



Environmental Health

Guide for the Preparation of Radioactive Material License Applications for Well Logging

3/29/2018

*Kansas Department of Health and Environment
Radiation Control Program
1000 SW Jackson, Suite 330
Topeka, Kansas 66612-1365*

INTRODUCTION

A. Licensing Process

The Nuclear Energy Development and Radiation Control Act of 1963 charges the Kansas State Department of Health and Environment with, among other things, responsibility for regulating the receipt, possession, and use of radioactive materials. The Department authorizes the possession and use of radioactive material as it may deem necessary or desirable to protect health or to minimize danger to life or property. The Department issues such authorization as a license. A license indicates what type, quantity, form, and use of radioactive material is authorized and any special conditions under which the radioactive material shall be used.

B. Purpose

This guide describes the process for application for a license and for the amendment, renewal, and termination of the license.

C. Contact

Kansas Radiation Control Program can be contacted via telephone, email, mail, fax or in person. In addition most information can be found on the Department's website:

Phone: (785) 296-1560

Email: kdhe.ram@ks.gov

Fax: (785) 296-0984

Address: 1000 SW Jackson St., Suite 330; Topeka KS, 66612

APPLICABLE REGULATIONS

General requirements for issuance of a specific license are contained in 28-35-180a of Part 3. Also use the following sections as they apply

Part 1, "Definitions"

Part 3, "Licensing of Sources of Radiation."

Part 4, "Standards for Protection Against Radiation."

Part 7, "Special Requirements for Industrial Radiographic Operations."

Part 10, "Notices, Instructions and Reports to Workers: Inspections."

Part 11 "Wireline and Subsurface Tracer Studies."

All regulations can be found at the Department's website:

<http://kdheks.gov/radiation/regs.html>

FILING AN APPLICATION

A. General

The regulations, this guide, application forms and other guidance are available at the Department website: www.kdhe.gov/radiation. Each applicant must submit the following when filing an application for a Radioactive Materials license:

1. Form RH-1 Application for Radioactive Materials License
2. Supporting documents as required
3. Appropriate license fee

B. Submission

Completed applications should be submitted to the Department. License fees may be submitted separately but the license application will not be processed until the fee is received. State licensees are required to comply with all rules, regulations, license conditions and the content of their submitted applications. Licensees should retain a copy of all information submitted to the Department with the license application, as well as with any amendment, renewal or termination request.

CONTENTS OF AN APPLICATION

The following comments apply to the indicated items of Kansas Form RH- 1:

Item 1a. - Name and Street Address Of Applicant

You the applicant, should be the corporation or other legal entity applying for the license. If you are an individual, you should be designated as the applicant only if you are acting in a private capacity and the use of the radioactive material is not connected with your employment with a corporation or other legal entity.

The address specified here should be your mailing address for correspondence. This may or may not be the same as the address at which the material will be used, as specified in Item 1b.

Item 1b. - Locations of Use

List the location(s) where the material will be stored. This address must be a physical address, a P.O. Box is inappropriate for this item. Since well-logging operations involve travel away from a home base, indicate that materials will also be used at temporary job sites.

Item 2. - Department to Use Radioactive Material

State the department requested, if applicable.

Item 3. - Previous License Number(s)

State according to directions on application form.

Item 4. - Individual Users

As indicated in the application, give name and titles of individuals who will use or supervise the use of radioactive materials.

Item 5. – Radiation Protection (safety) Officer

A qualified individual should be designated the responsibility for radiation protection. The individual designated as Radiation Protection or Safety Officer (RSO) is normally an individual user, supervisor, or other individual who will maintain the license and have overall responsibility for the radiation protection program. The applicant should detail the named individual's duties and responsibilities. The RSO is expected to coordinate the safe use of the radioactive material and to ensure compliance with the requirements of the Kansas Radiation Protection Regulations.

Item 6a. - Radioactive Material

List the radioisotopes you wish to possess.

Item 6b. - Chemical and/or Physical Form and Maximum Quantity of Each Chemical and/or Physical Form That You Wish to Possess at Any One Time

Identify each sealed source by isotope, manufacturer, and model number. Also include the activity (quantity) of radioactive materials to be possessed at any one time for each isotope. Either a total possession limit may be used or a total limit per source may be used.

Item 7. - Describe Purpose for Which Radioactive Material Will Be Used

Specify the purpose for which the licensed material will be used.

Item 8. - Type of Training - Training and Experience of Individuals Named In Item 4.

Specify the types of training each individual who will utilize radioactive material has received according to subsections a, b, c, and d of the application form.

Item 9. - Experience with Radiation (Actual Use of Radioisotopes Or Equivalent Experience)

This section should be filled out to indicate the experience of all personnel directly using or supervising the use of radioactive materials. Information supplied should include when material was used, for what time periods, types of isotopes used, strength of isotopes, etc.

Items 10. - Radiation Detection Instruments

Each radiation survey instrument used in licensed activities should be calibrated at intervals not to exceed one year and after each instrument servicing. A calibration should be performed if there is reason to suspect damage to the instrument as a result of an accident (vehicle accident or dropping of meter).

Instrumentation and survey methods used during tracer studies should be sufficiently sensitive to detect the radioisotopes being monitored. A thin-end window (less than 2 mg/cm²) GM detector should be used for beta-emitting radioisotope tracer contamination surveys.

The applicant should specify for each type of radiation detection instrument available to the program: The manufacturer's name and model numbers, the number of instruments available, the type of radiation detected (alpha, beta, gamma, and/or neutron), and the sensitivity range in milliroentgens per hour or counts per minute. For instruments to be used for surveys, the instrument should have a capability of measuring a minimum of 0.1 milliroentgens per hour.

The applicant should submit details if the use of a logging tool as a survey instrument is proposed, including the radiation detected and the sensitivity range.

List any other radiation detection instruments available which are not routinely used for health physics surveys or monitoring.

Item 11. - Method. Frequency And Standards Used In Calibrating Instruments

Instrument calibration provisions should be detailed in the application. The applicant should state the calibration frequency and describe the methods and procedures for calibration of survey and monitoring instruments. This also includes any other instruments and systems used in the radiation protection program such as measuring instruments used for assay, bioassay and/or sealed-source leak-test samples.

If instrument calibration will be performed by an organization other than the applicant, the name of the organization and the calibration frequency should be included in the application.

If the applicant wishes to calibrate instruments, the following information should be submitted:

1. The type (radioisotope, manufacturer and model number) and activity of the source to be used and the manufacturer and model number of the device.
2. The specific procedures to be used for calibration, including radiation safety procedures to be followed for use of the source. These procedures should include sample calculations to demonstrate an understanding of how to establish the exposure rate at a given distance and sample calculations to demonstrate an understanding of how to correct for source decay.
3. The name and pertinent experience of each individual who will perform instrument calibration.

Item 12. - Film Badges. Dosimeters' and Bioassay Procedures Used

Describe the types of personnel monitoring employed. For each dosimeter: specify the type of radiation detected, company supplying the dosimeter, exchange intervals, and donning procedure

Film badges, TLD or equivalent personnel monitoring devices are recommended for

well-logging operations. Use of these devices with monthly evaluations is an acceptable practice.

If the use of pocket dosimeters is proposed, the applicant should provide the name of the manufacturer, type, model number and range (mR), and frequency of reading and recording.

During tracer studies, bioassays (thyroid checks, urinalysis, etc.) may be required when individuals work with multi-millicurie quantities of iodine-131, depending on the type of work, equipment used, and procedures followed. For example, if an individual handles 50 millicuries of iodine-131 per week in unsealed form, thyroid checks should be made. Such criteria to be used in determining the need for bioassays and the type of bioassays that will be performed should be described. If a commercial bioassay service is to be used, the name and address of the firm should be provided.

Item 13. - Facilities and Equipment

Regulation 28-35-180a states that an application will be approved if, among other things, the applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property.

Describe the facilities to be used to ensure security and safe storage of materials. Sources of radiation must be stored in a manner which will minimize danger from explosion and/or fire. This provision is considered necessary to reduce the probability of damage to sources of radiation stored in the proximity of explosives frequently used in well-logging operations, and in the event of fire. U.S. Department of Transportation regulations prohibit the storage and transportation of radioactive materials with Class A and other specified explosives.

In describing available facilities, the applicant should submit the information necessary for each component of operations as it applies to the license:

Sealed Source Programs Storage

The description of field office, site or vehicular storage containers and facilities; include drawings or sketches. Describe the design dimension, thickness or shielding, type of shielding materials (concrete, steel, lead, etc.), and means for securing sources from unauthorized removal. State the expected radiation levels at the surface of containers and accessible areas of storage facilities. Describe laboratories or field office facilities that are to be maintained as restricted areas for survey instrument and logging tool calibration and repairs.

Tracer Operations Facilities

If tracer samples are not to be purchased in ready-to-use form, laboratory or field office facilities that are to be maintained as controlled areas for sample preparation should be described, including sketches. Hoods, sinks, trays with absorbent materials, remote handling tools, rubber gloves, etc., that will be available at these laboratory sites should also be described.

Describe storage facilities and include drawings or sketches of the rooms, buildings,

pits, - etc. Indicate shielding materials (concrete, steel, lead, earth, etc.) and means for securing materials from unauthorized removal. Storage facilities should be designed, and materials positioned so that radiation levels do not normally exceed 2 milliroentgens per hour at 18 inches from the exterior surface of the storage facility in order to meet the criteria for an uncontrolled area.

In addition to the permanent storage facility, please provide a detailed description of the precautions that will be taken for storage of material at temporary jobsites. This should include the following:

Contamination Surveys

1. A detail of the storage vault or container that is provided on transporting vehicles, including dimensions and shielding information.
2. Posting of temporary storage facilities.
3. Precautions that will be taken to prevent unauthorized removal of radioactive material from temporary storage facilities.
4. Precautions that will be taken during transport. Transport containers shall be physically secured to the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

Item 14. - Radiation Protection Program

Describe in detail the procedure used for determining if contamination is present on the logging tool after the completion of each log. The logging tool and well site should be surveyed for contamination when logging tools are removed from the hole and after the source has been removed from the logging tool. The survey may be performed with a survey meter or by energizing the logging tool after the source has been removed. Methods and instruments used in surface contamination surveys should be sufficiently sensitive to detect the nuclides being monitored. Records of contamination surveys shall be maintained for inspection by the Department.

The Kansas Radiation Protection Regulations do not specify limits for surface contamination. Each applicant may propose and justify the levels of removable surface contamination that will be allowable before decontamination must be performed. These limits should be based on the need to avoid transfer of significant amounts of contamination to uncontrolled areas and to maintain exposures as low as is reasonably achievable. Emergency instructions should be established in case contamination is detected. Decontamination procedures should be provided by the applicant.

Radiation Area Surveys

Indicate in detail the methods and occasions for conducting radiation surveys. Detail the procedures employed to assure that personnel exposure is kept to a minimum during source handling. (Refer to Appendices A and/or B of this guide.) Indicate in detail the procedure employed to assure that the source has been returned to its storage container after use for a log. In addition, indicate what records are maintained for this survey. Please submit the format used for these records.

Describe the procedure, the frequency of the procedure, and the instrument used for

performing surveys for the purpose of determining radiation levels at the storage location and what quantities of radioactive material are used. Specify what records will be maintained.

Environmental Surveys

Environmental surveys are required if radioactive tracer materials are used. In the event of a spill or a well-head ejection of radioactive material, detailed procedures should be on hand for clean-up, decontamination, and environmental and follow-up surveys. The applicant should submit these procedures with or as a part of their Health Physics Program. Environmental surveys are not applicable with the use of sealed radioactive sources.

Leak Tests

Regulation 28-35-279 contains the requirements for leak-testing sealed sources. The options for leak testing are:

1. Engage the services of a consultant or commercial facility to take samples, evaluate the samples, and report the results to you. Specify the name, address, and license number of the consultant or commercial organization.
2. Use a commercial leak-test kit. You take the smear and sent the smear to the kit supplier, who reports the results to you. Specify the kit model number and the name, address, and license number of the kit supplier. If the sample will be taken by individuals in your organization who have management or supervisory responsibilities, the names of the individuals should be specified. If radiographers will take the test sample, include instructions for taking the sample in your operating and emergency procedures. Include in the instructions a requirement that any indication of possible source leakage should be reported to management for appropriate action.
3. You perform the entire leak-test sequence, including taking the smears and measurement. Specify how and by whom the test sample will be taken, the instrumentation that will be used for measurement, and the individual who will make the measurement and his or her qualifications. An instrument capable of making quantitative measures should be used. Hand-held survey meters will not normally be considered adequate for measurements. A sample calculation for conversion of the measurement data to microcuries should be included.

Health Physics Program

The applicant should describe the radiation protection program that will be implemented to ensure safe use of radioactive materials. The applicant should submit a copy of the operating and emergency procedures that individuals will follow in the use of radioactive material. Appendix A describes the elements of an acceptable radiation protective program for the use of sealed sources. Similarly, Appendix B describes the elements of an acceptable radiation protection program for tracer use of radioactive materials.

Item 15. - Waste Management

The applicant should describe the procedures for disposing of radioactive material.

1. Sealed Sources - Sealed sources containing radioactive material should be returned to the manufacturer or transferred to another licensee authorized to possess the specific quantity and from being transferred. Please note that the loss and subsequent abandonment of a radioactive source down-hole constitutes disposal, and must be indicated in disposal records.
2. Tracer Operations - Wastes from tracer operations such as unused materials, contaminated tissues, gloves, tools, clothing, containers, etc., should be disposed of in accordance with the Kansas Radiation Protection Regulations.

Short, half-life materials may be stored to allow decay to background radiation levels. Containment and security during storage should be provided.

A commonly used method of disposal is transfer to a commercial firm licensed to receive radioactive wastes.

Spills should be cleaned up and, if possible, injected into the well. Any wash water used to clean up or decontaminate equipment should be treated as radioactive waste.

If wash water is discharged into a sanitary sewerage system, the dilution of the activity by the sewerage must be such that the limit established for such disposal by Regulation 28-35-232a Appendix A of the Kansas Radiation Protection Regulations is not exceeded. If you do not have the capability of assaying the wash water for the concentration of contaminant in microcuries per milliliter, the amount of tracer material actually used on the job and the water consumption must be used to determine that limits are not exceeded.

If the wash water is discharged into a holding tank, then the surface of the fluid in the holding tank shall be surveyed after each such decontamination operation, and if any activity above background is noted, the tank shall be posted with a radiation warning sign alerting everyone concerned of the possible hazard.

Whatever methods of waste disposal are used, records reflecting the final disposition of all radioactive materials must be maintained for inspection by the Department.

Item 16. - Certificate

Your application should be dated and signed by a representative of the corporation or legal entity who is authorized to sign official documents and to certify that the application contains information that is true and correct to the best of your knowledge and belief. Unsigned applications will be returned for proper signature.

AMENDMENTS TO A LICENSE

After you are issued a license, you must conduct your program in accordance with:

1. The statements, representations, and procedures contained in your application

2. The terms and conditions of the license.
3. The Kansas Radiation Protection Regulations.

It is your obligation to keep your license current. You should anticipate the need for a license amendment insofar as possible. If any of the information provided in your application is to be modified or changed, submit an application for license amendment. In the meantime, you must comply with the terms and conditions of the license until it is actually amended; you may not implement changes on the basis of a submission requesting an amendment to your license.

Examples of the more common amendments to licenses include:

1. Addition of a new source.
2. Change in your organizational structure.
3. Addition of a new location of use or storage.

For example, if you wish to add a new source/device/source changer combination, you should review your operating and emergency procedures to ensure that changes are made to accommodate the new equipment, including instruction for use and daily inspection. Quarterly inspection and maintenance and leak-testing need to be considered.

Similarly, in your application for a license amendment, you should consider the impact that the change will have on other documents. Any necessary modification of documents or procedures should be submitted so that additional correspondence will not be necessary.

An application for a license amendment may be submitted either on the application form (RH- 1) or in letter form (in duplicate) and sent to the address specified on the front of this guide. Your application or letter should identify your license by number and should clearly describe the exact nature of the changes, additions, or deletions. You should make clear and specific references to previously submitted information and documents, and you should identify the pertinent information by date, page, and paragraph. For example, if you wish to make a change in the individual responsible for your radiation safety program, your application for a license amendment should not only specify the name of the new individual but also include his or her training and experience. Moreover, the qualifications for the new individual should be equivalent to those specified in item 7 of this regulatory guide.

RENEWAL OF A LICENSE

Licenses are issued for a period of up to 5 years. You should send an application for renewal to the address specified in this guide. The renewal will be an entirely new application as if it were an application for a new license without referring to previously submitted information.