Radioactive Material License Guide

Academic Licensing

Louisiana Department of Environmental Quality
Radiation Licensing & Registrations Section
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RADIOACTIVE MATERIAL LICENSE APPLICATION

INSTRUCTIONS AND LICENSING GUIDE

ACADEMIC INSTITUTIONS
LIMITED SCOPE

A. Any section in the application, which is not applicable, should be designated with N/A.

B. Material submitted on a separate attachment should be clearly identified; for example, Attachment A, Page 5, Item C.

C. If applying for amendment to existing license, information previously submitted may be referenced.

D. The original application should be mailed to the Department, P. O. Box 4312, Baton Rouge, LA 70821-4312.

LICENSE FEES:

A fee is required for all initial applications and for licenses that are required to be reissued. Refer to fee schedule in LAC 33:XV.Chapter 25 to determine the amount of the fee that must accompany the application. Review of the application will not begin until the proper fee is received by the Department. If you have any questions concerning the fee or the amount to submit, please do not hesitate to contact the Department.

FILING AN APPLICATION:

A license application for radioactive material should be submitted on Form DRC-11, Application for Radioactive Material License and Form DRC-13. The applicant should complete all items on the application form delineated in this licensing guide.

Submit one copy of the application and all attachments to the Department. The applicant should retain one copy, since the license will require as a condition that the institution follow the statements and representations set forth in the application and any supplements following. Since the space on Form DRC-11 may not be sufficient to contain all of the required information, additional sheets should be attached. Each separate sheet or document submitted with the application should be identified by heading indicating the appropriate item number. When completed, Form DRC-11 should be signed and dated by a representative of the institution's management.

ALARA PROGRAM

Each licensee shall develop and implement a written program to maintain radiation doses and releases of radioactive material in effluents to unrestricted areas as low as reasonably achievable in accordance with LAC 33:XV.406.

To satisfy this requirement:

1. the management, radiation safety officer, and all authorized users shall participate in the establishment, implementation, and operation of the program as required by these regulations; or

2. for licensees that are not medical institutions, management and all authorized users shall participate in the program as required by the radiation safety officer.

The ALARA program shall include an annual review by the radiation safety committee for licensees that are medical institutions, or by management and the radiation safety officer for licensees that are not medical institutions, of summaries of the types and amounts of radioactive material used, occupational dose reports and continuing education and training for all personnel who work with or in the vicinity of radioactive material. The purpose of the review is to ensure that individuals make every reasonable effort to maintain occupational doses, doses to the general public, and releases of radioactive material as low as reasonably achievable, taking into account the state of technology and the cost of improvements in relation to benefits.

The licensee shall retain a current written description of the ALARA program for the duration of the license. The written description shall include:

1. A commitment by management to keep occupational doses as low as reasonably achievable;

2. a requirement that the radiation safety officer brief management once each year on the radiation safety program;

3. personnel exposure investigational levels that, when exceeded, will initiate an investigation by the radiation safety officer of the cause of the exposure and a consideration of actions that might be taken to reduce or eliminate the probability of recurrence.

Please submit a copy of your ALARA program for the Department's review.

FORM DRC-11

APPLICATION FOR RADIOACTIVE MATERIAL LICENSE

Item 1 Enter the name of the firm applying for the license, the mailing address, telephone number, fax number, and email address.

Item 2 Check "New License" (or "Amendment", if already licensed).

Item 3 List all addresses and locations where radioactive material will be used or stored if other than in Item 1, e.g., university-owned farm, second campus, research station. A post office box number should not be stated as the address for a place of use. These addresses and locations will become part of the license conditions, if the license application is approved, and the addresses or locations at which radioactive materials are located or stored may not be changed without obtaining a license amendment.

Item 4 - List all individuals who will use or directly supervise the use of radioactive material. Give the title of position and describe the training and experience of each individual as outlined on Form DRC-13, "Radiological Qualifications and Training". List all departments or similar subdivisions of the institution where radioactive material will be used, e.g., biology, physics, chemistry, department of research.

Item 5 - Personnel Monitoring:

State the name of the organization furnishing film badge or thermoluminscent dosimeter (TLD) service and specify the frequency with which the badges are changed and evaluated. If pocket chambers or pocket dosimeters are used, state the useful range, frequency of reading, and the procedures for maintaining and calibrating the devices.

Item 6a Contamination Surveys:

Please provide a description of the routine survey program, including the areas to be surveyed for contamination, sample collection methods, and counting technique including the equipment that will be utilized. The level of residual contamination considered to be acceptable and the provisions for maintaining records of survey should also be included. Equipment used to analyze samples shall be capable of detecting a minimum of 2,000 disintegration per minute (DPM). Laboratory areas where only small

quantities (less than 200 microcuries) of radioactive material are used, may be surveyed weekly and results recorded weekly; however, as a good health physics practice, it is recommended that the laboratory be surveyed daily with use. Indicate who will be doing the survey, the radiation protection officer or the use.

Item 6b Radiation Area Surveys:

Describe the areas that will be surveyed, the frequency of the surveys, and the survey instrument that will be used. Radiation area surveys should be performed at least daily with use and recorded daily. Also describe the provisions for maintaining records of these surveys.

Item 6c Environmental Surveys:

Environmental surveys do not apply.

Item 7 Leak Tests:

Leak tests will be required at six (6) month or three (3) year intervals, depending on the manufacturer and model of the sealed source. Check with manufacturer if in doubt. Please state how this service will be performed. For example, it may be performed by the manufacturer, a consultant or by the applicant using an approved leak test kit. If the applicant proposes to evaluate results of leak tests, a complete description of method (including instrumentation, material, procedures, sample calculations, and the training and experience of the individual evaluating the wipes) must be included.

Item 8 Waste Disposal:

Indicate whether or not an individual user will be allowed to dispose of radioactive materials. What criteria is established for disposal by the sewer system and collection for shipment? Describe the provisions for maintaining disposal records.

The licensee may dispose of waste by:

a. Storage until decay to background for a minimum of 10 half-lives (all solid waste potentially contaminated with radioactive material must be monitored with a suitable instrument to ensure that no detectable radioactivity remains before disposal by normal methods.

b. transfer to a person specifically licensed to receive such wastes, e.g., commercial waste disposal firms;

c. release into a sanitary sewer in conformance with LAC 33:XV.462 (describe the method for controlling the sewerage disposal of radioactive waste in order to ensure that disposal does not exceed the limit specified in LAC 33:XV.462).

d. disposal by incineration in conformance with LAC 33:XV.463; and/or

e. disposal of trace amounts in conformance with LAC 33:XV.464.

Item 9a Health Physics Program:

Written radiation safety procedures to be followed by users should be provided as part of the application and should include the following items:

a. Procedures for ordering radioactive materials, for receipt of materials during off-duty hours, and for notification of responsible persons upon receipt of radioactive materials. These procedures should be adequate to ensure that possession limits are not exceeded, that radioactive materials are secured against unauthorized removal at all times, and that radiation levels in unrestricted areas do not exceed the limits specified in LAC 33:XV.421. It is preferable that all radioactive materials be received in one location so that they may be reliably accounted for and surveyed expeditiously.

b. Procedures for examining incoming packages for leakage, contamination, or damage and for safety opening packages in accordance with LAC 33:XV.455. The monitoring should be performed as soon as practicable after receipt of the package of radioactive material. The procedures may vary depending upon the quantity of radioactive material received, but should, at a minimum, include instructions for surveying packages, wearing gloves while opening packages, and checking packing material for contamination. All packages should be monitored before they are opened.

c. A description of training required for laboratory personnel or students who are involved in or associated with the use of radioactive materials. The description should include the form of training (e.g., formal course work, lectures), the duration of training, the subject matter included, and the means of determining the proficiency of each person handling radioactive materials. The training program

should be of sufficient scope to ensure that all personnel using radioactive materials receive proper instruction, and are knowledgeable in radiation safety procedures and techniques pertinent to their respective duties.

d. A copy of general instructions to be followed by laboratory personnel or students while working with radioactive materials. These instructions should:

(1) Outline control procedures for obtaining permission to use radioactive materials at the institution; give limitations on quantity to be handled per student or allowed per experiment.

(2) Explain what laboratory apparel to wear and what safety equipment to use (e.g., use of laboratory coats, gloves, and remote pipetting devices).

(3) Describe limitations and conditions on handling liquid or loose (unencapsulated or dispersible) radioactive materials and what laboratory equipment to use in working with them. For example, explain when materials and operations should be confined to radiochemical fume hoods or gloveboxes and explain what shielding or remote handling equipment is to be used when hard beta- or gamma-emitting materials are handled.

(4) Instruct the user about routine survey and monitoring procedures for each contamination control zone.

(5) Instruct the user about movement of materials between rooms, halls, or in corridors, if applicable.

(6) Explain requirements for storage of materials and labeling of containers and how areas will be identified where radioactive materials are used. Explain where the how contaminated articles and glassware are to be handled and stored.

(7) Specify personnel monitoring devices to be used, where to obtain them, and instructions given on recording exposure results or properly turning in personnel monitoring devices for processing at appropriate intervals.

(8) Instruct the user in waste disposal procedures to follow in the

laboratory, including limitations for disposal of liquid or solid wastes by the user and procedures to use for waste storage within each laboratory.

(9) Explain what records are to be kept for the use and disposal of materials.

(10) Describe sealed-source leak test procedures.

(11) Describe contamination control procedures, including restrictions against smoking and consumption of food and beverages.

e. A copy of emergency instructions to be posted in all laboratory areas where radioactive materials are used. These instructions should (1) describe immediate action to be taken in order to prevent contamination of personnel and work areas, e.g., turning off the ventilation, evacuation of the areas, containment of the spill, (2) state the telephone numbers of the responsible persons to be notified in case of an emergency, and (3) instruct personnel on appropriate methods for reentering, decontaminating, and recovering facilities that may have been accidentally contaminated.

f. Procedures to be followed if radioisotopes will be used in animals, including (1) a description of the animal housing facilities, (2) a copy of instructions provided to animal caretakers for holding animals, animal wastes, and carcasses, (3) instructions for cleaning and decontaminating animal cages, and (4) procedures for ensuring that animal rooms will be locked or otherwise secured unless attended by authorized users of radioactive material.

Item 9b Physical Facilities:

Describe the facilities and equipment (e.g., remote handling equipment, storage containers, shielding, fume hoods) to be made available at each location where radioactive material will be used. Include a description of the area(s) assigned for the receipt, storage, preparation and measurement of radioactive materials. A diagram should be submitted showing the locations of shielding, the proximity of radiation sources to unrestricted areas, and other items related to radiation safety.

Item 10 Health Physics Instrumentation:

Specify for each radiation detection instrument and manufacturer's name and model number, the number of each type of instrument available, the type of radiation detected (alpha, beta, or gamma), the sensitivity range (milliroentgens per hour or counts per minute), the window thickness in mg/cm^2 and the type of use. The type of use would normally be monitoring, surveying, assaying, or measuring.

Describe the instrument calibration procedure. State the frequency, and describe the methods of procedures for the calibration of survey and monitoring instruments, as well as any other instruments and systems used in the radiation protection program, such as measuring instruments used to assay sealed source leak-test samples, contamination samples, and bioassay samples.

An adequate calibration of survey instruments usually cannot be performed with built-in check sources. Electronic calibrations that do not involve a source of radiation are also no adequate to determine the proper functioning and response of all components of an instrument.

Daily or other frequent checks of survey instruments should be supplemented every 6 months with a two-point calibration on each scale of each instrument with the two points separated by at least 50% of the scale. Survey instruments should also be calibrated following repair. A survey instrument may be considered properly calibrated when the instrument readings are within ±10 percent of the calculated or known values for each point checked. Readings within ±20 percent are considered acceptable if a calibration chart or graph is prepared and attached to the instrument.

If the applicant proposes to calibrate his instruments, a detailed description of planned calibration procedures should be submitted. The description of calibration procedures should include, as a minimum:

a. The manufacturer and model number of the source(s) to be used.

b. The nuclide and quantity of radioactive material contained in the source.

c. The accuracy of the source(s) and the traceability of the source to a primary standard.

d. The step-by-step procedures including associated radiation safety procedures, and

e. The name(s) and pertinent experience of person(s) who will perform the calibrations.

If the applicant intends to contract out the calibration of instruments, the name, address, and license number of the firm should be specified together with the frequency of calibration. The applicant should contact the firm that will perform the calibrations to determine if information concerning calibration procedures has been filed with the Department. If this information concerning calibration procedures has not been filed, it should be obtained and submitted.

Instruments that will be used for quantitative measurements to determine compliance with Radiation Protection regulations (e.g., leak test measurements, effluent monitoring) should be calibrated at 6-month intervals. A description of the procedure for calibration of such instruments should be submitted and should include:

a. The manufacturer and model number of the source(s),

b. The nuclide and quantity of radioactive material in the source(s),

c. The accuracy of the source(s) and the traceability of the source to a primary standard,

d. The step-by-step procedures for calibration, including associated radiation procedures, and

e. The name(s) and pertinent experience of person(d) who will perform the calibrations.

Item 11 General Instrumentation:

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

Item 12 Medical Supplements:

Not applicable.

Item 13 Industrial Radiography Supplements:

Not applicable.

Item 14 If a representative of another company assisted the applicant in completing the application, the name and company affiliation should be listed.

DATE AND SIGNATURE: THE APPLICATION MUST BE SIGNED BY A PERSON AUTHORIZED TO SIGN ON BEHALF OF THE ACADEMIC INSTITUTION. THIS WILL USUALLY BE AN EXECUTIVE OFFICER OF THE INSTITUTION, THE DEAN OF THE PARTICULAR SCHOOL, AND THE BUSINESS MANAGER, OR SOME OTHER DESIGNATED OFFICIAL.

FORM DRC-13

SCHEDULE OF RADIOACTIVE MATERIALS

List each radionuclide to be used, the chemical and physical form and maximum quantity (in millicuries) of each radionuclide to possessed at any one time. State separate possession limits for each chemical and physical form requested, e.g., I-131 as Iodide and as Labeled Proteins. List the manufacturer, model number and quantity for all sealed sources. Describe the intended use for each radionuclide listed. Any use of radioactive material in animals should be indicated.

RADIOLOGICAL QUALIFICATIONS AND TRAINING

Complete the requested information for all individuals under Item 4, "Radiation Program Personnel," Form DRC-ll. This information may be submitted on a separate attachment if desired, but the attachment should be referenced. Describe the training and experience of the personnel, including his experience in using radiation and radioactive materials.

ADDENDUM TO PERMIT APPLICATIONS:

The “ADDENDUM TO PERMIT APPLICATIONS PER LAC 33:I.1701. This form must be completed before a license can be issued. This form can be found at http://www.deq.louisiana.gov/portal/tabid/240/Default.aspx

IT Questions

Part of the application for a radioactive material license must include response to the "IT Questions. " The "IT Questions" were formulated by the Supreme Court in the Save Ourselves vs. Louisiana Environmental Control Commission, 452 So. 2d 1152 (La. 1984). The responses are intended to assure the Department that the activity and the site are suitable. If not applicable, please indicate N/A. The five questions are:

A. Have the potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible?

B. Does a cost-benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former?

C. Are there alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits?

D. Are there alternative sites which would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits?

E. Are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits?

SAMPLE ALARA PROGRAM

The following conditions describe the program followed by _____ to ensure that occupational radiation exposures to employees engaged in the use of radioactive equipment are kept as low as reasonably achievable.

1. Management Commitment

_____ is committed to make every reasonable effort to minimize Radiation exposures to employees, through the following control measures:

a. Personnel will be made aware of management's commitment to maintain low exposure levels.

b. Management will periodically review operating procedures with radiation safety officer to determine steps taken to reduce exposures.

c. Management will ensure that the person, or persons, selected for Radiation Safety Officer responsibilities are fully qualified to administer all aspects of a radiation protection program.

d. Management will ensure that all employees engaged in the use of radioactive equipment are fully trained in the area of radiation safety. This will be reviewed at least once per year, and additional training will be scheduled as necessary.

e. The RSO has full authority to enforce safe operation, and to communicate as required with appropriate levels of management to halt an operation he deems unsafe.

2. VIGILANCE BY THE RSO AND RADIATION PROTECTION STAFF

The RSO has the responsibility to monitor the Radiation Safety Program to ensure that exposures are as low as reasonably achievable, and to search for new and better ways to perform jobs with less exposure. The following aspects apply to this responsibility:

a. The RSO shall know the origins of radiation exposure and be aware of trends in exposures.

b. Should unusual exposures occur, the RSO shall initiate an investigation of the circumstances to determine causes and prevent the likelihood of recurrence. Operating procedures should periodically be reviewed to identify situations in which exposures can be reduced.

c. The RSO shall be responsible for ensuring that the equipment used is maintained in good working order and used properly. Written procedures for use of the equipment are to be available and followed.

Signed: _____ Title: _____ Date:_____
(Management)