

A GUIDE FOR THE PREPARATION OF
RADIOACTIVE MATERIAL LICENSE
APPLICATIONS FOR THE USE OF SEALED
SOURCES IN PORTABLE GAUGING DEVICES



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I. INTRODUCTION

A. Purpose of Guide

This portable gauge license guide describes the information needed to evaluate an application for a specific license for receipt, possession, use and transfer of radioactive material in the form of sealed sources as contained in portable nuclear gauging devices. This guide also provides assistance to applicants and licensees in preparing applications for license amendments, license renewals, amendments in entireties and license transfers.

There is no single portion of the Kentucky Radioactive Material Regulations, 902 KAR 100 (<http://www.lrc.ky.gov/kar/TITLE902.HTM>) which specifically addresses portable gauging devices. Therefore, this guide is intended to provide you with information that will clarify more general regulatory requirements and licensing policies as they apply to portable gauging devices. Licensing guides are issued to describe the methods acceptable to the Radiation Health Branch for implementing the Cabinet's regulations, to outline techniques used by the staff in evaluating specific problems, and to provide guidance to applicants. The information in this guide is not a substitute for training in radiation safety or for developing and implementing an effective radiation safety program. However, you should be aware that if your application references procedures in this guide, those procedures become a part of your licensing conditions and regulatory requirements.

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application and other correspondence with the Radiation Health Branch, (2) the terms and conditions of the license, and (3) applicable regulations as discussed below. Therefore, all information you provide in your application must be clear, specific and accurate.

B. Applicable Regulations

In addition to the contents of this guide, applicants should refer to the requirements in the Cabinet's regulations listed below. The applicant should carefully read the regulations. This guide does not substitute for an understanding of the regulations. It is your responsibility as an applicant and licensee to have copies, read and abide by each regulation.

1. 902 KAR 100:012, "Fees." (<http://www.lrc.ky.gov/kar/902/100/012.htm>)
2. 902 KAR 100:019, "Standards for Protection Against Radiation." (<http://www.lrc.ky.gov/kar/902/100/019.htm>)
3. 902 KAR 100:040, "General Provisions for Specific Licensees." (<http://www.lrc.ky.gov/kar/902/100/040.htm>)
4. 902 KAR 100:060, "Leak Testing." (<http://www.lrc.ky.gov/kar/902/100/060.htm>)
5. 902 KAR 100:070, "Transportation of Radioactive Material." (<http://www.lrc.ky.gov/kar/902/100/070.htm>)
6. 902 KAR 100:165, "Notices, Reports and Instructions to Employees." (<http://www.lrc.ky.gov/kar/902/100/165.htm>)

C. As Low As Reasonably Achievable (ALARA) Philosophy

Section 2 of 902 KAR 100:019 states that each licensee shall develop, document and implement a radiation protection program commensurate with the scope and extent of their activities and sufficient to ensure compliance with the provisions of 902 KAR 100:019. This must include the use, to the extent practicable, of procedures and engineering

controls based on sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. This radiation protection program must be reviewed at least annually for the effectiveness of its implementation (see attached Appendix E – Sample Audit). Section 30 of 902 KAR 100:019 requires licensees to maintain records of the provisions of their radiation protection program until the license is terminated by the Cabinet. Records of audits and other reviews of program content and implementation must be retained for three (3) years after the record is made.

II. FEES

A fee is required for a radioactive material license, renewals and amendments. The applicant should refer to 902 KAR 100:012, "Fees", to determine the amount of fee that must accompany the application (<http://www.lrc.ky.gov/kar/902/100/012.htm>). Checks should be made payable to the Kentucky State Treasurer. Checks should be mailed to the Kentucky Radiation Health Branch, 275 East Main Street, Mailstop HS1C-A, Frankfort, KY 40621. The annual licensing fee for portable gauge users is **\$390.00**. No action will be taken on applications submitted without the proper fee. Annual license renewal fees for which the Radiation Health Branch issues an Invoice Number, may be paid on-line 24/7/365 at the following "Rad ePay" web address https://apps4.chfs.ky.gov/Rad_ePay/

III. FILING AN APPLICATION

An application for a license should be filed on Form RPS-7, "Application for Radioactive Material License." Since the space provided on the form is limited, additional sheets should be attached as necessary to provide complete information. Each separate sheet submitted with the application should be identified and keyed to the item number on the application to which it refers. The information submitted must be of sufficient detail to enable the Cabinet to determine that the proposed equipment, facilities, procedures and controls are adequate to protect health and minimize danger to life and property. Submittal of insufficient information will result in delays in issuance of the license. **The applicant is strongly encouraged to use the Portable Gauge License Application Checklist located on page 44 to assist with filling out the license application.**

The original application should be mailed to:

Radiation Health Branch
Department for Public Health
275 East Main Street
Mailstop HS1C-A
Frankfort, Kentucky 40621

One copy of the application with all information submitted should be retained by the applicant for as long as the license is active. Licensees are required to possess and use licensed material in accordance with the statements and representations in the application, license conditions and Cabinet rules and regulations.

IV. CONTENTS OF AN APPLICATION

Item 1 - Applicant and Mailing Address: The applicant corporation or other legal entity should be specified by name and mailing address in Item 1. Individuals should be

designated as the applicant only if they are acting in a private capacity and the use of radioactive material is not connected with their employment with a corporation or other legal entity. All legal entities conducting business in the Commonwealth of Kentucky are required by law to be registered with the Kentucky Secretary of State (see <http://www.sos.ky.gov/business/filings/>). The Cabinet will verify registration with the Secretary of State's office prior to granting a radioactive materials license.

The applicant must also specify a single, physical address in Kentucky where all records required by Kentucky Administrative Regulations 902 KAR 100 and conditions of the license, once granted, are to be maintained and made available for review by the Cabinet during normal working hours. The Cabinet shall issue a license only to an applicant who maintains an office in Kentucky at which copies of records are kept and from which licensed activities are directed. However, the applicant may maintain an out-of-state office for corporate radiation safety direction. Official correspondence from the Cabinet may be mailed to the out-of-state address if requested by the applicant.

Item 2 - Street Address(es) Where Radioactive Material Will Be Used or Stored: Specify each location of storage or use by the street address and city or other descriptive address (such as 5 miles east on Highway 10, Town, State) to allow easy locating of the facility. These sites may be different from the mailing address specified in Item 1. A post office box address or personal mail box address is not acceptable. If you will conduct operations at temporary job sites, you may also specify "temporary job sites throughout the Commonwealth of Kentucky."

Long-term storage of gauges in vehicles or personal residences not listed on the license as an approved storage area is not permitted. If the applicant wishes to temporarily store gauges in locations other than those actually stated in Item 2 above for dispatch to customer job sites such as a personal residence of an authorized users, the applicant should include a description of those locations as well.

Item 3 - Telephone Number: Indicate the telephone number of the applicant. Someone knowledgeable of the facility's radiation safety program should be available at this number or else, be able to transfer the Cabinet to someone who is. Only one telephone number is permitted to be listed on the license.

Item 4 - Person to be Contacted: This individual should know your proposed program and be able to answer questions regarding the application. A change in the contact person requires notification to the Cabinet but is not considered an application for amendment; therefore a \$75 amendment fee is not required. Such changes in contact name and telephone number are processed as technical amendments at no charge to the facility.

Item 5 - Individual(s) and Title(s) Who Will Use Radioactive Material: Each person who will use radioactive material should be named in Item 5 and his or her qualifications provided in Item 13. An authorized user, as specified in the license, must be physically present when the gauges are in use. Copies of manufacture's gauge user radiation safety training certificates or equivalent and proof of current U.S. Dept. of Transportation 49 CR 172 subpart H hazmat training are required.

Item 6 - Radiation Safety Officer (RSO): This individual is responsible for your radiation safety program, and as a minimum, should have completed a manufacturer's RSO course

or have received equivalent training. The RSO is expected to coordinate the safe use of the gauging devices and ensure compliance with the Kentucky Administrative Regulations 902 KAR 100 and applicable U.S. Department of Transportation regulations. The RSO should be someone who is capable of supervising the day-to-day operations of the facility as it relates to radiation safety and the possession and use of radioactive materials.

The RSO needs independent authority to stop operations that he or she considers unsafe. The RSO also needs sufficient time and commitment from management to fulfill certain duties and responsibilities to ensure that radioactive materials are used by authorized individuals and in a safe manner. Provide management's written commitment that the RSO has independent authority to stop unsafe operations and will be given sufficient time to fulfill his/her radiation safety duties and responsibilities (see Sample Delegation of Authority to the RSO).

Provide a description of the methods and checks management will use to assure that the RSO has current copies of the regulations, reviews all new and revised regulations, and makes changes, as needed, in licensee procedures to comply with the regulations.

Describe the duties and responsibilities of the RSO. The duties and responsibilities should be spelled out in writing and agreed to by both the RSO and senior management (see Appendix A – Duties and Responsibilities of the Radiation Safety Officer as an example). Typical duties should, at minimum, include those areas listed in Appendix A.

Provide a copy of an organizational chart that shows the RSO position to demonstrate that the RSO has sufficient independence and direct communication with responsible management officials (see attached Model Organizational Chart).

Item 7 - Licensed Material and Use of Radioactive Material:

- (a) Identify each radioisotope that will be used in the gauge (for example, Cesium-137, Americium-241, etc.).
- (b) Chemical and/or physical form. For most, but not all portable gauging devices, this will be “sealed source”. Ra-226/Be sources are one such exception as are Ni-63 foil sources found in hand-held XRF devices.
- (c) Identify the manufacturer and model number of each sealed source. If the manufacturer does not provide this information, please contact the Radiation Health Branch and we will provide you with a copy of the manufacturer’s Sealed Source and Device Registry (SSDR) for the make and model of gauge(s) in question.
- (d) Specify the maximum activity of radioactive material (in millicuries or Becquerel's) that will be in each sealed source. If the device does not contain a sealed source, specify the maximum activity that will be possessed. Normally, the maximum activity permitted by the manufacturer’s SSDR will be used for this value.
- (e) Specify the maximum number of sealed sources of each particular make and model which will be possessed at any given time.
- (f) Identify the manufacturer and model number of the actual gauge in which the sealed source(s) identified in 7.(c) above will be used and for what purposes.

In addition to the above, provide the following written commitments and assurances.

1. Provide a commitment to limit the number of source/device combinations such that

you do not exceed the quantities of radioactive material that would require financial assurance for decommissioning. These limits are defined in 902 KAR 100:040, Section 15 (<http://www.lrc.state.ky.us/kar/902/100/015.htm>). With this commitment, you will still need to specify, in advance, a particular number of identical source/device combinations that you may wish to possess as called for in 7.(e). above. This maximum number of identical sealed source/device combinations you will possess at one time is referred to as the possession limit for each particular make and model of gauge. The applicant may wish to state a possession limit to reflect the actual number of gauges of a particular make and model that will be possessed or the applicant has the option of upping this possession limit to allow for a slightly greater number of gauges of a particular make and model to allow for increased work load or demand in the future. Refer to 902 KAR 100:040, Section 15 for further discussion on financial assurance and for recordkeeping requirements important for decommissioning. For financial assurance to apply for a licensee possession only portable nuclear gauges containing Cs-137 and Am-241, the facility would have to possess well over a hundred a nuclear gauges so the need for financial assurance is highly unlikely.

2. Specify in writing the purpose(s) for which the gauging device(s) you want to possess will be used. For example, a moisture/ density gauge is normally used for measuring moisture and density of construction materials. In order for gauging devices to be used safely, the device should be used only for the purposes for which the device was designed and in accordance with the manufacturer's recommendations for use.
3. Specify in writing, whether or not the sealed source will be lowered into the ground more than the 1-3 feet common for most surface measurements. If you plan to make measurements at depths exceeding 3 feet, you will need appropriate provisions in your operating and emergency procedures to reduce the probability of the source becoming lodged in the hole and to recover a "stuck" source, respectively. Your license will require that you notify the Cabinet in accordance with 902 KAR 100:019 and 902 KAR 100:040, if a sealed source becomes lodged in a hole and it becomes apparent that recovery efforts will be unsuccessful.
4. Commit in writing to all portable gauges having a minimum of two (2) independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, if portable gauges are not under the control and constant surveillance of the licensee in accordance with 902 KAR 100:040, Section 6 (4) (<http://www.lrc.state.ky.us/kar/902/100/040.htm>). This applies to gauges while being transported and while in storage. See the section entitled "New Security Requirements for Portable Gauges" starting on page 385 of this guide.

Item 8 & 9 - Radiation Detection Instruments and Calibrations: If you plan to perform non-routine gauge servicing that requires removal of the source from its "safe" shielded position or removal of the source rod from the gauging device, you will need to address the items listed in Appendix B, which includes the possession and use of radiation detection instrumentation. Cleaning of the shutter sliding block mechanism with the source rod in the "safe" shielded position in accordance with the manufacturer's procedure is considered routine maintenance and does not require the use of a radiation detection instrument. However, the person performing those routine service procedures

must be issued and wear personnel monitoring devices.

Licensees are not required to possess and radiation survey meter unless they desire to perform non-routine service operations that require removal of the source rod from its “safe” shielded position or remove the source rod from the gauge entirely. In those cases, a radiation survey meter is required and must be capable of detecting gamma radiation and must be checked for functionality before use (e.g. with the gauge or a check source) as discussed in Appendix B. If a radiation survey meter is required, the applicant must commit in writing to calibrating that instrument at intervals not to exceed twelve (12) months.

For all other licensees, the applicants should discuss how they will obtain a radiation survey instrument in the event a gauge is accidentally damaged. Each year there are a number of incidents involving portable gauges being damaged at construction sites (e.g., construction equipment running over the gauge). It is important to determine as soon as possible after an incident, by the use of a radiation survey meter, whether the shielding and source are intact. Applicants should preplan how they will obtain a radiation survey instrument (e.g., use an instrument located on-site or obtain one from the applicant’s home office or a local emergency response organization or else immediately notify the Kentucky Radiation Health Branch and ask for assistance).

Item 10 - Personnel Monitoring Devices: Normally, personnel using portable moisture-density gauges are required to wear personnel monitoring devices such as film badges, thermoluminescence dosimeters (TLD) or optically stimulated luminescence dosimeter (OSLD). Personnel monitoring devices are also required to be worn during routine maintenance and servicing on the gauge that is authorized by the license. Specify the type of personnel monitoring device that will be utilized (e.g. film badge, TLD, OSLD), the name and address of the supplier and the frequency of exchange and the name and address of the supplier of the monitoring service. In general, a monthly exchange is required for film badges due to their susceptibility to heat and sun light but TLDs and OSLDs may be exchanged every three (3) months. For a complete listing of all companies approved by the National Institutes of Standards (NIST) National Laboratory Accreditation Program (NVLAP) see <http://ts.nist.gov/standards/scopes/dosim.htm> . Any dosimetry provider listed on the NIST NVLAP directory is perfectly acceptable to use as a dosimetry provider.

Item 11 - Facilities and Equipment: The applicant should provide a description of the means of storage of gauges or devices at the permanent address and at temporary jobsites when gauges are not in actual use by the individuals listed in the application. Kentucky Administrative Regulation 902 KAR 100:019, Sections 21 and 22 require that licensed material stored in an unrestricted area be secured from unauthorized removal from the place of storage and that licensed material in an unrestricted area and not in storage be tended under constant surveillance and immediate control of the licensee. Furthermore, 902 KAR 100:040, Section 6 (4) requires that all portable gauges have a minimum of two (2) independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, if portable gauges are not under the control and constant surveillance of the licensee. This applies to gauges while being transported and while in storage. See the section entitled “New Security Requirements for Portable Gauges” starting on page 38 of this guide.

A simple sketch of the storage area(s) showing relationship to actively occupied areas

should be submitted. At minimum, a distance of fifteen (15) feet should be kept between any gauge and all routinely occupied areas and spaces, including above and below as well as side to side. This 15 foot distance from the gauge will ensure compliance with the dose limits for members of the public as well as the dose limits for unrestricted areas of 2 mrem in any one hour. The dose rate from a single moisture-density gauge at a distance of 15 feet is generally less than 0.05 mrem per hour, thus a person exposed at that distance for 40 hours per week for 50 weeks per year (i.e., 2000 hours) would receive a dose of less than 100 mrem in a year. The above rule only applies to a single gauge. For multiple gauges, the distance at which the public dose limits would be met under the same assumptions is greater. For example, the distance would be 21 feet for two gauges and 26 feet for 3 gauges.

You should state that the device will be stored in a locked enclosure such as store room, closet, etc., in a way that will prevent access by unauthorized persons. Indicate who will have access to the storage areas. Only authorized gauge users or other persons designated in writing by the RSO should have access to areas where gauges are stored. Confirm that the storage location does not include residential quarters. Confirm that the location where gauges are to be stored is approved by code enforcement for the storage of hazard class 7 radioactive materials. If the building is leased, provide a written approval from the landlord or property owner that storage of nuclear gauges is allowed. If the gauge will be kept at a temporary jobsite overnight, a description should be submitted of the means of storage to prevent unauthorized access.

902 KAR 100:165, Section 1 requires the posting of certain documents, notices and forms, in order to be readily observable by employees. These postings are to include the KR-441 Notice to Employees and the Emergency Procedures as well as the regulations referenced in Section 2, and a copy of the license. Alternatively, a notice of where to find the regulations and a copy of the license may be posted alongside KR-441 and the Emergency Procedures. Refer to the regulation for other posting requirements <http://www.lrc.state.ky.us/kar/902/100/165.htm>. The posting requirements do not apply to temporary overnight storage locations. Posting of these documents is typically at or near the gauge storage location or else in a room or area frequented by gauge users such as a break area where other required postings are maintained. But in any case, the postings must be clear and conspicuous.

The entrance to the gauge storage location must be posted with a sign bearing the radiation symbol (trefoil) and the words "Caution - Radioactive Materials" with a yellow background and black or magenta lettering. The sign must be clearly visible to anyone entering the area. If the area has more than one entrance, then a sign should be posted at each entrance. Normally, the caution sign would be posted on the outside of the entrance door, but it is also acceptable to post the sign immediately inside the area such that any person entering the room would see the warning. If the gauge is stored inside a cabinet, a caution sign should be posted on the outside of the cabinet.

Item 12 - Radiation Protection Program: Procedures should be established to ensure compliance with the provisions of 902 KAR 100:019, "Standards for Protection Against Radiation" (see <http://www.lrc.state.ky.us/kar/902/100/019.htm>), and 902 KAR 100:165, "Notices, Reports and Instructions for Employees" (see <http://www.lrc.state.ky.us/kar/902/100/165.htm>) and Form KR-441, Notice to Employees

(see Forms at <http://www.chfs.ky.gov/dph/radioactive.htm>). The applicant should submit a copy of his/her written radiation safety program including operating and emergency procedures in the form of written instructions to users, covering the following items:

1. 12.1 Duties and Responsibilities of Radiation Protection Officer (see Appendix A)
2. 12.2 Transportation of Devices to Field Locations

The applicant should review Item 6 and Appendix A on page 19 of this guide.

Transportation activities must be carried out in accordance with the requirements of 902 KAR 100:070 and U.S. Department of Transportation (DOT) regulations 49 CFR 172. It is your responsibility to become familiar with all applicable DOT regulations to help ensure safe transportation of radioactive materials. The applicable DOT regulations are outlined in 902 KAR 100:070, "Transportation of licensed material" (<http://www.lrc.state.ky.us/kar/902/100/070.htm>).

The major areas in the DOT regulations that are most relevant for transportation of typical portable gauges that are shipped as Type A quantities are:

1. Table of Hazardous Materials and Special Provisions 49 CFR 172.101 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartB.pdf>)
 - a. 49 CFR 172.101 - Purpose and use of hazardous materials table. [proper shipping name, hazard class, identification number]
 - b. Table 2, Appendix 2, 49 CFR 172.101 - List of Hazardous Substances and Reportable Quantities [for radionuclides]
2. Shipping Papers 49 CFR 172.200 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartC.pdf>)
 - a. 49 CFR 172.201 - General entries [on shipping papers]
 - b. 49 CFR 172.202 - Description of hazardous material on shipping papers
 - c. 49 CFR 172.203 - Additional description requirements
 - d. 49 CFR 172.204 - Shipper's certification [if applicable]
3. Package Markings 49 CFR 172.300 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartD.pdf>)
 - a. 49 CFR 172.301 - General marking requirements for non-bulk packagings
 - b. 49 CFR 172.304 - Marking requirements
 - c. 49 CFR 172.310 - Radioactive material [Type A or Type B]
 - d. 49 CFR 172.324 - Hazardous substances in non-bulk packaging [designation of "reportable quantities" with the letters "RQ"]
4. Package Labeling 49 CFR 172.400 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartE.pdf>)
 - a. 49 CFR 172.400(a) - General labeling requirements
 - b. 49 CFR 172.403 - Radioactive materials [types and contents of labels]
 - c. 49 CFR 172.406 - Placement of labels
5. Placarding of Vehicles 49 CFR 172.500 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartF.pdf>)
 - a. 49 CFR 172.504 - General placarding requirements
 - b. 49 CFR 172.516 - Visibility and display of placards

- c. 49 CFR 172.556 - RADIOACTIVE placard
- 6. Emergency Response Information - Subpart G (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartG.pdf>)
 - a. 49 CFR 172.600 - Applicability and general requirements
 - b. 49 CFR 172.602 - Emergency response information
 - c. 49 CFR 172.604 - Emergency response telephone number
- 7. Training - Subpart H (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part172-subpartH.pdf>)
 - a. 49 CFR 172.702 - Applicability and responsibility for training and testing
 - b. 49 CFR 172.704 - Training requirements (includes types of training, when it must be conducted, need for refresher training every three (3) years, recordkeeping (see <http://www.phmsa.dot.gov/hazmat/training/requirements>)
- 8. Carriage by Public Highway 49 CFR 177 (see <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-part177.pdf>)
 - a. 49 CFR 177.817 - Shipping paper [location of shipping papers during transport]
 - b. 49 CFR 177.842 - Class 7 (radioactive) material [includes requirement for blocking and bracing during transport]

Safety measures to be used in transporting the devices in the applicants' vehicle must be described. The gauge must be fully secured in the vehicle and away from the passenger area. The gauge must be transported in packaging that has been certified by the manufacturer as a Type A package. Alterations or modifications of the Type A package other than replacement of package specification markings and labels are prohibited by the licensee and can only be made by the manufacturer. Shipping papers are required to be carried with the gauge during transportation over public highways. The shipping papers must be carried in the passenger area of the transport vehicle either in the driver's side door pouch or on the seat next to the driver. Carrying shipping papers in any other manner, such as in the glove box or in the gauge transport case, will result in a cited violation during inspection. In response to Item 12.2 submit procedures for complying with applicable DOT regulations.

Appendix C on page 22 provides links to portable gauge manufacturer websites which include additional background information on gauge transportation and examples of shipping papers specific for each company's portable gauge including both the Bill of Lading and a copy of the Emergency Procedures as well as links to current special form certificates and Type A package testing results.

12.3 Storage and Securing of the Device

Means of preventing unauthorized access, use or removal of the gauges during use at temporary job sites must be described. Instructions should state that individual users are never to leave gauges unattended. Also a description of means of preventing unauthorized use or removal of the gauge from the designated place(s) of storage at

permanent and temporary job sites must be included.

12.4 Use of Personnel Monitoring

All personnel who are listed on the application as users must wear personnel monitoring devices when using the gauge and when servicing the gauge, if authorized by the license. Instructions should cover location on body where devices are to be worn (between the shoulders and waist on the front of the body), frequency at which they should be exchanged (monthly or quarterly) and where they are to be stored when not in use (definitely not with the gauges).

In addition to issuing personnel monitoring to all individuals using the gauges, the license applicant should commit in writing to maintaining a Utilization Log. The Utilization Log provides documentation of who actually used the gauge and should include the name of the user, the date gauge removed from storage, make, model and serial number of gauge, use location and date returned to storage. Records of Utilization Logs must be maintained for five (5) years. A copy of the utilization log form must be submitted with the application for review. If certain individuals who are currently named on the license but are not presently using the gauges, the Utilization Log serves as documentation that those individuals did not use the gauges during a certain period and thus did not require personnel monitoring during that time period. However, this option does not eliminate the need for personnel monitoring for any individual actually using the gauge.

In addition to the Utilization Log described above, the U.S. Department of Transportation regulation 49 CFR 172.201(e) Retention and Recordkeeping states "...A motor carrier using a shipping paper without change for multiple shipments of one or more hazardous materials having the same shipping name and identification number may retain a single copy of the shipping paper, instead of a copy for each shipment made, if the carrier also retains a record of each shipment made, to include shipping name, identification number, quantity transported, and date of shipment." Therefore, the facility may modify its Utilization Log to contain the proper shipping name, UN identification number, the activity of the source or sources in each device and the date of the shipment or else maintain a separate Shipment Record in accordance with DOT regulations. An example of a combined "Gauge Utilization Log & Permanent Shipping Paper Log" which meets both the requirements of the Radiation Health Branch and DOT for a single gauge can be found on page 41 of this guide.

12.5 Maintenance

Instructions should state that any maintenance (such as cleaning of the sliding block shutter mechanism) will always be performed with the radioactive source rod in the fully retracted "safe" shielded position in accordance with the manufacturer's procedures. Maintenance may not be performed unless the source rod is safely shielded. Be aware that cleaning of the shutter mechanism requires removal of the sliding block and while the source is in the "safe" position, the source itself is only partially shielded during cleaning. However, following the manufacturer's procedures for cleaning, a user will not receive an unsafe dose to the whole body or hands. All personnel performing maintenance activities must be issued personnel dosimetry and must wear that dosimetry at all times. To take the radioactive source out of the device, you must have special training and procedures, use a radiation survey meter, and take appropriate radiation safety precautions. Your license must specifically authorize any maintenance, repair, etc., that would involve

removing the source from the device or taking the source out of the safe shielded position. (See Appendix B.)

12.6 Leak-Testing

As a licensee you must test to determine whether or not there is any leakage from the radioactive source in the gauge. In the past, leak tests were normally performed at six (6) month intervals. However, recently many gauges and the sealed sources they contain have been approved by the manufacturer and their licensing authority for an extended twelve (12) month leak-test interval. To obtain a copy of the leak test intervals approved on the US Nuclear Regulatory Commission's Sealed Source and Device Registry (SSDR), contact the gauge manufacturer or else you may call the Radiation Health Branch at 502-564-3700 during normal working hours. Unless a specific request for the 12-month interval is included in the application, a 6-month interval will be specified in the license. Those gauges approved for the extended 12 month leak test interval will be listed as such on the license once granted.

The options for leak-testing are:

1. Engage the services of a licensed manufacturer, service provider or qualified consultant, to take samples, analyze the samples, and report the results to you.
2. Use a commercial leak-test kit. You take the smear/wipe and send it to the kit supplier, who analyzes the samples as authorized by their own license and reports the results to you.
3. You perform the entire leak-test sequence yourself, including taking the smears, analyzing the smears and generating the leak test reports.

For Option 1, specify the name, address, and license number of the licensed manufacturer, service provider or qualified radiation consultant (see <http://www.chfs.ky.gov/NR/ronlyres/04C06885-100C-4324-B5CA-F98B65354AA5/231819/RadPhysicistlistMay262010.xls>).

For Option 2, specify the kit model number and the name, address, and license number of the kit supplier. In your application, you should state the test samples will be taken by the individual designated as Radiation Safety Officer in Item 6 and that a copy of the leak tests instructions are available.

For Option 3, specify how and by whom the leak 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 measurements capable of detecting 185 Bq (0.005 μ Ci) of removable contamination should be used. Hand-held survey meters will NOT normally be considered adequate for leak test measurements. Include a sample calculation for conversion of the measurement data to microcuries and include the minimum detectable activity (MDA) for the instrument being used.

12.7 Inventories

902 KAR 100:015, Section 8 provides that the Cabinet may incorporate, in any license, such additional requirements and conditions with respect to the licensee's receipt, possession, use and transfer of radioactive material as it deems appropriate or necessary in order to, among other things, protect health or minimize danger to life or property. The

Cabinet requires that, periodically, licensees must account for all sealed sources and devices received and possessed under their licenses.

State that you will conduct inventories, at intervals not to exceed six (6) months, to account for all sealed sources and devices received and possessed under the license. You should maintain records of the inventories for at least three (3) years from the date of the inventory. Your inventory records should include: 1) the radionuclide and amount of radioactive material in each sealed source (in units of millicuries); 2) the manufacturer's name, model number, and serial number (if appropriate) of each device containing radioactive material; 3) the location of each sealed source and device; 4) the date of the inventory and 5) the name of the person conducting the inventory. See the model "Sealed Source Inventory Log" on page 37 as an example of an acceptable 6 month physical inventory.

12.8 Operating and Emergency Procedures

It is necessary to submit Operating and Emergency procedures to the Cabinet for review. You will need to:

- a. Commit to having and implementing operating and emergency procedures, as described in correspondence with the Cabinet;
- b. Commit to providing a copy of your operating and emergency procedures to all users of gauging devices before they begin using the gauges;
- c. Commit to having a copy of your operating and emergency procedures at each jobsite;
- d. Submit a copy of your operating and emergency procedures. Your procedures must include the requirements and prohibitions outlined in Appendix D on page 23, but should be more detailed to accommodate your particular situation. In addition, if the sealed source is to be lowered into the ground more than three (3) feet, then you also need to have:
 - (1) special procedures to minimize the possibility of the source being stuck or lost "down hole" due to collapse of dirt or concrete around the source, including procedures requiring the use of piping, tubing, or other casing material to line the hole from the lowest depth to 12 inches above the surface, and
 - (2) emergency procedures to recover a "stuck" source, including notifying the Cabinet, when it becomes apparent that recovery efforts will be unsuccessful.

Emergency procedures should include instructions to workers in case of accidents involving damage or loss of the gauges. These procedures should include names and telephone numbers of the individual(s) within the applicant's organization who should be notified and who would, in turn notify the local police and the Kentucky Radiation Health Branch. Emergency telephone numbers should also be included for the manufacturer. Contact telephone numbers for the Radiation Health Branch Office are: (502) 564-3700 during normal working hours (8:00 AM – 4:00 PM); (800) 255-2587 (toll free) after hours. A statement should be made that emergency procedures will be carried with the driver when the gauge is transported along with a Bill of Lading as part of the DOT required Shipping Papers for hazard class 7 radioactive materials. Shipping papers should be kept on the seat next to the driver or in the driver's side door pouch and visible at all times. Shipping papers are there for emergency responders should the driver ever be involved in an accident and be unable to communicate with the first responders.

12.9 Annual Audit of Radiation Protection Program

Section 2 of 902 KAR 100:019 requires licensees: (1) to develop, document, and implement a radiation program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the regulations; (2) to use procedures and engineering controls to achieve occupational doses and doses to members of the public that are ALARA; and (3) to review, at least annually, the content and implementation of their radiation programs. Section 30 of 902 KAR 100:019 requires licensees to maintain records of their radiation protection program. Licensees must maintain records of the provisions of their radiation protection program until the Cabinet terminates the license. Licensees must also maintain records of audits and other reviews of program content and implementation for three (3) years after the record is made (see <http://www.lrc.state.ky.us/kar/902/100/019.htm>).

The RSO needs to ensure that annual audits are conducted, but does not necessarily need to do it himself/herself. In fact, if the RSO is one of the authorized gauge users, it may be beneficial for a qualified individual (e.g., radiation safety consultant or the corporate radiation safety officer) who is not associated with day-to-day operations to conduct the audit.

The audit should be sufficiently detailed to ensure that (a) the licensee is abiding by Cabinet and DOT regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories; only trained, approved individuals use gauges independently), (b) the licensee's radiation protection program content and implementation achieve occupational doses and doses to members of the public that are ALARA; and (c) the licensee maintains all appropriate records with all appropriate information (e.g., records of personnel exposure, leak tests, inventory, training of gauge users) sufficient to comply with Cabinet requirements. Appendix E on page 26 describes an audit program that is acceptable to the Cabinet.

Submit the following:

- (1) the name and radiation safety qualifications of the individual who will conduct audits;
- (2) a description of the scope and extent of the audits;
- (3) a commitment to conduct audits at intervals not to exceed twelve (12) months and to maintain records of the audits for a least three (3) years after the record is made;
- (4) management's commitment to review the documented results of the audit promptly after the audit's completion; and
- (5) a commitment to take prompt action to correct deficiencies identified during audits, to inform all personnel (including those at other locations and those working under other licenses) of the deficiencies and the actions management expects its personnel to take to avoid similar deficiencies.

In lieu of describing the scope and extent of the audits, you may state, "We will conduct audits as described in Appendix E of "Guide for Preparation of Radioactive Material Applications for the use of Sealed Sources in Portable Gauging Devices", Revised 105/2012.

12.10 Maintaining of Records

Records required to be maintained in accordance with 902 KAR 100 and license conditions are to be maintained at one (1) central location in Kentucky at to be available for review by the Cabinet during normal working hours. Usually this is the address specified in item 1 of the application. If records will be maintained at a different location, the location must be specified. The record location chosen by the licensee will be designated on the license and the Cabinet will expect to find copies of ALL records required by the regulations and terms and conditions of the license.

Item 13 - Training and Experience of Users: User qualifications should include, as a minimum, the completion of a gauge manufacturer's radiation safety training course or other portable gauge radiation safety training program accepted by an Agreement State or the NRC. A certificate verifying training must be included with the application for each gauge user. All gauge users must also have current US DOT 49 CFR 172 subpart H hazmat training (<http://www.phmsa.dot.gov/hazmat/training/requirements>). A certificate verifying current hazmat training must also be included with the application for each authorized user. DOT hazmat training is valid for three (3) years from the date of training so the applicant should be aware of when each user's hazmat training expires. No person with expired hazmat training should be involved in packaging or transporting of nuclear gauges.

If an applicant desires to provide in-house gauge user radiation safety training for his/her own personnel, a description of the training must be provided, including topics covered in the training, time spent on each topic, and the name and qualifications of the instructor. The instructor should have training in radiation safety principles and practices and should have experience in the use of the device as specified in Appendix F on page 32.

Item 14 - Waste Disposal: The applicant must specify the means of transfer or disposal in the event the sealed sources will no longer be used. Sealed sources containing radioactive material may be returned to the manufacturer, transferred to another licensee authorized to possess the same material or transferred to a licensed waste disposal firm.

Before transferring radioactive material, you must verify that the recipient is properly authorized to receive it using one of the methods described in 902 KAR 100:040, Section 12. In addition you must package and ship the material in accordance with the Cabinet and DOT regulations and you must maintain records of the transfer as required by 902 KAR 100:040, Section 14. It is not enough just to say that you disposed of a gauge or transferred it to another licensee, you must also obtain written proof from the recipient attesting to the fact that they have taken physical possession of that licensed material.

Item 15 - Certification: If you are an individual applicant acting in a private capacity, you are required to sign the form. Otherwise, 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.

You should also submit the names of additional individuals authorized to sign on behalf of the licensee. This permits these individuals to sign correspondence sent to this office requesting license amendments or for responses submitted in regards to Inspection Letters. These individuals should be officers of the company or others with administrative

authority in regards to matters of radiation safety. For those individuals who are not members of senior management, they may be granted authority to sign amendment requests and make license commitments on behalf of senior management by submitting a signed copy of a Signature Authorization Form (see page 35)

V. AMENDMENTS TO A LICENSE

After you are issued 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; and (3) the Cabinet's regulations as specified in 902 KAR 100.

It is your obligation to keep your license current once granted. You should anticipate the need for regularly submitting license amendment requests to maintain the license as up to date and accurate as possible. If any of the information provided in your application is to later be modified or changed, including a change in RSO or authorized users, you should submit a request for a license amendment.

In the meantime, you must comply with the terms and conditions of your license until it is actually amended. Cabinet regulations do not allow you to implement changes on the basis of a submission requesting an amendment to your license.

A request for a license amendment may be prepared either on the Application Form RPS-7 or in a signed and dated letter and it should be submitted to the address specified in Section III of this guide.

Your amendment request should identify your license by number and should clearly describe the exact nature of the purposed changes. References to previously submitted information and documents should be clear and specific and should identify the pertinent information by date, page, and paragraph.

For example, if you wish to change the RSO specified in Item 6, your application for a license amendment should specify the new RSO's name and provide proof of training, and experience. The qualifications of the new RSO individual should be equivalent to those specified in Item 6 of this guide.

You must send the appropriate fee for the license amendment request in the form of a \$75 check or money order made payable to the Kentucky State Treasurer. The Cabinet will not accept an amendment request for filing or processing before the proper fee is paid in accordance with 902 KAR 100:012.

VI. RENEWAL OF LICENSE

An application for renewal of a license should be filed at least 30 days prior to the expiration date.

Renewal applications may be filed by completing the license renewal form sent by the Cabinet or in letter form. The renewal application should be signed and dated by a representative of the licensee's administrative management and should include the Kentucky radioactive material license number. It is recommended that all renewal checks also be clearly marked with the radioactive materials license number.

VII. TERMINATION OF A LICENSE

If you do not wish to renew your license, you must cease all licensed activities and promptly dispose of all licensed radioactive material you possess in a manner authorized by 902 KAR 100:021. After doing so, you must submit a completed copy of Form RPS-10 "Disposition of Radioactive Material," along with a completed Low Level Radioactive Waste Report (LLRWR) for the current calendar year. Copies of both can be found at <http://www.chfs.ky.gov/dph/radioactive.htm>. Also, you must submit a signed and dated letter specifically requesting that your license be terminated and indicating the manner in which you disposed of the facility's radioactive material along with the RPS-10. The RPS-10, LLRWR and letter requesting license termination must be sent to the Cabinet office at least thirty (30) days prior to the expiration date of your license. Include your Kentucky radioactive material license number in the termination request. There is no fee assessed for terminating a license but the license must be current and not expired.

If you cannot dispose of all the licensed radioactive material in your possession before the expiration date, you must submit a request for license renewal, along with the renewal fee, for storage only of the radioactive material. The renewal is necessary to avoid violating Kentucky Administrative Radiation Regulations that do not allow you to possess radioactive material without a valid license.

VIII. TRANSFER OF CONTROL OF A LICENSE

According to 902 KAR 100:040. General provisions for specific licenses. Section 11. Inalienability of Licenses. A license issued or granted under 902 KAR Chapter 100 or right to possess or utilize radioactive material granted by a license issued under 902 KAR Chapter 100 shall not be transferred, assigned, or otherwise disposed of, through transfer of control of a license to a person unless the Cabinet, after securing full information, finds that the transfer is in accordance with the requirements of 902 KAR Chapter 100 and gives its consent in writing (see <http://www.lrc.ky.gov/kar/902/100/040.htm>). Licensees must provide full information and obtain the Cabinet's prior written consent before transferring control of the license.

The Cabinet reviews requests for transfer of license control on a case-by-case basis and may require application for a new license and termination of the existing license. In order for a license to be considered for transfer of control, the licensee currently issued the license and the entity desiring to take control of that license, must submit a completed copy of the Form RPS-12, Transfer of Control of Radioactive Materials License to the Radiation Health Branch for evaluation and approval can be found in the "Forms" section at <http://www.chfs.ky.gov/dph/radioactive.htm>.

Transfer of control of licenses that were granted more than five (5) years previously and that have not been amended in their entirety five years after being granted as required by 902 KAR 100:040, Section 9(2), are usually not acceptable candidates for transfer of license control. In those cases, the Cabinet typically requires the entity wishing to take control of an existing facility to apply for and be granted in its own radioactive materials license after which the existing facility can transfer control of their radioactive materials to this new license and the old facility can then terminate its license.

APPENDIX A

DUTIES AND RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER

The Radiation Safety Officer (RSO) is responsible for implementing the radiation safety program and ensuring that radiation safety activities are performed in accordance with approved procedures and regulatory requirements.

The RSO's duties and responsibilities include ensuring:

1. Radioactive materials possessed under the license conform to the materials listed on the license.
2. Use of the devices, particularly in the field, is only by individuals authorized by the license.
3. All users wear personnel monitoring equipment, such as film badges, thermoluminescence dosimeters (TLD), or optically stimulated luminescence (OSLD) when required and reports of personnel exposure are reviewed in a timely manner.
4. Gauges are properly secured against unauthorized removal at all times when they are not in use.
5. Proper authorities are notified promptly in case of accident or damage to gauges, fire or theft.
6. Audits are performed at least annually to ensure that
 - (a) the licensee is abiding by Cabinet and DOT regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories, use limited to trained, approved users);
 - (b) the licensee's radiation protection program content and implementation achieve occupational doses and doses to members of the public that are ALARA (see 902 KAR 100:019, Section 2); and (c) the licensee maintains required records with all required information (e.g., records of personnel exposure, receipt, transfer, and disposal of radioactive material; gauge user training) sufficient to comply with Cabinet requirements.
7. Results of audits, identification of deficiencies, and recommendations for change are documented (and maintained for at least 3 years), provided to management for review, and prompt action is taken to correct deficiencies.
8. Audit results and corrective actions are communicated to all personnel who use radioactive material (regardless of their location or the license under which they normally work).
9. All incidents, accidents, and personnel exposure to radiation in excess of ALARA or 902 KAR 100:019 limits are investigated and reported to the Cabinet and other authorities, as appropriate, within required time limits.
10. Radioactive material is transported in accordance with all applicable DOT requirements.
11. Radioactive material is disposed of properly.
12. He/she has up-to-date copies of regulations 902 KAR 100, reviews new or amended regulations, and revises license procedures, as needed to comply with Cabinet regulations.
13. The license is amended whenever there are changes in: licensed activities, responsible individuals, or information or commitments provided to the Cabinet in the licensing process.

APPENDIX B

EXTENDED MAINTENANCE

If you are considering performing maintenance or cleaning of gauges that requires the removal of the radioactive source from the shielded position or removal of the source rod from the device (i.e., extended maintenance), you should keep in mind the radiation levels you may encounter. A typical moisture-density gauge contains 8-10 millicuries (mCi) of cesium-137 (Cs-137) and 40-50 millicuries (mCi) of americium-241/beryllium (Am-241/Be). In about 9 minutes, an unshielded cesium-137 source of this activity can deliver 5 rems to a worker's hands or fingers (i.e., extremities), assuming the extremities are 1 centimeter from the source. The threshold for extremity monitoring is 5 rems per year.

Thus, to perform extended maintenance, you must have special training, follow special procedures, use a radiation survey meter, use special shields, use special personnel monitoring devices, take appropriate radiation safety precautions and be specifically authorized by your radioactive materials to perform those activities. Accordingly, provide the following information:

1. Type of Work to be Performed

Describe the types of work, maintenance, cleaning, etc., that you wish to perform that necessitates removal of the radioactive source from the shielded position or the removal of the source rod from the device and correlate with the specific manufacturer's name and model number of the gauges on which you will perform extended maintenance.

2. Training and Experience

List the individuals who will perform extended maintenance and describe their training and experience in performing extended maintenance. Individuals are considered on a case-by-case basis.

For each individual proposed to perform extended maintenance, list all radiation safety courses the individual has had, the amount of hands-on experience the individual has had involving extended maintenance, including a correlation of manufacturer's name and model number gauge with the type and frequency of extended maintenance performed, and why you consider the individual competent to perform extended maintenance safely.

3. Handling Procedures

Submit your procedures for safe handling of the radioactive source while the source is outside the gauge. Your procedures should require that: the source rod will only be handled at the end opposite to the source end; the source end will be immediately place in a shielded container (e.g., lead shield); unauthorized individuals will not be allowed into the areas where extended maintenance is performed and where the source rod is located; containers shielding the source will be labeled "Caution Radioactive Material"; the source will be under constant surveillance of an authorized user when not in storage and will be secured against unauthorized removal or access when in storage; and the manufacturer's instructions and recommendations for performing extended maintenance will be followed.

4. Personnel Monitoring

Describe how you will ensure that radiation exposure to individuals performing extended maintenance will not exceed 902 KAR 100:019 limits. An acceptable response is: "Individuals performing extended maintenance on gauges will always wear both whole body and extremity monitoring devices; extremity devices, like the whole body devices, will be TLDs and exchanged at least quarterly."

5. Survey Instrumentation

If you have already provided detailed information on survey instruments in response to Items 8 and 9, state, "See response to Items 8 and 9." Otherwise, list the type and ranges of survey instruments you will have available, state the frequency of calibration, and who will perform the calibration. Also include how you will ensure that the survey instrument is working properly.

For example, you can state that a survey instrument capable of measuring between 0.1 millirem per hour and 100 millirems per hour will be used to perform the surveys and that the survey instrument will be calibrated annually by the manufacturer. Alternatively, you can identify by name, address, and license number an organization that is specifically licensed by NRC or an Agreement State to calibrate survey instruments for other licensees. In addition, you can state that, before each use of the instrument, you will check the response of the instrument with a dedicated check source that was supplied with the instrument and commit that, if the instrument does not respond properly, then you will not perform extended maintenance on the gauges until the survey instrument is repaired and operable or until you obtain an operable instrument.

6. Surveys

Describe how you will ensure that radiation levels in areas where extended maintenance will take place do not exceed 902 KAR 100:019 limits. For example, you can (1) commit to performing surveys with a survey instrument (as described above); (2) specify where and when surveys will be conducted during extended maintenance; and (3) commit to maintaining, for 3 years from the date of the survey, records of the survey (e.g., who performed the survey, date of the survey, instrument used, measured radiation levels correlated to location of those measurements), as required by 902 KAR 100:019.

6. REMINDER TO LICENSEE MANAGEMENT:

- a. Arrange for a survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. (This person could be a licensee employee using a survey meter located at the jobsite or a consultant.)
- b. Make necessary notifications to local authorities as well as to the Cabinet as required. Cabinet notification is required when gauges containing radioactive material are lost or stolen, or when gauges are damaged or involved in incidents that result in doses in excess of 902 KAR 100:019 limits.
- c. Timelines of reports to the Cabinet need to be considered.
- d. Reporting requirements are found in 902 KAR 100:019 Sections 38, 39 and 40 and 902 KAR 100:040, Section 18.

APPENDIX C

PORTABLE GAUGE TRANSPORTATION

Given the fact that different makes and models of portable nuclear gauges have different U.S. Department of Transportation record keeping and shipping requirements as far as Bills of Lading and Shipping Papers, Special Form Certificates, Type A Package Testing Results, etc. please refer to the links to the manufacturer's websites below for specific transportation guides and documents required for transporting the particular portable gauging devices possessed by your facility.

Troxler Electronic Laboratories

- Troxler Transportation Guide, Revision 5, June 2012
<http://www.troxlerlabs.com/downloads/pdfs/ship.pdf>
- Troxler Special Form Certificates
<http://www.troxlerlabs.com/safety/specialforms.php>
- Troxler instructions on "How to ship a nuclear gauge"
<http://www.troxlerlabs.com/products/shipgauge.php>

Instro Tek/CPN

- Special form certificates <http://instrotek.com/downloads#certificates>
- Type A package testing results <http://instrotek.com/downloads#reports>
- Transportation Index <http://instrotek.com/company/shipping/>
- CPN Transportation Guide
[http://clinettechnicalservices.com/yahoo_site_admin/assets/docs/CPN Transportation Guide.188190026.tif](http://clinettechnicalservices.com/yahoo_site_admin/assets/docs/CPN_Transportation_Guide.188190026.tif)

Humboldt Scientific

- Special form certificates, product manuals, etc.
<http://www.humboldtscientific.com/resources.html>

Seaman Nuclear

- Transportation guide <http://seamannuclear.com/Docs/TRSL3A-3.pdf>
- Type A package testing <http://seamannuclear.com/Docs/TypeACert.pdf>
- Shipping papers and emergency response information
<http://seamannuclear.com/transportation.htm#Forms>

APPENDIX D

SAMPLE OPERATING AND EMERGENCY PROCEDURES

It is necessary to submit operating and emergency procedures to the Cabinet for review (Item 12.9 of the licensing guide). In addition to information required by Item 12.8 of the licensing guide, you will need to:

- a. Commit to providing a copy of your operating and emergency procedures to all users of the device before they begin using it.
- b. Commit to having a copy of your operating and emergency procedures at each job site. Procedure should be carried in the cab of the transport vehicle by the driver, rather than in the transport case.

Emergency procedures should include steps for workers to take in case of accidents involving damage or loss of the devices. Accidents during transport, as well as accidents at temporary job sites should be addressed. An example of acceptable operating and emergency procedures is included below:

Sample Operating Procedures

1. Before removing the device from its place of storage, check to make sure that the source is in the shielded, locked position. Check the transport case to ensure required labels and markings are legible, and that the lock is operable. Lock the transport case.
2. Sign the device out in a log book (see Gauge Utilization Log Book), stating the dates of use, names of the authorized users who will be responsible for the device, and the temporary job sites where the device will be used.
3. Never leave the device unattended while in your custody.
4. Follow the applicable DOT requirements when transporting the gauge (block and brace the device in the rear of the transport vehicle, away from passengers; carry shipping papers (if applicable) and emergency procedures in the passenger compartment; etc.).
5. Do not expose your fingers, hands, or any part of your body to the radiation beam. Make sure the source is locked in the shielded position after each measurement is made.
6. Always wear your assigned film badge, thermoluminescent dosimeter (TLD) or OSLD when using the device (if applicable). Never wear another person's personnel monitoring. Never store your personnel monitoring near the device.
7. Always keep unauthorized persons away from the area where the device is being used.
8. Always maintain constant, line of sight, surveillance and immediate control of the device when it is not locked in storage.
9. When the device is not in use at temporary job sites, place the device in a secured storage location (e.g., locked in the trunk of a car or locked in a storage shed).

10. Return the device to its proper storage location at the end of the work shift.
11. When the device is returned to storage, indicate so on the source log.

Sample Emergency Procedures

If the source cannot be returned to the shielded condition (i.e., shutter will not close, for example, as a result of being damaged) or if any other emergency or unusual situation arises (e.g., the device is struck or otherwise damaged, dropped, or if the transport vehicle is involved in an accident which may involve damage to the device):

1. Immediately secure the area around the device. Cordon off the area around the gauge (approximately 15 foot radius) and prevent unauthorized personnel from entering the area to minimize personnel exposure. The gauge operator should stand by outside the cordoned area and maintain constant surveillance of the gauge until emergency response personnel arrive.
2. Prevent unauthorized persons from entering the secured area. Note: Emergency rescue, lifesaving and first aid efforts should not be delayed or hampered.
3. If heavy equipment is involved (e.g., device run over by vehicle), detain the equipment until it is determined that there is no contamination present. Gauge users and other potentially contaminated personnel should not leave the scene until they have been checked for contamination by emergency response personnel.
4. Notify licensee management of the situation, calling company personnel in the order listed below:

NAME	WORK PHONE	CELL PHONE
_____	_____	_____
_____	_____	_____
_____	_____	_____

*Fill in with (and update as needed) the names and telephone numbers of the Radiation Safety Officer (RSO) or other knowledgeable licensee staff to be contacted.

5. Follow the directions provided by the person contacted in step 4.
6. Notify Radiation Health Branch at the following numbers:
 - (502) 564-3700 (normal working hours – 8:00 AM – 4:30 PM Mon. – Fri. & Holidays)
 - (800) 255-2587 (Duty Officer after hours – toll free)
7. Manufacturer's phone number _____, if needed.

8. RSO and licensee management should:
- a) Evaluate the condition of the gauge. Determine if the source(s) are present and if they are in the shielded position (if applicable). If the source(s) are out of the gauge they must be located immediately.
 - b) Arrange for a radiation survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. This person could be a licensee employee with the proper training and a calibrated survey meter or a radiation consultant competent in the use of radiation survey meters (see <http://www.chfs.ky.gov/NR/rdonlyres/04C06885-100C-4324-B5CA-F98B65354AA5/231819/RadPhysicistlistMay262010.xls>). If neither is available, many fire departments and hazmat teams have calibrated survey meters and they can be contacted by calling 911. As a last resort, contact the Radiation Health Branch and our office will provide this service. Just be advised that most of our staff work out of Frankfort and if the incident occurs after hours, or on a weekend or holiday, it may take several hours for a Radiation Health Branch employee to arrive on scene. Most of the manufacturer's gauge operation manuals contain a radiation profile chart which gives the normal radiation levels near the gauge. The radiation survey readings can be compared to the radiation profile for the gauge contained in the gauge operation manual to determine if the readings are normal.
 - c) Make necessary notifications to local authorities as well as the Radiation Health Branch as required. Even if not required by regulation to do so, you may report any incident to the Radiation Health Branch by calling the Duty Officer at the State Emergency Operations Center toll free at (800) 255-2587. This number is staffed 24/7/365. Notification is required when gauges containing licensed material are lost or stolen, when gauges are damaged or involved in incidents that result in doses in excess of 902 KAR 100:019 limits, and when it becomes apparent that attempts to recover a source stuck below the surface will be unsuccessful. Reporting requirements and time frames are found in 902 KAR 100:019, Section 38. Reports of Theft or Loss of Licensed or Registered Sources of Radiation

APPENDIX E

SAMPLE AUDIT PROGRAM

An audit is conducted, in part, to fulfill the requirements of 902 KAR 100:019, Section 2 for an annual review of the content and implementation of the licensee's radiation protection program. It should also identify program weaknesses and allow licensees to take early corrective actions (before Cabinet inspection). During an audit, the auditor needs to keep in mind not only the requirements of the Cabinet regulations, but also the licensee's commitments in its applications and other correspondence with the Cabinet. The auditor should also evaluate whether the licensee is maintaining exposures to workers and the general public as low as is reasonably achievable (ALARA) and, if not, make suggestions for improvement.

The form in this Appendix can be used to document the annual audit of the radiation protection program. Guidance follows on completing each section of the form. Note any deficiencies that were identified and the corrective actions taken (or to be taken) in Section 15.

Section 1. Audit History. Enter the date of the last audit, whether any deficiencies were identified, and where actions were taken to correct the deficiencies.

Section 2. Organization and Scope of Program. Describe the scope of licensed activities at the audited location. Check whether the Radiation Safety Officer (RSO) is the person identified in the license and fulfills the duties specified in the license. Evaluate management involvement with the radiation safety program, whether the RSO has sufficient time to perform his/her duties and whether the licensee has sufficient staff to handle the workload and maintain compliance with regulatory requirements. Verify that only persons authorized by the license use/supervise use of devices, or perform servicing operations (if applicable).

Section 3. Training and Instructions to Workers. Ensure that workers have received the training required by 902 KAR 100:165, Section 3. Be sure that, before being permitted to use or supervise the use of a device, the authorized user has received training (as approved by the Cabinet) and has a copy of, and training in, the licensee's operating and emergency (O/E) procedures; records should be maintained. By interview and/or observation of selected workers, ensure that each has a copy of the licensee's O/E procedures and can implement them properly.

Section 4. Facilities. Verify that the licensee's facilities are as described in the license documents.

Section 5. Materials. Verify that the license authorizes the radioactive source-device combinations that the licensee possesses. Verify that the licensee uses the source-device combinations in accordance with license provisions. Ensure that devices are maintained in accordance with licensee commitments.

Section 6. Leak Tests. Verify that all radioactive sources are tested for leakage at the prescribed frequency and in accordance with licensee commitments. Records of results should be maintained for a period of three (3) years.

Section 7. Inventories. Verify that inventories are conducted at least once every six (6) months to account for all sealed sources; inventory records should be maintained for at least three (3) years.

Section 8. Radiation Surveys. Verify that the licensee has at least one (1) operable, calibrated survey instrument, if required, and that the instruments are calibrated in accordance with licensee commitments. Calibration records must be retained for three (3) years after the record is made. Check the radiation levels in the vicinity of authorized maintenance operations and immediately outside areas used for device storage are within regulatory limits. Verify that installation surveys are conducted, and records maintained.

Section 9. Receipt and Transfer of Radioactive Material (Includes Disposal). Verify that devices received from other (e.g., new devices) are in accordance with 902 KAR 100:019, Section 28. Ensure that device transfers are performed in accordance with 902 KAR 100:040, Section 12. Record of receipt, and transfer must be maintained in accordance with 902 KAR 100:040, Section 14.

Section 10. Transportation (portable devices only). Determine compliance with Department of Transportation (DOT) requirements. Verify that radioactive packages are prepared, marked, and labeled in accordance with 49 CFR Parts 172 and 173 requirements. Be sure that the licensee has records of performance testing of its special form sources and DOT-7A packages. Verify that shipping papers are prepared, contain all needed information, and are readily accessible during transport of Type A packages (49 CFR 172.200-204 and 177.718). Check that packages are blocked and braced (49 CFR 177.842). Furthermore, 902 KAR 100:040, Section 6. (4) requires that “A portable gauge licensee shall use a minimum of two (2) independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, if portable gauges are not under the control and constant surveillance of the licensee” (see <http://www.lrc.state.ky.us/kar/902/100/040.htm>).

Section 11. Personnel Radiation Protection. If required by the license, verify personnel dosimetry complies with 902 KAR 100:019, Section 12 and licensee commitments. Review personnel monitoring records; compare exposures of individuals doing similar work; determine reasons for significant differences in exposures. If any worker declared her pregnancy in writing, evaluate the licensee’s compliance with 902 KAR 100:019, Section 9 and 36 (see <http://www.lrc.state.ky.us/kar/902/100/019.htm>).

Section 12. Notification and Reports. Check on the licensee’s compliance with the notification and reporting requirements in 902 KAR 100:019, Sections 38-40 and 902 KAR 100:040, Section 18 (see <http://www.lrc.state.ky.us/kar/902/100/040.htm>).

Section 13. Posting. Check for compliance with the posting requirements of 902 KAR 100:165, Section 2 (see <http://www.lrc.state.ky.us/kar/902/100/165.htm>).

Section 14. Recordkeeping for Decommissioning. Check to determine compliance with 902 KAR 100:040, Section 15(7) (see <http://www.lrc.state.ky.us/kar/902/100/040.htm>).

Section 15. Problems or Deficiencies Noted: Recommendations. This section is self-explanatory.

ANNUAL AUDIT OF SEALED SOURCES AND DEVICES

Note: All areas indicated in audit notes may not be applicable to every license and may not need to be addressed during each audit.

Audit Report No. _____ License No. _____

Licensee's name and mailing address

Audit of activities at (Address):

Contact at Audit Location: _____

Telephone No.: _____

Date of Last Audit of this Location: _____

Date of This Audit: _____

Summary of Findings and Action:

No deficiencies

Deficiencies

Action on previous deficiencies

Recommendations:

Auditor: _____ Date: _____
(Signature)

1. AUDIT HISTORY

- A. Last audit of this location conducted _____
- B. Problems/deficiencies identified during last two audits or two years, whichever is longer () Y () N
- C. Any previous problem/deficiency repeated or not corrected () Y () N
Explain: _____

2. ORGANIZATION AND SCOPE OF PROGRAM

- A. Senior licensee management appropriately involved with radiation safety program and/or RSO oversight () Y () N
- B. Radiation Safety Officer
(1) Authorized on license () Y () N
(2) Fulfills duties as RSO (Appendix A of guide) () Y () N
- C. Use or supervision of use only by authorized Individuals. () Y () N

3. TRAINING AND INSTRUCTIONS TO WORKERS

- A. Instructions to workers (902 KAR 100:165, Section 3) () Y () N
- B. Authorized user training program – Before using gauge:
(1) User received training as described in license () Y () N
Application including training on O&E Procedures

4. FACILITIES – as described in license application () Y () N

5. MATERIALS

- A. Isotopes, quantities, mfg's name and model no. of sources and devices; use as authorized on license () Y () N
- B. Extended maintenance (if applicable) () Y () N
(1) Work requiring source in unshielded position by licensee in accordance with licensed procedures () Y () N

6. LEAK TESTS (902 KAR 100:060 and license condition)

- A. Leak tests performed as authorized by license (consultants, leak test kit, person performing) () Y () N
- B. Every 6 months or as authorized by license () Y () N
- C. Records with appropriate information maintained () Y () N

7. INVENTORIES
- A. Conducted at 6-month intervals () Y () N
- B. Records with appropriate information maintained () Y () N
(Date of inventory, radionuclide, quantities, manufacturer's name and gauge model number, location of sources/gauges, name of person conducting inventory)
8. RADIATION SURVEYS (if applicable)
- A. Calibrated and operable survey meter available, () Y () N
if required by license for extended maintenance
- B. Surveys conducted during maintenance operations () Y () N
- C. Records maintained () Y () N
9. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL (Includes Disposal)
- A. Describe how new devices are received and by whom: _____
- B. _____ () Y () N
Transfer(s) between licensees (including disposal)
- C. Records of receipt/transfer maintained () Y () N
(902 KAR 100:040, Section 14)
10. TRANSPORTATION (portable device users only) (902 KAR 100:070 and 49 CFR 170-189)
- A. Licensee shipments are:
- (1) Delivered to common carrier () Y () N
- (2) Transported in licensee's private vehicle () Y () N
- (3) Both () Y () N
- (4) No shipments since last audit () Y () N
- B. Packages
- (1) Authorized packages used () Y () N
- (2) Performance test records on file (Type A packages) () Y () N
- a. Special Form sources () Y () N
- b. DOT-7A packages () Y () N
- (3) Labels and markings as required, maintained () Y () N
in legible condition
- (4) Closed and sealed during transport () Y () N
- C. Shipping Papers (Type A packages)
- (1) Prepared and used () Y () N
- (2) Appropriate information included () Y () N
- (3) Readily accessible during transport along with () Y () N
emergency procedures

- D. Vehicles
- (1) Gauge blocked and braced () Y () N
- (2) Two physical barriers to prevent unauthorized access () Y () N
11. PERSONNEL RADIATION PROTECTION (if required)
- A. ALARA incorporated into Radiation Protection Program () Y () N
(902 KAR 100:019, Section 2)
- B. If required by license, external dosimetry provided and used () Y () N
- (1) Supplier _____ Frequency _____
- (2) Supplier NVLAP-approved () Y () N
- (3) Dosimeters exchanged at required frequency () Y () N
- C. Reports
- (1) Reviewed by _____ Frequency _____
- (2) Auditor reviewed records for period _____ to _____
- (3) Prior dose determined for new employees () Y () N
- (4) Maximum exposures _____
- (5) Worker declared her pregnancy in writing () Y () N
during audit period (review records)
If yes, determine compliance with 902 KAR 100:019, Sections 9
and 34
- (6) All records maintained of exposures, surveys, etc. () Y () N
12. NOTIFICATION AND REPORTS (902 KAR 100:019, Sections 38-40; 902 KAR 100:040, Section 18)
- A. License in compliance with notification/reports for:
- (1) Theft or loss () Y () N
- (2) Incidents () Y () N
- (3) Overexposures, high radiation levels () Y () N
13. POSTING (902 KAR 100:165, Section 2)
- A. Notice to Employees () Y () N
- B. Operating/emergency procedures () Y () N
- C. License or appropriate notice () Y () N
- D. Regulations or appropriate notice () Y () N
14. RECORDKEEPING FOR DECOMMISSIONING (if required) () Y () N
(902 KAR 100:040, Section 15)
15. **PROBLEMS OR DEFICIENCIES NOTED; RECOMMENDATIONS** Note: Briefly state (1) the requirements and (2) how and when violated. Provide recommendations for improvement.

Additional Remarks: _____

APPENDIX F - CRITERIA FOR TRAINING COURSES AND INSTRUCTOR QUALIFICATIONS

Part I: Criteria for Acceptable Training Courses for Portable Gauge Users

- Classroom courses must be at least 8 hours however on-line manufacturer courses accepted by the US NRC or Agreement States are taken at the pace of the student.
- Course should provide instruction in the following topics (the hours next to each topic are suggestions):
 1. Radiation Physics (0.5 hour for classroom instruction)
 - Atomic and Subatomic Structure
 - Radioactivity and Types of Radiation
 - Sources of Radioactivity
 - Isotopes and Periodic Table
 - Units of Radiation Measurement and Half-Life
 2. Radiation Safety (1.0 hour for classroom instruction)
 - Biological Effects of Radiation
 - Occupational Dose Limits
 - ALARA Methods to Reduce Dose – Time, Distance and Shielding
 - Personnel Monitoring
 - Radiation Versus Contamination
 - Internal Versus External Exposure
 3. Regulatory Requirements (1.5 hour for classroom instruction) (902 KAR 100)
 - Licensing and Inspecting by Regulatory Agency
 - Storage of Licensed Material
 - Constant Control and Surveillance of Radioactive Material Not in Use or Storage Including Two Independent Physical Barrier Requirement
 - Personnel Monitoring
 - Leak Testing and Location of Sealed Sources Inside Gauge
 - Inventory
 - Maintenance
 - Operating and Emergency Procedures
 - Audits
 - Recordkeeping and Need for Accurate and Complete Information
 - Reciprocity
 - Disposal
 - Incidents
 - Employee Protection
 - Deliberate Misconduct

If training courses and/or instructor qualifications do not meet the criteria in this Appendix, an applicant may submit the information requested in Item 13, to the Cabinet, as part of a request for a licensing action and the applicant's proposal will be considered on a case-by-case basis.

4. Transportation (0.5 hour for classroom instruction)
 - Requirements in 902 KAR 100:070 and 49 CFR
 - Transportation of Licensed Material in Vehicles
 - Blocking and Bracing Gauges
 - Two Independent Physical Barrier Requirement
 - Shipping by Common Carrier
 5. Gauge Theory, Operation, and Field Training 3.5 hours for classroom instruction)
 - Routine Maintenance and Cleaning
 - Setting Up and Taking Measurements
 - Constant Control and Surveillance of Gauges in Field
 6. Written Test and Test Review (0.5 hour each)
- Successful completion of the course requires obtaining a score of at least 80% on a closed-book test consisting of at least 50 questions that have not been provided to the students before the test
 - Course instructors must meet the qualifications outlined in Part II below

Part II: Criteria for Acceptable Qualification for Instructors of Portable Gauge Users

Each instructor who trains individuals as portable gauge users should have either:

- Bachelor's degree in physical or life sciences or engineering;
- Successful completion of a portable gauge manufacturer's gauge user radiation safety course or equivalent;
- Successful completion of a US DOT 49 CFR 172 subpart H hazmat course;
- Successful completion of an 8-hour manufacturer's Radiation Safety Officer course; and
- 8-hours minimum of hands-on experience in the use of portable gauge devices

Or

- Successful completion of a portable gauge manufacturer's gauge user radiation safety course or equivalent;
- Successful completion of a US DOT 49 CFR 172 subpart H hazmat course;
- Successful completion of a 40-hour Radiation Safety Officer course; and
- 30-hours minimum of hands-on experience in the use of portable gauge devices.

MODEL SIGNATURE AUTHORIZATION FORM

(To be submitted on company letter head)

Date: _____ (required)

Memo To: _____, Title of person being granted signature authority
(e.g., RSO, EH&S Supervisor, etc.)

From: _____, Title of Senior Management granting that authority
(e.g. Chief Executive Officer, President, etc.)

Subject: Delegation of Signature Authority for License Number _____

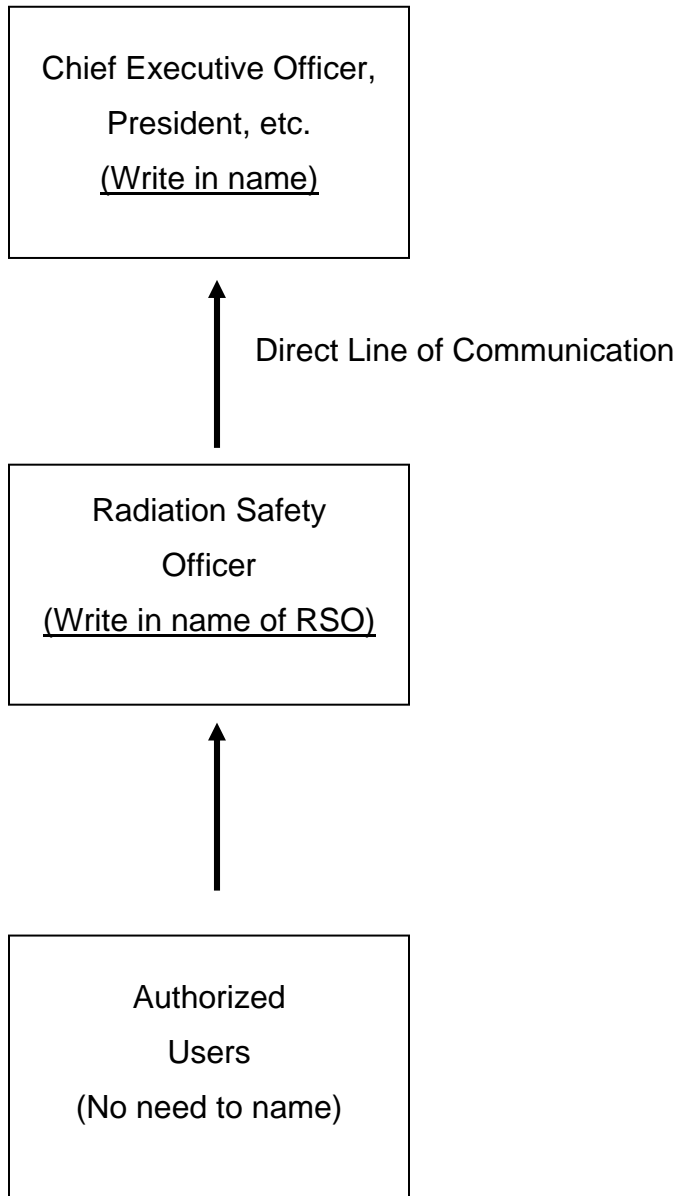
I hereby delegate authority to you for making commitments and signing amendment requests to the Kentucky radioactive materials license for _____ (write in name and address of license _____) on behalf of senior management. As a member of management, I recognize the radioactive materials license is a legal document that includes the application and all approved amendments. Furthermore, only management can obligate the institution and management is held accountable for the commitments in the license. In addition, I acknowledge that only a member of management has authority to provide necessary resources to achieve regulatory compliance. Necessary resources include finance, personnel, and physical plant.

Signature and Title of Management

I, _____ hereby I accept the above delegated authority.
(print name)

Signature of the authorized individual

MODEL ORGANIZATIONAL CHART WITH RESPECT TO THE RSO



New Security Requirements for Portable Gauges

Summary

The Cabinet for Health and Family Services (the Cabinet), the US Nuclear Regulatory Commission and all other Agreement States have imposed specific security requirements for portable gauges to reduce the opportunity for theft. Specifically, 902 KAR 100:040, Section 6. (4) A portable gauge licensee shall use a minimum of two (2) independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, if portable gauges are not under the control and constant surveillance of the licensee (see <http://www.lrc.state.ky.us/kar/902/100/040.htm>).

This rule would apply to a licensee with a portable gauge regardless of the location, situation, and activities involving the portable gauge. At all times, the licensee would be required to either maintain control and constant surveillance of the portable gauge or use a minimum of two independent physical controls to secure the portable gauge. The Cabinet expects that the physical controls would be designed and constructed of material suitable for securing the gauges from unauthorized removal. In addition, the Cabinet's expectation is that both of these controls must be defeated for the portable gauge to be removed to deter a theft by requiring a more determined effort to remove the gauge.

A. Securing a Portable Gauge at a Licensed Facility

Long term storage of a portable gauge is usually at a permanent facility listed in the license or license application. Under the new regulation, when a portable gauge is stored at a licensed facility, the licensee is specifically required to use a minimum of two independent physical controls to secure the gauge.

Examples of two independent physical controls to secure a portable gauge when stored at a licensed facility are:

1. The portable gauge or transportation case containing the portable gauge is stored inside a locked storage shed within a secured outdoor area, such as a fenced parking area with a locked gate;
2. The portable gauge or transportation case containing the portable gauge is stored in a room with a locked door within a secured building for which the licensee controls access by lock and key or by a security guard;
3. The portable gauge or transportation case containing the portable gauge is stored inside a locked, non-portable cabinet inside a room with a locked door if the building is not secured;
4. The portable gauge or transportation case containing the portable gauge is stored in a separate secured area inside a secured mini-warehouse or storage facility; or
5. The portable gauge or transportation case containing the portable gauge is physically secured to the inside structure of a secured mini-warehouse or storage facility.

B. Securing a Portable Gauge in a Vehicle

Licensees commonly use a chain and padlock to secure a portable gauge in its transportation case to the open bed of a pick-up truck while using the vehicle for storage. Because the transportation case is portable, a theft could occur if the chain is cut and the transportation case with the portable gauge in it is taken. If the licensee simply loops the chain through the handles of the transportation case, a thief could open the transportation case and take the portable gauge without removing the chain or the case. Because the transportation case is also portable, it must be protected by two independent physical controls if the portable gauge is inside. A lock on the transportation case or a lock on the portable gauge source rod handle would not be sufficient under the new requirements because the case and the gauge are portable.

A vehicle should be used for storage only for a short period of time when a gauge is in transit. A portable gauge should only be kept in a vehicle overnight if it is not practicable to provide temporary storage in a permanent structure. Under the new regulation, when a portable gauge is being stored in a vehicle, the licensee is specifically required to use a minimum of two independent physical controls to secure the gauge.

Some examples of two such independent physical controls to secure portable gauges in these situations include:

1. The locked transportation case containing the portable gauge is physically secured to a vehicle with brackets, and a chain or steel cable (attached to the vehicle) is wrapped around the transportation case such that the case cannot be opened unless the chain or cable is removed. In this example, the locked transportation case would count as one control because the brackets would prevent easy removal of the case. The chain or cable looped only through the transportation case handle is not acceptable;
2. The portable gauge or transportation case containing the portable gauge is stored in a box physically attached to a vehicle, and the box is secured with (1) two independent locks; (2) two separate chains or steel cables attached independently to the vehicle in such a manner that the box cannot be opened without the removal of the chains or cables; or (3) one lock and one chain or steel cable is attached to the vehicle in such a manner that the box cannot be opened without the removal of the chain or cable; or
3. The portable gauge or transportation case containing the portable gauge is stored in a locked trunk, camper shell, van, or other similar enclosure and is physically secured to the vehicle by a chain or steel cable in such a manner that one would not be able to open the case or remove the portable gauge without removal of the chain or cable. In this example, the transportation case would not count as one control because it could be easily removed.

C. Securing a Portable Gauge at a Temporary Jobsite (or at Locations Other than a Licensed Facility)

When a job requires storage of a portable gauge at a temporary jobsite or at a location other than a licensed facility, the licensee should use a permanent structure for storage if practicable to do so. When storing a portable gauge in temporary or permanent residential quarters, the licensee should limit access by storing the gauge in a separate

room away from residents and other members of the public. The licensee must also meet the radiation exposure limits specified the applicable regulations.

Under the new regulation, when a portable gauge is stored at a temporary jobsite or at a location other than an authorized facility, the licensee would also be required to use a minimum of two independent physical controls to secure the gauge.

Examples of two independent physical controls to secure portable gauges at these locations are:

1. At a temporary job site, the portable gauge or transportation case containing the portable gauge is stored inside a locked building or in a locked non-portable structure (e.g., construction trailer, sea/land container, etc.), and is physically secured by a chain or steel cable to a non-portable structure in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable. A lock on the transportation case or a lock on the portable gauge source rod handle would not be sufficient because the case and the gauge are portable;
2. The portable gauge or transportation case containing the portable gauge is stored inside a locked room within temporary or permanent residential quarters, and is physically secured by a chain or steel cable to a permanent or non-portable structure (e.g., large metal drain pipe, support column, etc.) such that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable;
3. The portable gauge or transportation case containing the portable gauge is stored in a locked garage, and is within a locked vehicle or is physically secured by a chain or steel cable to the vehicle in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable; or
4. The portable gauge or transportation case containing the portable gauge is stored in a locked garage, and is within a locked enclosure or is physically secured by a chain or steel cable to a permanent or non-portable structure in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable.

D. Controlling and Maintaining Constant Surveillance of a Portable Gauge

Under the new regulation, when a portable gauge is not secured with a minimum of two independent physical controls, the licensee would be required to control and maintain constant line of sight, visual surveillance of the gauge. This new rule has more specifically address the current requirements for security, and satisfy other regulatory requirements which state that the licensee shall control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. Control and constant surveillance is required when the gauge is not in storage (e.g., is in use or undergoing maintenance). The Cabinet interprets “control and maintain constant surveillance” of portable gauges to mean being immediately present or remaining in close proximity to the portable gauge so as to be able to prevent unauthorized removal of the gauge. See also Appendix H - NUREG 1556, Vol. 1, Rev. 1, (<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/v1/r1/>)



Application for a Kentucky Radioactive Materials License
Radiation Health Branch, Department for Public Health
Cabinet for Health and Family Services

RPS-7
6/2011

Completed applications must be filed with Radiation Health Branch, Cabinet for Health and Family Services, 275 East Main Street, Mailstop HS1C-A, Frankfort, KY 40621, Tel: 502-564-3700, Fax: 502-564-1492
 Application is for one of the following:

New License ⁽¹⁾ Check. _____	Amendment in Entirety ⁽¹⁾ of License No. _____	Amendment to ^(2, 3) License No. _____	Renewal of ^(2, 3) License No. _____
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(1) All sections must be completed **(2)** Complete all applicable sections & section 15 **(3)** Amendments & renewals cannot be combined

1. Applicant's Name and Mailing Address	2. Street address(es) where radioactive material will be Used (no P.O. Boxes)
--	--

3. Telephone Number	4. Person to be contacted and listed as contact person
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5. Individual(s) and Title(s) who will use or directly supervise use of radioactive material

6. Radiation Safety Officer (one person)	Training and experience required for each user named in Item 5 and for the Radiation Safety Officer in Item 6. For the RSO, duties and responsibilities of the RSO and updated organizational chart are required and if necessary, a signature authorization form.
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7. Licensed Material

Element & Mass Number A	Chemical and/or Physical Form B	Manufacturer Name & Model Number (if sealed source) C	Maximum activity (millicuries) per sealed source OR maximum activity possessed at any one time D	Maximum number of sealed source/device combinations possessed at any one time E
<u><i>For example</i></u> 1.A. Cs-137 2.A. Am-241	<u><i>For example</i></u> 1.B. Sealed Source 2.B. Sealed Source	<u><i>For example</i></u> 1.C. Troxler drawing number A-102112 2.C. Troxler drawing number A-102451	<u><i>For example</i></u> 1.D. No single source to exceed 9 millicuries 2.D. No single source to exceed 44 millicuries	<u><i>For example</i></u> 1.E. 5 sealed sources 2.E. 5 sealed sources

Describe use of radioactive material (Should be keyed to material in Subitem A above. For specific make & model of sealed source/device combinations in Subitem E above, state maximum number possessed at any one time)
For example

1. and 2. A.-E. to be used in a Troxler model 3400 series moisture density gauge to measure the properties of construction materials. Maximum possession limit 5 gauges.

8. Radiation Detection Instruments				
<u>Manufacturer</u>	<u>Model</u>	<u>Number Available</u>	<u>Radiation Detected (alpha, beta, gamma, neutron)</u>	<u>Sensitivity Range</u>
9. a) Calibrated by Service Company (Name, Address, and Frequency)			b) Calibrated by Applicant (Attach procedures describing method and standards used)	
10. Personal Monitoring Devices				
Type	Supplier		Exchange Frequency	
<input type="checkbox"/> (1) Film Badge <input type="checkbox"/> (2) TLD <input type="checkbox"/> (3) OSLD <input type="checkbox"/> (4) Other (specify)			<input type="checkbox"/> Monthly <input type="checkbox"/> Bi-monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Other (specify)	
11. Facilities and Equipment. Describe the facilities, remote handling equipment, shielding, fume hoods, etc. Attach a sketch of the facility indicating the location of any radioactive materials (i.e. fixed gauges, storage areas, etc).				
12. Radiation Protection Program. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Safety Officer, control measures, bioassay procedures, day-to-day general safety instruction to be followed, etc. If sealed sources are to be possessed, describe leak test procedures or if kit is used specify the manufacturer, model number of kit and person performing test. If radiation detection instruments are to be calibrated in-house or leak test swipes analyzed, submit detailed procedures and methods.				
13. Training and Experience of Users. Submit the formal training of each individual named in Item 5 and 6 indicating the name of persons or institutions providing the training, duration of training, and when training received in the areas of: A) Principles and practices of radiation protection. B) Radioactivity measurement standardization and monitoring techniques and instruments. C) Mathematics and calculations basic to the use and measurement of radioactivity. D) Biological effects of radiation.				
14. Waste Disposal. Describe the methods which will be used for disposing of radioactive waste.				
15. Certification. The applicant understands that all statements and representations made in the application are binding upon the applicant. The applicant and any official executing this certification on behalf of the applicant, named in Item 1, certify that this application is prepared in conformity with Kentucky Cabinet for Health and Family Services Administrative Regulations 902 KAR 100, and that all information contained herein, is true and correct to the best of their knowledge and belief.				
Signature of Certifying Management Official		Type/Printed Name		Title
				Date

PORTABLE GAUGE LICENSE APPLICATION CHECKLIST

1. Applicant and Use Location
 - Name, address, telephone #
 - Contact Person
 - Use location/storage
 - Organizational chart
2. Individual Users
 - Qualifications
 - Certificates included (gauge user & DOT hazmat)
3. Radiation Safety Officer
 - Qualifications
 - Duties & responsibilities
 - Delegation of authority
 - Signature authorization
4. Radioactive Material
 - Form
 - Manufacturer, model of source
 - Activity
5. Purpose
 - Manufacturer, model of gauge
 - Use
 - SS&D review checklist
 - Depth >3 ft.
 - Use of casing
 - Stuck source procedures
6. Training (if in-house)
 - Instructor qualifications
 - Course training manual & test
 - Topics covered adequate
7. Radiation Detection Instruments
 - Availability
 - Does type maintenance require use
 - Manufacturer, model, range
 - Frequency of calibration
 - Authorized person performs calibration
8. Personnel Monitoring
 - Name of company & NVLAP approval
 - Frequency of exchange
 - Who reviews reports
 - Committed to utilization log
9. Facilities
 - Means of storage, security, access control, key control, two independent barriers
 - Sketch of storage area including any occupied spaces (above, below, side to side)
10. Radiation Protection Program (written procedures)
 - A. Transportation procedures
 - Posting – Caution - RAM, KR-411, Operating & Emergency proc., License & regs or notice of where to locate
 - Secured away from passenger area/method, key control
 - Two independent physical barriers
 - Approved DOT container
 - Shipping papers including Emerg. Proc.
 - B. Prevention of unauthorized access/removal at temp. job sites and temp. storage
 - Never left unattended
 - Two independent physical barriers
 - C. Emergency procedures
 - To be carried with gauge
 - Persons to contact, telephone #
 - Telephone # Radiation Control
 - Proper procedures
 - If used at >3 ft., procedures to minimize “stuck” sources
 - D. Statement of user regarding maintenance
 - Maintenance procedures addressed
 - E. Leak tests
 - Frequency
 - Who performs wipe
 - Leak test kit model and instructions
 - Who performs analysis
 - F. Instructions for use and storage of badges
 - G. Inventory (6 mos.)
11. Annual Audit
 - Auditor
 - Scope
 - Frequency
 - Records maintained
12. Financial Assurance
 - Possession restricted
 - Certification
 - Cost estimate & decom. funding plan
 - Recordkeeping
13. Waste Disposal
14. Application Signed by Senior Management
15. Fee paid (\$390)