A of this section and demonstrated an understanding thereof;

(2) read and received instruction in the regulations contained in this section and the applicable sections of Sections A, D, and J of these regulations or their equivalent, conditions of appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures, and demonstrated an understanding thereof;

(3) demonstrated competence to use sources of radiation, related handling tools, and radiation survey instruments which will be used on the job; and

(4) has demonstrated an understanding of the requirements in 801.W.201(a)(1) and (2) by successfully completing a written test.

(b) No licensee or registrant shall permit any individual to act as a logging assistant as defined in this section until such individual has:

(1) read and received instruction in applicable sections of Sections A, D, and J of these regulations or their equivalent;

(2) read and received instruction in the licensee's or registrant's operating and emergency procedures and demonstrated an understanding thereof;

(3) 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; and

(4) has demonstrated an understanding of the requirements in 801.W.201(b)(1) and (2) by successfully completing a written or oral test.

(c) The licensee or registrant shall provide safety reviews for logging supervisors and logging assistants at least once during each calendar year.

(d) The licensee or registrant shall maintain a record on each logging supervisor's and logging assistant's training and annual safety review. The training records must include copies of written tests and dates of oral tests given. The training records must be retained until 3 years following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for 3 years.

801.W.202 Operating and Emergency Procedures. Each licensee or registrant shall develop and follow written operating and emergency procedures which include instructions in at least the following:

(a) 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 Section D of these regulations;

(b) methods and occasions for conducting radiation surveys;

(c) methods and occasions for locking and securing sources of radiation;

(d) personnel monitoring and the use of personnel monitoring equipment;

(e) transportation to temporary jobsites and field stations, including the packaging and placing of sources of radiation in vehicles, placarding of vehicles, and physically securing sources of radiation during transportation;

(f) minimizing exposure of individuals including that from inhalation and ingestion of radioactive material, during well-logging operations and in the event of an accident;

(g) notifying proper personnel in the event of an accident;

(h) maintenance of records including records generated by logging personnel at temporary jobsites;

(i) use, inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers, and injection tools;

(j) procedure to be followed in the event a sealed source is lodged downhole;

(k) procedures to be used for picking up, receiving, and opening packages containing radioactive material;

(l) the use of tools for remote handling of sealed sources and radioactive tracer material, except low -activity calibration sources;

(m) actions to be taken if a sealed source is ruptured, including actions to prevent the spread of contamination and minimize inhalation and ingestion of radioactive material and actions to obtain suitable radiation survey instruments as required by 801.W.104; and

(n) for the use of tracers, decontamination of the environment, equipment, and personnel.

801.W.203 Personnel Monitoring.

(a) No licensee or registrant shall permit any individual to act as a logging supervisor or logging assistant unless each such individual wears, at all times during the handling of sources of radiation, ~~either a film badge or a thermoluminescent dosimeter (TLD)~~ a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. Each ~~film badge or TLD~~ personnel dosimeter shall be assigned to and worn by only one individual. Film badges must be replaced at least monthly and ~~TLDs~~ other personnel dosimeters replaced at least quarterly. After replacement, each ~~film badge or TLD~~ personnel dosimeter must be promptly processed.

(b) The licensee or registrant shall keep reports received from the ~~film badge or TLD~~ dosimetry processor and from the bioassay service laboratory for inspection until the Agency authorizes disposition.

Precautionary Procedures in Logging and Subsurface Tracer Studies

801.W.301 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 and/or unnecessary entry into a restricted area, as defined in Section A of these regulations.

801.W.302 Handling Tools. The licensee shall provide and require the use of tools that will assure remote handling of sealed sources other than low-activity calibration sources.

801.W.303 Subsurface Tracer Studies.

(a) Protective gloves and other appropriate protective clothing and equipment shall be used by all personnel handling radioactive tracer material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material and to avoid contamination of field stations and temporary jobsites.

(b) No licensee shall cause the injection of radioactive material into potable aquifers without prior written authorization from the Agency and any other appropriate state agency.

801.W.304 Particle Accelerators. No licensee or 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 so controlled or shielded that the requirements of 801.D.101 and 801.D.105 of these regulations, as applicable, are met.

801.W.305 Radioactive Markers. The licensee may use radioactive markers in wells, only if the individual markers contain quantities of radioactive material not exceeding the specified exempt quantities in Section 801.C. Appendix B . The use of radioactive markers in wells containing such exempt quantities of radioactive material is not subject to the other requirements of Section W.

801.W.306 Uranium Sinker Bars. The licensee may use a uranium sinker bar in well-logging operations ~~after May 9, 1987,~~ only if it is legibly impressed with the words "CAUTION-RADIOACTIVE-DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND."

801.W.307 Energy Compensation Source. The licensee may use an energy compensation source (ECS) which is contained within a logging tool, or other tool components, only if the ECS contains quantities of radioactive material not exceeding 3.7 megabecquerels (100 µCi)).

(a) For well-logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 801.W.4, and 801.W.105 through 801.W.107.

(b) For well-logging applications without a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 801.W.4, 801.W.105 through 801.W.107, and 801.W.501.

801.W.308 Tritium Neutron Generator Target Source.

(a) Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 gigabecquerels (30 Ci) and in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of this section except 801.W.4, 801.W.108, and 801.W.501.

(b) Use of a tritium neutron generator target source, containing quantities exceeding 1,110 gigabecquerels (30 Ci) or in a well without a surface casing to protect fresh water aquifers, is subject to the requirements of this section except 801.W.108.

Radiation Surveys and Records

801.W.401 Radiation Surveys.

(a) Radiation surveys shall be made and recorded for each area where radioactive materials are used and stored.

(b) Radiation surveys 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 shall include each source of radiation or combination of sources to be transported in the vehicle.

(c) If the sealed source assembly is removed from the logging tool before departing the temporary jobsite, the logging tool detector shall be energized, or a survey meter used, to assure that the logging tool is free of contamination.

(d) If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the operation, the licensee shall conduct a radiation survey, including a contamination survey, during and after the operation.

(e) Radiation surveys shall be made and recorded at the temporary jobsite or well-head for each subsurface tracer study. These surveys shall include measurements of radiation levels before and after each subsurface tracer study.

(f) Records required pursuant to 801.W.401(a) through (e) shall include the dates, the identification of individual(s) making the survey, the identification of survey instrument(s) used, and an exact description of the location of the survey. Records of these surveys shall be maintained for inspection by the Agency for 3 years after completion of the survey.

801.W.402 Documents and Records Required at Field Stations. Each licensee or registrant shall maintain, for inspection by the Agency, the following documents and records for the specific devices and sources used at the field station:

(a) appropriate license, certificate of registration, or equivalent document(s);

(b) operating and emergency procedures;

(c) applicable regulations;

(d) records of the latest radiation survey instrument calibrations pursuant to 801.W.104;

(e) records of the latest leak test results pursuant to 801.W.105;

(f) quarterly inventories required pursuant to 801.W.106;

(g) utilization records required pursuant to 801.W.107;

(h) records of inspection and maintenance required pursuant to 801.W.110;

(i) survey records required pursuant to 801.W.401;

(j) training records required pursuant to 801.W.201; and

(k) records of personnel monitoring required pursuant to 801.W.203.

801. W.403 Documents and Records Required at Temporary Jobsites. Each licensee or registrant conducting operations at a temporary jobsite shall have the following documents and records available at that site for inspection by the Agency:

(a) operating and emergency procedures;

(b) survey records required pursuant to 801.W.401 for the period of operation at the site;

(c) evidence of current calibration for the radiation survey instruments in use at the site;

(d) when operating in the State under reciprocity, a copy of the appropriate license, certificate of registration, or equivalent document(s); and

(e) shipping papers for the transportation of radioactive material.

Notification

801. W.501 Notification of Incidents, Abandonment, and Lost Sources.

(a) Notification of incidents and sources lost in other than downhole logging operations shall be made in accordance with appropriate provisions of Section D of these regulations.

(b) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall:

(1) continuously monitor at the surface for the presence of radioactive contamination with an appropriate radiation survey instrument or logging tool with a radiation detector, the circulating fluids from the well, if any, during logging tool recovery operations;

(2) notify the Agency immediately by telephone and subsequently, within 30 days, by confirmatory letter if the licensee knows or has reason to believe that a sealed source has been ruptured. This letter shall identify the well or other location, describe the magnitude and extent of the escape of radioactive material, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences; and

(3) initiate the emergency procedures required by 801.W.202.

(c) When it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall:

(1) notify the Agency by telephone, of the circumstances ~~of the loss, and request approval of the proposed abandonment procedures;~~ that resulted in the inability to retrieve the source and

(i) obtain Agency approval to implement abandonment procedures; or

(ii) that the licensee implemented abandonment before receiving Agency approval because the licensee believed there was an immediate threat to public health and safety; and

(2) advise the well-operator and the Mississippi Oil and Gas Board regarding abandonment and an appropriate method of abandonment, which shall include:

(i) the immobilization and sealing in place of the radioactive source with a cement plug,

(ii) the setting of a whipstock or other deflection device, and

(iii) the mounting of a permanent identification plaque at the surface of the well, containing the appropriate information required by 801.W.501(d); and

(3) file a written report with the Agency within 30 days of the abandonment. The licensee shall send a copy of the report to the Mississippi Oil and Gas Board that issued permits or otherwise approved the drilling operation. The report shall contain the following information:

(i) date of occurrence;

(ii) a description of the well- logging source involved, including the radionuclide and its quantity, chemical, and physical form;

(iii) surface location and identification of the well;

(iv) results of efforts to immobilize and seal the source in place;

(v) a brief description of the attempted recovery effort;

(vi) depth of the source;

(vii) depth of the top of the cement plug;

(viii) depth of the well;

(ix) the immediate threat to public health and safety justification for implementing abandonment if prior Agency approval was not obtained in accordance with 801.W.501(c)(1)(ii);

(~~ix~~x) any other information, such as a warning statement, contained on the permanent identification plaque; and

(xi) the names of state agencies receiving a copy of this report.

(d) Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque[2], ~~for posting the well or well-bore. This plaque shall:~~ constructed of long lasting material such as stainless steel, brass, bronze, or monel, must be mounted at the surface of the well, unless the mounting of the plaque is not practical. The size of the plaque must be at least 17 cm (7 inches) square and 3 mm (1/8-inch) thick. The plaque must contain the following information:

~~(1) be constructed of long-lasting material, such as stainless steel or monel; and~~

~~(2) contain the following information engraved on its face:~~

(~~i~~1) the word "CAUTION";

(~~ii~~2) the radiation symbol without the conventional color requirement;

(~~iii~~3) the date the source was ~~of abandonment~~ abandoned;

(~~iv~~4) the name of the well operator or well owner;

(~~v~~5) the well name and well identification number(s) or other designation;

(~~vi~~6) the sealed source(s) by radionuclide and activity;

(~~vii~~7) the source depth and the depth to the top of the plug; and

[2] An example of a suggested plaque is shown in Appendix B of this section.

(~~viii~~8) an appropriate warning, depending on the specific circumstances of each abandonment. [3]

(e) The licensee shall immediately notify the Agency by telephone 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 aquifer. 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.

[3] Appropriate warnings may include: (a) "Do not drill below plug-back depth"; (b) "Do not enlarge casing"; or (c) "Do not re-enter the hole", followed by the words, "before contacting the Division of Radiological Health, Mississippi State Department of Health."

PART 801

Section W

APPENDIX A

SUBJECTS TO BE INCLUDED IN TRAINING COURSES FOR LOGGING SUPERVISORS

I. Fundamentals of Radiation Safety

A. Characteristics of radiation
B. Units of radiation dose and quantity of radioactivity
C. Significance of radiation dose
    1. Radiation protection standards
    2. Biological effects of radiation dose
D. Levels of radiation from sources of radiation
E. Methods of minimizing radiation dose
    1. Working time
    2. Working distances
    3. Shielding
F. Radiation safety practices, including prevention of contamination, and methods of decontamination

II. Radiation Detection Instrumentation to be Used

A. Use of radiation survey instruments
    1. Operation
    2. Calibration
    3. Limitations
B. Survey techniques
C. Use of personnel monitoring equipment

III. Equipment to be Used

A. Handling equipment
B. Sources of radiation
C. Storage, control, and disposal of radioactive material
D. Operation and maintenance of equipment

IV. The Requirements of Pertinent Federal and State Regulations

V. The Licensee's or Registrant's Written Operating and Emergency Procedures

VI. The Licensee's or Registrant's Record Keeping Procedures

VII. Case histories and potential consequences of accidents in well-logging operations.

PART 801

SECTION W

APPENDIX B

Example of Plaque for Identifying Wells Containing Sealed Sources of Radioactive Material Abandoned Downhole

[COMPANY NAME]
[WELL IDENTIFICATION]

CAUTION

ONE 2 CURIE CS-137 RADIOACTIVE SOURCE ABANDONED
3-3-75 AT 8400 FT. PLUG BACK DEPTH 8200 FT.
DO NOT RE-ENTER THIS WELL BEFORE CONTACTING

DIVISION OF RADIOLOGICAL HEALTH
MISSISSIPPI STATE DEPARTMENT OF HEALTH

Letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the information, e.g., 1/2-inch and 1/4-inch letter size, respectively.