INSPECTION PROCEDURE 87123

WELL LOGGING PROGRAMS

PROGRAM APPLICABILITY: 2800

87123-01 INSPECTION OBJECTIVES

01.01 To determine if licensed activities are being conducted in a manner that will protect the health and safety of workers and the general public.

01.02 To determine if licensed programs are being conducted in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements.

87123-02 INSPECTION REQUIREMENTS

The review of the licensed activities will be commensurate with the scope of the licensee's program. The inspector's evaluation of a licensee's program will be based on direct observation of work activities, interviews with workers, demonstrations by workers performing tasks regulated by NRC, and independent measurements of radiation conditions at the facility, rather than exclusive reliance on a review of records.

The structure and the emphasis of the inspection will be on the following Focus Elements (FE) that describe the outcomes of an effective well logging radiation safety program:

02.01 FE-1. The licensee should control access to and prevent loss of licensed material so as to limit radiation exposure to workers and members of the public to values below 10 CFR Part 20 limits.

02.02 FE-2. The licensee should maintain shielding of licensed materials in a manner consistent with operating procedures and design and performance criteria for devices and equipment.

02.03 FE-3. The licensee should implement comprehensive safety measures to limit other hazards from compromising the safe use and storage of licensed material.

02.04 FE-4. The licensee should implement a radiation dosimetry program to accurately measure and record radiation doses received by workers or members of the public as a result of licensed operations.

02.05 FE-5. The licensee should provide radiation instrumentation in sufficient number, condition, and location to accurately monitor radiation levels in areas where licensed material is used and stored.

02.06 FE-6. The licensee should ensure that workers are:

a. knowledgeable of radiation uses and safety practices;
b. skilled in radiation safety practices under normal and accident conditions; and,
c. empowered to implement the radiation safety program.

02.07 FE-7. The licensee's management system should be appropriate for the scope of use and should ensure:

a. awareness of the radiation protection program;
b. that audits for ALARA practices are performed; and,
c. that assessments of past performance, present conditions and future needs are performed and that appropriate action is taken when needed.

Usually the inspector's evaluation will examine licensee activities back to the date of the previous inspection. However, issues preceding the last inspection should be reviewed, if warranted by circumstances, such as incidents, repetitive violations, or high radiation exposures.

87123-03 INSPECTION GUIDANCE

General Guidance

The following inspection guidance is designed to assist the inspector in evaluating the performance of the licensee's radiation safety program. The guidance is organized by the individual focus elements described above. The timing and sequence of inspection activities are left to the inspector's discretion based on the circumstances and conditions at the time of the actual inspection. Furthermore, inspectors should not feel constrained by the guidance in this procedure. If an inspector obtains information that indicates that a problem may exist in an area within the NRC's jurisdiction that is not specifically addressed in this procedure, the inspector should redirect, or otherwise expend, inspection effort to address that problem. For additional information relating to the evaluation of radiation safety programs, inspectors should refer to Inspection Procedure (IP) 83822, "Radiation Protection."

Some of the requirement and guidance sections of this procedure instruct the inspector to "verify" the adequacy of certain aspects of the licensee's program. Whenever possible, verification should be accomplished through discussions, observations, and demonstrations rather than exclusive reliance on review of records. An examination of the licensee's records should not be considered the primary part of the inspection program.

In the records reviewed, look for trends such as increasing doses. Records such as surveys, waste disposal, receipt and transfer of licensed materials, training, and utilization logs, may be examined randomly until the inspector is satisfied that the records are being maintained and are complete. Other records that are more closely related to health and safety (such as personnel dose-monitoring records and incident reports) should be examined in detail.

Common elements to all inspections include preparation, entrance and exit meetings with appropriate licensee management, including the radiation safety officer (RSO), observations of facilities and work in progress, independent confirmatory surveys, and the evaluation of program scope and any special license conditions. Specific guidance regarding these common elements can be found in IMC 2800.

Each of the following Focus Elements should be reviewed during each inspection of all well logging licensees. Inspectors should select sub-elements for review that are representative of the licensee's scope of use. If the licensee is using byproduct material at a temporary job site, then the inspector should consider those activities for the review of each Focus Element.

Specific Guidance

03.01 FE-1:The licensee should control access to and prevent loss of licensed material so as to limit radiation exposure to workers and members of the public to values below 10 CFR Part 20 limits

Facilities

a. Through direct observation, verify that all entrances to licensee facilities are normally closed, locked or otherwise secured to prevent unauthorized entry. This should include main facility gates, main building entrances, doors to waste storage facilities (if the licensee has used unsealed materials for subsurface tracer studies), etc. The inspector should review the licensee's process for preventing and identifying when radioactive material will be aggregated to category 1 and 2 and must be stored within a licensee-established security zone.

    1. If any entrance or area is unsecured, determine, through questioning of licensee staff, the reason for the area or entrance being unsecured. Determine if the licensee failed to follow established procedures in securing the area or if additional training of staff is needed. Determine if the licensee's facility is configured to separate working areas from unrestricted areas.

    2. If entrances or other areas are unsecured, examine areas where radioactive materials are used and stored. Storage areas must be locked and have limited and controlled access. Radioactive material use areas must be under constant surveillance or physically secured.

2.3. If the licensee's facilities contains category 1 or 2 radioactive material, a security zone must be established to provide for isolation of and access control to the area. [Note-Implement IP 87137, "10 CFR Part 37 Materials Security Programs" if the licensee is storing aggregated quantities of category 1 or 2 radioactive material in their facility.

b. Through observations, verify that use and storage areas, including radioactive waste storage facilities (if the licensee has used unsealed materials for subsurface tracer studies), are locked and have limited and controlled access. At a minimum, radioactive material use areas should be under constant surveillance during normal business hours when licensee personnel are present or physically secured against unauthorized access. Storage areas must be physically secured when unattended.

c. Observe the licensee's operation at a temporary job site. This inspection should be unannounced. If possible, make arrangements with licensee management or the licensee's client to observe the licensee's field operations before announcing your presence.

Through interviews of other workers who are present at the field site, determine their understanding of the licensee's access control. Although these workers may not have or need any knowledge of the licensee's operations, if they were informed of the licensee's operations, i.e., to maintain a practical safe distance from licensed operations, this would be an indication of the licensee's good safety practices. As non-licensees, such persons have no obligation to cooperate with the NRC.

1. If other workers are unaware of basic radiation safety practices, determine if the licensee failed to provide instructions. Assess the role of other workers at the field site and the potential for radiation exposures of unacceptable consequence to other workers.

Receipt and Transfer of Licensed Materials

a. Through observations and interviews of licensee personnel, verify that the licensee: 1) properly secures package receipt areas, such as loading docks or other shipping and receiving areas; 2) inspects packages for damage; 3) performs appropriate package receipt surveys; 4) opens packages in a safe manner; 5) assures that packages are properly prepared for transport; and 6) controls packages in a secure manner prior to pickup by courier personnel or transport by licensee personnel. If unable to observe the receipt of packages, request that personnel who normally receive packages for the licensee to demonstrate package receipt processes and surveys.

1. If packages are left unattended, assess the licensee's receipt procedures, including instructions provided to couriers, to assure that packages are being delivered to the appropriate location(s).

2. If surveys of packages (whether during receipt or preparation for shipment) are not adequate to verify that radiation and contamination levels are within regulatory limits, interview licensee staff and the RSO further to assess worker knowledge. Deficiencies regarding instrumentation should be reviewed in more depth in Focus Element 5 (Section 03.05, below).

b. Through interviews of licensee personnel and review of selected transfer documentation, verify that the licensee has an adequate method of determining that recipients of radioactive shipments are licensed to receive such materials.

Physical Inventory.

a. Through observation, physically examine the inventory of radioactive material on hand and review selected records of receipt and transfer to verify that quantities and forms are as authorized on the license, including Sealed Source and Device (SSD) registry limits.

1. Assess how the licensee ensures that only registered SSD combinations are used.

2. Verify that the licensee's use of byproduct material is limited to that which is authorized in the license. For example, a licensee may not use sealed sources in a well without a surface casing or inject licensed material into a fresh water aquifer except as specifically authorized by the Commission.

3. Verify that the inventory, including radioactive markers (10 CFR 39.37, 39.47) is complete.

b. Through interviews of the RSO and selected licensee personnel, determine whether the licensee has experienced any events since the last inspection, involving lost, missing, or stolen licensed materials.

1. Review and evaluate any such incident or unusual occurrence that took place since the last inspection. If such incidents were required to be reported, verify, through interview of the RSO and review of event reports, that a complete and timely report was made to the NRC.

2. For incidents or unusual occurrences that were not required to be reported, determine that the licensee performed sufficient investigation to identify the cause of the incident, and took appropriate corrections to prevent recurrence of the situation leading to the incident or unusual occurrence.

3. Verify that the licensee has adequate procedures in place for the abandonment of irretrievable sources. Verify that the licensee has a

written agreement with the well owner/operator for recovery or abandonment of sources (10 CFR 39.15).

03.02 FE-2: The licensee should maintain shielding of licensed materials in a manner consistent with operating procedures and design and performance criteria for devices and equipment

Routine and Non-Routine Maintenance

Through interviews of licensee staff and observation of the licensee's equipment, verify that the licensee has inspection and maintenance programs required under 10 CFR 39.43 and that associated records of defects are available. The equipment items involved in the program should include source holders, logging tools, uranium sinker bars, source-handling tools, storage containers, and transport containers. The program should ensure that no physical damage is visible and that the required labeling is legible. Physically examine a representative sample of source handling tools to determine their condition and their ability to adequately secure a source during transfer to and from its source storage container. Physically examine source storage containers to ensure that they are in good condition and that design safety features function as intended.

a. If licensee staff did not check well logging equipment each day before use and semiannually or if physical damage is evident or illegible labels are apparent, assess the licensee's process for completing the checks. Determine how the licensee failed to implement the written procedure.

b. If unauthorized individuals removed sealed sources from source holders or logging tools, assess the licensee's process for dismantling well logging equipment and the potential for radiation exposures. Determine how the licensee failed to implement the written procedure.

c. If individuals were not specifically approved by NRC or an Agreement State to open, remove, or modify a sealed source or to remove (e.g., chisel, drill, or cut) a stuck sealed source from the source holder, assess the licensee's process for performing the operation and the potential for radiation exposures. Determine how the licensee failed to obtain approval from NRC or an Agreement State.

Area Radiation Surveys

Through interviews of selected licensee personnel, including the RSO, verify specifically that schedule and procedural requirements for surveys are adequate to demonstrate compliance with the regulations and with pertinent license requirements. Determine whether due consideration is given to gamma and neutron emissions from the radionuclides involved, and to total body exposure and extremity exposure.

Verify that the licensee has established schedules for periodic surveys of work and storage areas of the facility site. Observe surveys in progress by licensee personnel. Determine the adequacy of the surveyor's knowledge in checking the survey instrument

for proper operation with a dedicated check source and in the use of the instrument for conducting radiation surveys. Review a random selection of survey records to verify that surveys are performed according to schedules; assess that the survey results are reviewed by an appropriate supervisor and that corrective actions have been taken, as appropriate.

Request that licensee personnel spot-check radiation levels in selected areas using the licensee's instrumentation. Compare the results with those obtained using the NRC's instruments.

03.03 FE-3: The licensee should implement comprehensive safety measures to limit other hazards from compromising the safe use and storage of licensed material

The inspector should be attentive to potential industrial safety hazards for referral to the U.S. Department of Labor's Occupational Safety and Health Administration (see Manual Chapter 1007). The focus should be on potential non-radiological hazards personally observed or brought to the inspector's attention by licensee staff.

Operational Limits

Verify that well logging sources are used in accordance with any operational limits described in the applicable SSD sheet. Sources have limits for temperature, pressure, corrosive chemical exposure, etc. Also, inspectors should assess that sources in storage are protected from fire (see "Fire Protection below) and the elements, that package integrity is appropriately maintained, and that controls are in effect to minimize the risk from other hazardous materials.

Temporary Job Site Hazards

During inspections of licensed activities at temporary job sites, verify that licensee personnel ensure that sources are protected from heavy equipment; such as cranes, drill pipe, etc.; welding equipment; high voltage lines; and other industrial hazards.

Fire Protection

In many cases, the risk posed to radiological safety by fires is comparable to or exceeds the risk from other events involving licensed activities. During the course of inspection of the licensee's facilities, be alert to potential fire hazards. An effective licensee fire protection program should (1) prevent fires from starting, (2) rapidly detect, control, and extinguish those fires that do occur, and (3) provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent the licensee from taking actions to safely control licensed material and prevent the spread of contamination and unnecessary exposures to workers or the public.

Through observation and discussion with the licensee, while touring the facilities, assess firesafe conditions and equipment, i.e., that: (1) work areas are generally uncluttered and free of combustible debris, (2) incompatible materials (i.e., materials

labeled as “corrosive”, “flammable”, or “oxidizer”) are isolated from each other and enclosed by fire resistant barriers, (3) fire detection systems are operable, (4) fire suppression systems are operable, (5) portable fire extinguishers are unexpired (check maintenance tags), (6) electric switches and electric motors are explosion-proof, arc welders or open flames are administratively controlled in work areas that also contain flammable or combustible liquids or gases or highly reactive chemicals, and that (7) the local fire department is involved with the licensee’s fire protection program.

Through observations and discussions with licensee staff, assess that: (1) radioactive waste is protected from fire and the elements, (2) package integrity is appropriately maintained, (3) the storage area is ventilated, and (4) controls are in effect to minimize the risk from other hazardous materials.

Any problems/deficiencies noted should be promptly brought to the licensee’s attention and discussed with Regional management.

Licensees should be practical in approaching the safety of the device in the event of fire. They should not endanger themselves to protect the source, but should be able to provide radiological hazard information to emergency medical and fire personnel who respond to the fire.

Industrial/Chemical Hazards

Through observations and interviews of licensee personnel, determine that the licensee controls the use/storage of hazardous (corrosive or combustible) chemicals near well logging equipment which could degrade performance or render safety features inoperable. If the licensee is required to implement an emergency plan, verify that the plan includes these hazards, as appropriate, as initiating events.

Transportation

Verify that licensed material is packaged and transported (or offered for transport) in accordance with 10 CFR Part 71 and U. S. Department of Transportation (DOT) regulations for transportation of radioactive materials. The inspector should refer to IP 86740, "Inspection of Transportation Activities" for further inspection guidance. Also the field reference charts, "Hazard Communications for Class 7 (Radioactive) Materials," are useful for determining compliance with the transportation requirements for minimum packaging, shipping papers, marking and labeling packages, placarding vehicles, and package and vehicle radiation limits and contamination limits.

a. Observe the preparation of radioactive materials for shipment. Verify that the proper packaging is used for the type of materials/devices shipped. Verify that the licensee properly marks and labels packages in accordance with DOT requirements. Verify that the licensee performs appropriate examinations to confirm that package radiation and contamination levels are within applicable DOT limits prior to offering them for transport. Verify that proper shipping papers are prepared for each package/shipment and that, if necessary, the licensee maintains and offers appropriate placards to common carriers.

b. If the licensee tests and certifies its own DOT Type A packaging materials, review test procedures and required certification documentation for selected packages. Verify that the packaging materials are used in the same or similar configurations as in their certification testing.

c. Verify that any DOT Type B containers are used in accordance with their Certificates of Compliance (COCs) issued by the NRC. The licensee must maintain copies of the COCs for the packages that it has used and ensure that it follows the instructions and limitations of the COCs when preparing the packages for shipment.

d. If the licensee reported any transportation incidents, review the licensee's actions in response to the incidents.

e. In the case where a licensee may have transferred a source to a burial site for offsite disposal, review the licensee's procedures and records to verify that each shipment is accompanied by a shipment manifest that includes all the required information. Also review the licensee's procedures and records to verify that each package intended for shipment to a licensed land disposal facility is labeled, as appropriate, to identify it as Class A, B, or C waste in accordance with the classification criteria of 10 CFR 61.55 [Subsection III.A.2 of Appendix G to Part 20]. Verify that records are maintained that demonstrate compliance with the requirements for the disposal of licensed material made under 10 CFR 20.2002-2005, 10 CFR Part 61, and disposal by burial in soil. For further inspection guidance, refer to IP 84850, "Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61."

03.04 FE-4: The licensee should implement a radiation dosimetry program to accurately measure and record radiation doses received by workers or members of the public as a result of licensed operations

A radiation dosimetry program includes all of the licensee's activities that measure the radiation dose to workers and members of the public as the result of licensed activities. These activities would include for example, the measurement of quantities of licensed materials present, radiation and contamination levels, and the concentration of licensed materials in effluent streams. For additional guidance relating to personnel dosimetry, refer to Inspection Procedure (IP) 83822, "Radiation Protection."

Personnel Dosimetry

a. Through interviews of the RSO, determine whether the licensee had made a prospective analysis of anticipated annual doses (internal and external) to workers. If the licensee's analysis indicated that monitoring was not required, verify the assumptions and outcomes.

b. If the licensee monitors worker exposures (internal and external), notwithstanding a prospective analysis indicating that monitoring was not required, review selected reports of monitoring results. Verify, based on the review of reports of monitoring results, that worker doses adequately reflect the nature and scope of the licensee's activities.

   1. If monitoring results do not reflect the nature and scope of the licensee's activities, or if there is wide variability in the range of doses for specific job categories (i.e., one worker consistently receives significantly more exposure than all other workers each month), discuss this variability with the RSO to determine that he/she is aware of the disparity.

   2. Through interviews of workers and observations of activities in progress, determine the basis for the disparity in doses or verify the RSO's assessment of the disparity.

c. Through interviews of workers and observations of activities in progress, verify that radiation monitors are worn appropriately and are recording the highest dose for which they are intended.

   1. If monitors are not (or cannot be) worn in the most appropriate location to record the highest dose received by the individual(s), through interviews of the RSO, verify that the licensee has performed assessments (through surveys, calculation, or both) of occupational exposures received and adjusted the dose of record for the worker(s).

   2. Review the results of the licensee's assessment and verify the assumptions and outcomes. Verify that the dose of record for the affected worker(s) has been adjusted and that the adjusted dose is within the applicable regulatory limit and ALARA.

d. Through interviews of the RSO and review of records of external monitoring results, determine whether processing (collection, process, and assessment) of monitoring devices is being performed in a timely manner.

e. Through interviews of the RSO and workers who handle volatile radionuclides (i.e., radioiodine), verify that the licensee has established an appropriate monitoring frequency for the identification of intakes of radioactive materials. Verify that the licensee has established administrative action levels for investigating intakes. Through a review of bioassay records, verify that, when those levels are exceeded, the licensee appropriately investigates the intakes. Verify that the licensee's process for converting intake measurements to dose uses appropriate calculations and methodologies. [Note–the unsealed radionuclides used for subsurface tracer studies are generally non-volatile.]

f. Through reviews of dosimetry reports and annual licensee evaluations of public dose, and interviews of the RSO and selected licensee personnel, verify that the licensee has not experienced any events, since the last inspection, involving

exposures to occupational workers or members of the public that were in excess of any regulatory limit.

1. Review and evaluate any such incident or unusual occurrence that took place since the last inspection. If such incidents were required to be reported, verify, through interview of the RSO and review of event reports, that a complete and timely report was made to the NRC.

2. For incidents or unusual occurrences that were not required to be reported, verify that the licensee performed sufficient investigation to identify the cause of the incident, and took appropriate corrections to prevent recurrence of the situation leading to the incident or unusual occurrence.

Contamination Control

Through interviews of selected licensee staff, including the RSO, the inspector should verify that personnel have an adequate understanding of the procedures to be followed in the event that the licensee's sources are ruptured or licensed materials have caused contamination. Occasionally, well logging tools containing sources become lodged, or otherwise immobilized in the well. When this happens, operations are initiated to retrieve the tools from the well. The inspector should verify that the drilling fluids (mud) are monitored for radioactive materials whenever retrieval operations are ongoing.

Note that, in accordance with 10 CFR 39.67, the licensee is required to make radiation surveys of each area where licensed materials are used and stored. In particular, the licensee is required to perform a radiation survey at temporary job sites before and after each subsurface tracer study, to confirm the absence of contamination. Licensees must be authorized to knowingly inject radioactive materials into fresh water aquifers. If practical, observe how licensees conduct surveys to determine the adequacy of such surveys. Also, note the types of instruments used, and whether they are designed and calibrated for the type of radiation being measured.

The inspector should determine if workers take smears or instrument readings in areas that are potentially contaminated and accessible to facility personnel. Particular attention should be given to well heads and storage areas. The inspector should also perform independent measurements, as needed, to verify licensee assumptions or measurements.

Leak Tests

Through discussions with licensee personnel and/or by demonstration of leak test procedures, verify that leak tests are performed in accordance with the manufacturer's recommendations and/or license. In accordance with 10 CFR 39.35, verify that the wipe of a sealed source is taken from the nearest accessible point to the sealed source where contamination might accumulate, at intervals not to exceed 6 months (or other frequencies in accordance with the sealed source and device evaluation certificate).

Verify that the licensee's leak test analyses (or that of it is leak test services vendor) has sufficient sensitivity to measure 185 Becquerels (0.005 microcurie) for each type of isotope present on its license. Through discussions with licensee staff and/or review of pertinent records, determine if the licensee had a leaking source. If leak test results show contamination in excess of the regulatory limits, verify that the licensee made appropriate notifications, evaluations, and removed the source from service.

03.05 FE-5: The licensee should provide radiation instrumentation in sufficient number, condition, and location to accurately monitor radiation levels in areas where licensed material is used and stored

Through observations of portable radiation detection and measurement equipment in use and available for use, determine whether the quantity and type are adequate for the licensee's radiation detection and measurement needs. Verify that instruments used to meet regulatory requirements (i.e., area and transportation surveys; bioassay and leak test analyses) have been routinely calibrated and maintained.

Survey Instruments

a. Through observations and demonstrations, determine whether selected licensee survey instruments in use and available for use are operational (battery check) and respond appropriately to radiation (instrument source check). Compare licensee instrument readings to the NRC instrument. Verify that licensee's instrument response is comparable to the NRC instrument (+20%).

b. Through interviews of the RSO and workers, and by observation, determine whether the licensee has a system for tagging out inoperable and out-of-service survey instruments.

Instrument Calibration and Maintenance

a. If the licensee uses a vendor to calibrate instruments, verify through interviews of the RSO that the vendor is authorized by the NRC or an Agreement State to perform that service.

b. Through interviews and demonstrations, determine that licensee personnel who perform in-house instrument calibrations are knowledgeable of the calibration procedures for each type of instrument used by the licensee. Assess that calibrations include a determination of "as found" condition before adjustments are made. Assess that personnel understand how to maintain their doses (deep dose and extremity) ALARA during calibration procedures, especially if large activity sealed sources are used.

c. If the licensee performs maintenance/repair on survey instruments, through interviews of appropriate licensee personnel and the RSO, determine whether the licensee possesses instrument manufacturer manuals and that any replacement parts used are "like-for-like."

Bioassay Instruments

Through observations and interviews of the RSO and workers, verify that the licensee's instrumentation for performing in vivo bioassay measurements is adequate for those measurements. Determine that bioassay probes and scalers are compatible. Determine that licensee staff perform a response check using appropriate sources (such as a barium-133 source to simulate iodine-131) and a suitable background measurement before taking bioassay measurements.

Leak Test Analysis

If the licensee is authorized to both collect and analyze leak test samples, the inspector should determine if the type of counting equipment is appropriate for the samples being analyzed and the sensitivity required. The inspector should determine if the laboratory instrumentation is calibrated for the appropriate geometries of the samples to be analyzed and is routinely checked for proper operation. The licensee should maintain calibration records, control charts, and maintenance and repair records, to demonstrate proper operation of laboratory instrumentation.

03.06 FE-6: The licensee should ensure that workers are knowledgeable of radiation uses and safety practices; skilled in radiation safety practices under normal and accident conditions; and empowered to implement the radiation safety program

a. Authorized Users. Authorized users (logging supervisors and logging assistants) may either be named in the license application or be appointed by the licensee, depending on the type of license issued and/or the wording in the license. For those appointed by the licensee, verify that the authorized user is trained in accordance with the approved criteria and has knowledge commensurate with operational duties.

   Through observations and interviews of logging supervisors and logging assistants, assess implementation of radiation safety practices for well logging activities (i.e., loading of sources into tools, leak-testing procedures, maintenance activities). Verify their ability to recognize unsafe radiological conditions and to respond appropriately to emergency situations. Also verify that logging supervisors and logging assistants understand the mechanism for raising safety concerns to licensee managers.

   Review selected training records to determine that examinations or tests (if applicable) have been implemented and are appropriate. Read a few of the examination questions to ascertain that they are indicative of what the worker should know to carry out his/her responsibilities.

   Note that, at a minimum, the licensee is required to provide safety reviews, as defined in 10 CFR 39.2, for logging supervisors and logging assistants at least once during each calendar year.

b. General Training. Verify, pursuant to 10 CFR 19.12, that initial instructions have been given to workers who in the course of employment are likely to receive in a year an occupational dose in excess of 1 mSv (100 mrem). Under the basic instructions, it is management's responsibility to inform the workers of the storage, transfer, or use of radiation and/or radioactive material; health protection problems associated with exposure to radiation; precautions or procedures to minimize exposure; and the purposes and functions of protective devices employed. The workers should also be informed of the pertinent provisions of NRC regulations and the license, and the requirement to notify management of conditions observed that may, if not corrected, result in a violation of NRC requirements.

c. Operating and Emergency Procedures. Operating and emergency procedures will be found in license applications and may vary from step-by-step procedures to more generalized procedures. The emergency procedures will be approved by the NRC, and reviewed and updated by the licensee. Any revision requires an amendment to the license.

Some licensees may have agreements with other agencies (i.e., fire, law enforcement, and medical organizations) regarding response to emergencies. Discuss with the licensee's representatives what has been done to ensure that agencies (involved in such agreements) understand their roles in emergency responses.

Verify that licensee personnel are knowledgeable of the operational procedures by observing the performance of tasks at selected work stations and by a comparison of their performance with established procedures. Determine that the licensee's emergency procedures have been approved by or described to NRC. Through discussions with workers, assess that licensee personnel understand and implement the established procedures and are aware of procedural revisions. Determine the licensee has adequate procedures in place for handling irretrievable, abandoned sources.

Through discussions with licensee staff, assess the licensee’s handling of tracer materials. Verify, when practical (and when required), that well logging personnel wear appropriate protective clothing during their work activities. Requirements for protective clothing may be found in the licensee's procedures. Assess that all waste items (i.e., empty vials, gloves, napkins, cans, etc.) are appropriately packaged, labeled, and transported from the job site to the licensee's waste storage location, and that the licensee has appropriate methods to track the items in storage.

d. Posting and Labeling. Determine that proper caution signs are being used at access points to areas containing licensed materials and radiation areas. Section 20.1903 provides exceptions to posting caution signs. The inspector should also randomly observe labeling on packages or other containers to determine that proper information (e.g., isotope, quantity, and date of measurement) is recorded.

Observe locations where notices to workers are posted. Applicable documents, notices, or forms should be posted in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the postings would apply.

03.07 FE-7: The licensee's management system should be appropriate for the scope of use and should ensure awareness of the radiation protection program; that audits for ALARA practices are performed; and that assessments of past performance, present conditions, and future needs are performed, and that appropriate action is taken when needed

The NRC holds the licensee responsible for the radiation protection program; therefore, it is essential that strong management controls and oversight exist to ensure that licensed activities are conducted properly. Management responsibility and liability are sometimes under emphasized or not addressed in applications and are often poorly understood by licensee employees and managers. Senior management should delegate to the RSO sufficient authority, organizational freedom, and management prerogative to communicate with and direct personnel regarding NRC regulations and license provisions and to terminate unsafe activities involving byproduct material.

Through observations, interviews and the review of selected records, determine that senior licensee management is fulfilling its responsibility of ensuring the effective operation of the radiation safety program. Specific areas of management focus should include:

- Maintaining awareness of significant events such as the loss or theft of licensed materials.
- Maintaining radiation safety, security and control of radioactive materials, and compliance with regulations.
- Committing adequate resources (including space, equipment, personnel, time, and, if needed, contractors) to the radiation protection program to ensure that members of the public and workers are adequately protected from radiation hazards and that compliance with regulations is maintained.
- Obtaining the NRC's prior written consent before transferring control of the license;
- Notifying the appropriate NRC regional administrator in writing, immediately following filing of petition for voluntary or involuntary bankruptcy (10 CFR 30.34(h)).
- Assuring the appropriate response, when applicable, to generic communications from the NRC.
- Assuring that adequate provisions have been made to fund the safe and effective decommissioning of licensee facilities. (10 CFR 30.35)
- Notifying the NRC of the decision to discontinue licensed activities or to decommission a facility in which licensed activities took place. (10 CFR 30.36)
- Notifying the NRC of defects or other radiation safety equipment malfunctions in accordance with the requirements of 10 CFR Part 21.
- Maintaining awareness of issues and measures to ensure worker performance and safety are not being compromised due to safety significant human performance issues.

a. RSC (where required or used). Through the review of records, and interviews of the RSO and RSC members, determine that the committee is made up of a representative from each type of program area, the RSO, and a representative from management. If practical, attend and observe the conduct of an RSC meeting. Review meeting minutes (and interview selected committee members when practical) to determine the committee's effectiveness. Determine that the RSC meets at the required frequency as specified in the license application, other commitment documents, or in a specific license condition. Topics of discussion during committee meetings should include ALARA reviews, incidents, generic communications, authorized users and uses, waste issues, audits, etc.

Determine if the committee has been effective in seeking out areas needing improvement, rather than just responding to events and information from outside sources. Determine whether the RSC has recommended any specific actions and assess the implementation of those recommendations. The inspector's review should be of sufficient depth and detail to provide an overall assessment of the committee's ability to identify, assess, and resolve issues. Also consider the effectiveness of the RSC to communicate the results of audits and trend analyses to appropriate personnel performing licensed activities.

b. RSO. Through the review of records, and interviews of the RSO and authorized users, verify that the RSO has been appointed by licensee management, identified on the license, and is responsible for implementing the radiation safety program. Determine, through interviews, that this individual is knowledgeable about the program, and ensures that activities are being performed in accordance with approved procedures and the regulations. Determine that, when deficiencies are identified, the RSO has sufficient authority, without prior approval of the RSC or licensee management, to implement corrective actions, including termination of operations that pose a threat to health and safety.

Determine that the knowledge and training of any radiation safety staff are commensurate with their assigned duties. Verify that the radiation safety staff levels, including numbers and types of positions, are as described in the license application.

1. If the inspector identifies high staff turnover or prolonged shortfalls in staffing levels, through interviews and observation determine if these shortfalls have had a negative impact on licensee performance.

2. If so, discuss these findings with the RSO and senior licensee management to determine the source of the staffing issues and the licensee’s plans to address the deficiency. The issue should also be brought to the attention of regional management.

c. Audits. Through reviews of audit records and interviews, verify that the radiation safety program content and implementation is reviewed at least annually. The results of all audits must be documented in accordance with 10 CFR

20.2102(a)(2). Examine these records with particular attention to deficiencies identified by the licensee's auditors, and note any corrective actions taken as a result of deficiencies found.

1. If no corrective actions were taken, determine why the licensee disregarded deficiencies identified during audits.

2. Determine if the lack of corrective actions caused the licensee to be in non-compliance with regulatory requirements.

87123-04 REFERENCES

A listing of IMCs and IPs, applicable to the inspection program for materials licensees, can be found in IMC 2800. These documents are to be used as guidelines for inspectors in determining the inspection requirements for operational and radiological safety aspects of various types of licensee activities.

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