



INSTRUCTIONS FOR PREPARATION OF APPLICATION FOR RADIOACTIVE MATERIAL LICENSE FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

An applicant for a new Radioactive Material License or for renewal of an existing Colorado Radioactive Material License must complete Form OR-RH-12.30 in detail. The applicant must cover the entire radioisotope program with one application. Supplemental sheets may be appended when necessary to provide complete information.

A licensee who desires to amend their existing Radioactive Material License need not submit Form OR-RH-12.30. Amendment requests are made by submitting a letter to the Radiation Management Unit detailing the requested changes to the license and providing supporting information. There are no fees required to process an amendment for an existing license.

An application fee as specified in Part 12 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control* must accompany each application for new license. Except for licenses subject to full cost, no application for a new license, or for the reinstatement of an expired license will be accepted for processing prior to payment of the full amount specified in Part 12 of the Regulations. If you have any questions concerning fees please call the Department at (303) 692-3220 prior to submitting your application.

The original copy of the completed Form OR-RH-12.30 with signature and attachments must be emailed to CDPHE_hmradmat@state.co.us. Mail the fee payment (and the form and attachments, if electronic copies cannot be submitted) to the Colorado Department of Public Health and Environment, Radiation Management Program, HMWMD-B2, 4300 Cherry Creek Drive South, Denver, CO 80246-1530. The applicant must retain one copy.

The submission of an incomplete application will often delay the issuance of the license because of the correspondence necessary to obtain information requested on the application. Pursuant to Part 12.4.1.5 of the Regulations, the Department will consider any application abandoned if the Department does not receive a reply within forty-five (45) days to its most recent request for additional information.

- Item 1.** Indicate whether the application is for a new license or the renewal of an existing license. For renewals provide the license number and expiration date for your current license.
- Item 2.** The "Applicant" is the organization or person legally responsible for possession and use of the radioactive material specified in the application. This will usually be the corporate name of the company.
- Item 3.** Indicate the applicant's tax identification number. All applicants must be registered as a business in the State of Colorado and in good standing to receive a radioactive materials license. The Secretary of State's website can be found at: <http://www.sos.state.co.us/>

- Item 4.** Indicate the applicant's mailing address. A post office box address is acceptable as a mailing address. Indicate the physical address from where licensed activities will be conducted at a permanent radiographic installation(s) or at a field station(s). This address would include the location where radioactive materials will be received, possessed, processed, stored or used. If this address is the same as the applicant's mailing address you may simply indicate "SAME" in the space provided. However, a post office box number is NOT acceptable as a facility address in Item 4. If the applicant desires authorization for multiple locations, then attach separate sheets listing the physical address for each location. Indicate the location where all records will be stored or maintained. Indicate whether radiography operations will be performed at temporary job sites.
- Item 5.** Provide the name, title, daytime telephone number, fax number, and e-mail address for the management contact at the applicant's facility who should be contacted if there are questions regarding the application. Provide the name, daytime telephone number, fax number, and e-mail address of the person designated as the Radiation Safety Officer. These two individuals may be the same person. If the application is for multiple facility locations, identify the name of the individual to be designated as the on-site RSO for each location.

The individual designated as the RSO has the responsibility for assuring the implementation of the radiation safety program. This individual also provides assistance to other radiation workers when needed to assure radiation safety. For these reasons, the RSO is typically an individual who has more extensive training and experience than other authorized users to be listed on the license.

The documentation of training and experience provided for each RSO must clearly demonstrate that the individual has successfully met the requirements of Appendix 5B of the Regulations.

Attach a description of the Radiation Safety Officer's duties and authorities. They should include:

- A. Establishing and overseeing all operating, emergency, and ALARA procedures, and reviewing them regularly to ensure they conform to Department regulations and to the license or registration conditions.
- B. Overseeing and approving the training program for radiographic personnel to ensure that appropriate and effective radiation protection practices are taught.
- C. Ensuring that required radiations surveys and leak tests are performed and documented in accordance with the regulations, including any corrective measures when levels of radiation exceed established limits.
- D. Ensuring that personnel monitoring devices are calibrated, if applicable, and used properly; that records are kept of the monitoring results; and that timely notifications are made as required by Part 4 of these regulations.
- E. Ensuring that operations are conducted safely and for implementing corrective actions including terminating operations.

It is not necessary to provide documentation of training and experience for anyone not specifically listed on the license, e.g. radiographers or radiographer's assistants.

- Item 6.** Provide the name, title, daytime telephone number, fax number, and e-mail address for the billing contact at the applicant's facility who should be contacted if there are questions regarding billing.
- Item 7.** List by element and mass number each radioisotope desired, such as "Iridium-192", "Cobalt-60", etc. Specify the physical form as "sealed source," include the manufacturer and model number for that sealed source, and state the number of sources the applicant desires to possess at any one time. Attach additional pages if necessary.

For example:

One (1) Cobalt-60 J.L. Shepherd model 7810 sealed source, 18.5 GBq (550 millicuries) to be used in a J.L. Shepherd model 28 calibrator for the calibration of survey instruments.

Ten (10) Iridium-192 QSA Model 87703, INC Model 7, or AEA Model A424-9 sealed sources, 3.7 TBq (100 Ci) each for use in AEA Model 880 Delta for industrial radiography. Source changer to be used is INC Model IR-50 or AEA Model 650L.

Table format is acceptable:

Ten (10) sources	Iridium-192	3.7 TBq (100 Ci) in a sealed source QSA Model 87703, INC Model 7, or AEA Model A424-9	To be used in industrial radiography.	Source changer INC Model IR-50 or AEA Model 650L.
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- Item 8.** Identify the radiation detection instruments and probes that will be used in conjunction with your radioactive materials program. The instrument and probe must be capable of detecting the emissions from the specific radioactive materials for which the survey is being conducted. Also, the sensitivity and efficiency of the instrument must be appropriate for the type of use. Instruments for industrial radiography must be capable of measuring a range from 0.02 millisievert (2 mrem) per hour through 0.01 sievert (1 rem) per hour. Describe how the instruments will be used (area surveys, contamination surveys, wipe counting, etc).
- Item 9.** Submit a copy of your calibration procedures.
- A. Each radiation survey instrument shall be calibrated at energies appropriate for use and at intervals not to exceed 6 months.
 - B. The calibration of a survey instrument must be made with an appropriate radioactive source, which is traceable to the National Institute for Standards and Technology (NIST). Specify the manufacturer, model number, radionuclide, maximum activity of each source and the total number of sources of each type. If a specific source is to be used within a device or as part of a piece of equipment, also provide the manufacturer and model number of the device or equipment.
 - C. The individual performing the calibration must have at least 40 hours of formal course work and 1 week of on-the-job training. The training must include hands-on experience in calibrating instruments.
 - D. The instrument must be calibrated so that an accuracy within plus or minus 20% of the true radiation dose rate can be demonstrated at each point checked.
 - E. If a commercial service is to be used, the company must be licensed to provide that service. Submit the company's name, address, and license number.
- Item 10.** The supplier of film badges, thermoluminescent dosimeters (TLD) or optically stimulated luminescence dosimeters (OSL) must be approved by the National Voluntary Laboratory Accreditation Program (NVLAP). The frequency of exchange for film badges must not exceed 1 month, and should comply with the manufacturer's specifications for TLD's and OLS's. Specify the manufacturer and model of the alarming rate meter and pocket dosimeter used. Specify the frequency and procedures for the calibration of these dosimeters.

Item 11. Facilities and Handling Equipment:

- A. Specify the types of equipment that will be used in conjunction with radioactive materials. Examples would include remote handling devices, lead shields, storage containers, shipping containers, and other safety equipment.
- B. The sketch of your facility must be sufficiently detailed to give a clear picture of your facility in relation to radioactive material usage.
Clearly identify the locations or areas where:
 - o Radioactive materials are used and stored.
 - o Special equipment and shielding are used.
 - o Area surveys and wipes will be conducted.
 - o Radioactive materials warning signs and notices are posted.
 - o Non-radiation workers or the general public will have access.Your diagram should include descriptions and locations of adjacent (including above or below) businesses, office suites, parking lots, sidewalks, etc.
- C. Attach calculations and/or survey results to demonstrate compliance with dose limits for members of the public at all storage and use locations (see Part 4.14 and 4.15 of the Regulations). Provide written procedures for complying with public dose limits while performing source exchanges.

Item 12. The description of your radiation protection program must cover the entire scope of your radioactive materials usage. These procedures should describe in detail how the applicant will perform activities. Attach written operating procedures for each activity that is appropriate.

- A. Demonstrate that the RSO has sufficient independence and direct communication with responsible management officials by providing a copy of an organizational chart by position, demonstrating day-to-day oversight of the radiation safety activities.
- B. The training and experience for radiographers and radiographer's assistants should include, in addition to the requirements of Appendix 5C and 5D:
 - 1) An inspection of the job performance of each radiographer and radiographer's assistant at intervals not to exceed 6 months, to ensure that the Department's regulations, license or registration requirements, and operating and emergency procedures are followed.
 - 2) A provision to maintain records of the training to include certification documents, written, oral and practical examinations, refresher safety training, and inspections of job performance.
- C. Licensed materials must be tracked from "cradle to grave" in order to ensure accountability; identify when sources/devices may be lost, stolen, or misplaced; and ensure that the possession limit stated on the license is not exceeded.

Identify the procedures for maintaining records of receipt, transfer, and disposal of sources/devices. Identify the procedures for conducting physical inventories at quarterly intervals (not to exceed 3 months) to account for all sealed sources containing byproduct material and devices containing depleted uranium.

- D. Describe the procedures for leak testing sealed sources or exposure devices containing depleted uranium (DU) shielding. If the applicant intends to perform leak testing in-house, describe the procedures for performing the test. The description must include 1) methods of collecting the samples, 2) qualifications of the individual who analyzes the samples, 3) instruments to be used, and 4) methods of analyzing the samples.

- E. Provide the written procedures for quarterly inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments as required by Section 5.12 of the Regulations.

These procedures are intended to allow the licensee's staff to evaluate equipment used in radiography for safe continued use, to provide a record of this evaluation, and to guide the staff in maintenance. Equipment found to be unsuitable for service must be withdrawn until repair and an evaluation for return to service is made. These procedures may be based on the manufacturer's recommendations. The procedures are to be specific to the equipment.

The licensee's inspection and maintenance program must include procedures to assure that each Type B package is shipped and maintained in accordance with the certificate of compliance or other approval.

- F. The purpose of operating and emergency procedures is to provide radiography personnel with specific guidance for all operations they will perform. These topics should be included in the operating and emergency procedures and need not be presented in order of importance. A sequential set of procedures and instructions from the beginning to the end of the workday is an acceptable format. Instructions for non-routine operations, for example, quarterly inspection and maintenance or instrument calibration, may be included as separate appendices.

It is not necessary for operating and emergency procedures to be specific to a particular make and model of exposure device, source exchanger, or survey instrument. Procedures submitted to the Department should provide sufficient guidance and instruction for each specific type of device. For example, you may submit a single operating procedure for crank-out regardless of the manufacturer and/or a single operating procedure for pipeliner exposure devices regardless of manufacturer.

In regards to item F.12, applicants must develop source retrieval procedures if their own radiographic personnel with appropriate training and experience will conduct source retrievals. If procedures are submitted, the Department will review and approve applicants to perform source retrieval. If source retrieval procedures are not submitted for review, then identify the specific company or agency that will be performing the source retrieval should it be needed. Source retrieval activities must be conducted by an NRC or Agreement State licensee whose license specifically authorizes these activities.

The Department will review the applicant's procedures for source retrieval with respect to keeping exposures ALARA and controlling exposures to radiation. Since it is not possible to specify all potential exposure situations, a general procedure is acceptable. A retrieval procedure should contain the following elements:

- Warnings that only specifically authorized individuals, or personnel supervised by such authorized individuals and working in their presence, are allowed to perform retrievals.
- A clear statement that no source or suspected source containing items such as a stuck source in a guide tube will be handled directly.
- Expedient methods of reducing unintended exposure to staff and the public, such as using lead shot bags, sandbags, steel plates, remote handling devices, and culverts cut lengthwise.
- Additional dosimetry should be used during source retrievals, for example, pocket dosimeters with a range greater than 2 mSv (200 mrems) or finger badges.
- Methods of restricting access to the area, including establishing a restricted area and obtaining outside help in controlling access.
- Appropriate use of survey instruments. The procedure should prohibit using alarming dosimeters or electronic dosimeters as survey instrument substitutes.
- Criteria for requesting outside assistance.
- Instructions for reducing the exposure to other personnel and members of the public during recovery operations.
- Notification of the RSO, RSO-designee, and management.
- Specific training including practice with special tools, shielding, and additional dosimetry with a dummy source.
- Notification of the NRC or Agreement State.

Item 13. Licensees who dispose of radiography sealed sources containing byproduct material, or dispose of radiography devices containing depleted uranium, must transfer them to an authorized recipient. Recipients authorized to accept radioactive waste from other persons, or another specific licensee authorized to possess the licensed material, i.e., whose license specifically authorizes the radionuclide and its use are the original manufacturer of the device, or a commercial firm licensed by the NRC or an Agreement State.

Before transferring radioactive material, a licensee must use one of the methods described in Part 3.22 of the Regulations to verify that the recipient is properly authorized to receive it. In addition, all packages containing radioactive sources must be prepared and shipped in accordance with State and DOT regulations. Records of the transfer must be maintained as required by section 5.25 of the Regulations.

Item 14. Demonstrate that the requirements of Part 3.9.5 of the Regulations have been satisfied. The requirements for financial assurance are based on the isotope, physical form, and activity of licensed materials. Financial assurance is required for licensees possessing radioactive material with a half-life greater than 120 days, e.g. Cobalt-60 and dependent upon form and quantity.

- Item 15.** The quantities of radionuclides of concern requiring enhanced security and protective measures are listed in NRC Order EA-05-090, and can be found at http://www.nrc.gov/reading-rm/doc-collections/enforcement/security/2005/ea05090_ml053130183.pdf

Documentation should include: Trustworthy & Reliable Official Certification documentation, a statement indicating compliance status with the Increased Controls fingerprint and background check requirements and a description of the Increased Controls program and controls. The licensee shall have a documented program to immediately detect unauthorized access to material when it occurs, assess whether the unauthorized access was an actual or attempted theft, and if so, initiate appropriate response. The program's documentation shall describe the processes as to how the licensee would assess and respond to unauthorized access, i.e. information describing how the radioactive material is secured from unauthorized removal or access when it is in storage, information describing how the licensee controls and maintains constant surveillance of the radioactive material when not in storage, information describing specific policies and procedures for actions taken by the licensee in response to the increased controls, and the details of the enhancements implemented for the radioactive material covered under this requirement.

Additional information can be found at:

<http://www.cdphe.state.co.us/hm/rad/rml/rmlimplementguide.pdf>

- Item 16.** Any radiation machine, defined as any device capable of producing radiation except those devices with radioactive material as the only source of radiation (that is in service) must be registered with the State per Part 2.4 of the Regulations.

Commitments C.1 through C.4 reflect requirements from the State of Colorado *Rules and Regulations Pertaining to Radiation Control* which apply to use of radioactive materials for industrial radiographic operations. All applicable requirements of the Regulations have not been specifically addressed or incorporated into the application. The applicant must be thoroughly familiar with the requirements of the Regulations, the license, and the applicant's procedures established to fulfill regulatory requirements. Many of the commitments require that written procedures and/or other documents be maintained by the licensee. Department inspectors will review required records, written procedures, and documentation of worker training and experience during site inspections.

CERTIFICATE:

The individuals signing the application must have the authority to make commitments on behalf of the applicant. A signature indicates that the application and attachments contain true and correct information and that the applicant will abide by the commitments identified in the application and the State of Colorado *Rules and Regulations Pertaining to Radiation Control*.

The application is to be signed by both a management representative and the designated Radiation Safety Officer. The designated Radiation Safety Officer (RSO), must agree in writing to be responsible for implementing the radiation safety program. The licensee, through the RSO, shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements.

If you have specific questions, Ms. Cheri Hall, Licensing Lead, may be reached by phone at 303-692-3444, by fax at 303-691-7841, or by email at cheri.hall@state.co.us.

The Department's licensing staff are also available to answer questions and can meet with you prior to the submission of a license application to discuss any specific issues you may have regarding the licensing process, regulatory requirements, and the information to be provided with the application.