
RADIOACTIVE MATERIALS PROGRAM
GUIDE APPLICATION FOR INDUSTRIAL RADIOGRAPHY

State of Georgia Radioactive Materials Program Rev:Date 00:04/30/97
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I. PURPOSE OF GUIDE

If for any reason you feel confident that an application can be submitted without following this guide, please remember that any necessary information that is not submitted will delay completion of the review of your application.

Radiography, as used in this guide, means " the examination of the structure of materials by nondestructive methods, utilizing sealed sources of radioactive material." The radionuclides most commonly used for radiography are cobalt-60 and iridium-192.

The following Georgia Regulations apply and should be used in conjunction with this guide. The applicant or licensee should carefully read the applicable Regulations. This guide should not be considered as an all inclusive and complete substitution for understanding of the Regulations, training in radiation safety or developing and implementing an effective Radiation Protection Program.

- (1) **Rule 391-3-17-.02**, " Licensing of Radioactive Materials, Amended. "
- (2) **Rule 391-3-17-.03**, " Standards for Protection Against Radiation, Amended. "
- (3) **Rule 391-3-17-.04**, " Special Radiation Safety Requirements for Industrial Radiographic Operations, Amended. "
- (4) **Rule 391-3-17-.06**, " Transportation of Radioactive Materials, Amended. "
- (5) **Rule 391-3-17-.07**, " Notice, Instructions and Reports to Workers; Inspections, Amended. "

AS LOW AS IS REASONABLY ACHIEVABLE (ALARA) PHILOSOPHY

Georgia Rule 391-3-17-.03 (4)(b) states "The licensee shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA)." As an applicant, you must have an ALARA plan that embraces this philosophy when developing plans for working with radioactive materials.

This radiation safety program must be reviewed at least annually for the effectiveness of implementation. Licensees are required to maintain records of their radiation protection program until the Department terminates the pertinent license. Licensees must maintain records of the provisions of their radiation protection program until the Department terminates the pertinent license. Licensee must maintain records of audits and other reviews of program content and implementation for 3 years after the record is made.

II. FILING AN APPLICATION

Complete the form "Application for a Radioactive Materials License"(Appendix A). Complete Items 1 through 4 on the form itself. For items 5 through 13 submit the information on supplementary pages. Each separate sheet or document submitted with the application needs to be identified and keyed to the item number on the application to which it refers. All typed pages, sketches, or drawings should be on 8-1/2 X 11 inch paper to facilitate handling and review. Complete all items in enough detail for the Department to determine that your equipment, facilities, training and experience, and radiation safety program are adequate to protect health and to minimize danger to life and property.

All license applications and documents submitted to the Department will be available for review by the general public. Do not submit proprietary information unless it is absolutely necessary for the Department to use for evaluation of your application. The Department may withhold any document or part of a document from public inspection if disclosures of its contents is not required by law.¹ Any request for withholding is subject to a determination by the State of Georgia as to whether the document may actually be withheld in accordance with applicable laws and regulations.

Personal information about employees should not be submitted unless it is necessary. For example, the training and experience of employees need to be submitted to demonstrate their ability to manage radiation safety programs and to work safely with radioactive materials. Home addresses, home telephone numbers, dates of birth, social security numbers, and radiation dose information should not be submitted unless the Department specifically request it.

Prepare the application and supplements in duplicate. Submit the original copy to the Radioactive Materials Program where it becomes a part of the license if approved and keep an exact copy for your records.

III. CONTENTS OF AN APPLICATION

Item 1. License Information

Indicate whether this is an application for a new license, an amendment, or a renewal. If this is an amendment or a renewal, please identify the license number. An amendment request may be submitted in a letter form without using the application. For an amendment, the licensee must identify the GA. license number and give the business name. In all cases, the appropriate license fee must accompany the application in order for the review to begin. (See Item 12., License Fees, for the correct fee and mailing address)

Item 2.a. Name and Mailing Address of Applicant

Enter the applicant's name, mailing address, county, telephone number, and **Internet address** if applicable. The applicant should be the legal name of the corporation or other legal entity with direct control over the use of the radioactive material. If the applicant is an individual, the individual should be acting in a private capacity and the use of the radioactive material should not be connected to the individual's employment in a corporation or other legal entity.

Item 2.b. Street Address(es) of Use.

List each permanent facility used as a location of storage by the street address, city, and state or other descriptive address (such as on Highway 2 miles east of the intersection of Highway 10 and State Route 234, Any town State). The descriptive address should be sufficient to allow an Department inspector to find the location. A Post Office Box is not acceptable for Item 2.B. **A storage address must be an in-state storage address.**

¹A copy of the Georgia Open Records Law is available from the Georgia Law Library, for the cost of the photocopy. The telephone number for the library is (404) 656-3468.

If the device will be used at a permanent facility or facilities, give the specific address of each. Please identify the latitude and longitude coordinates of your facility(s), if you can provide this information. If you will conduct operations at temporary job sites, you should specify “temporary job sites” in the State of Georgia.

Item 3. Person to Contact

Enter the name and telephone number of the individual(s) responsible for this application and license. This individual should be familiar with the proposed radioactive materials program and be able to answer questions about the application. This individual is usually the person responsible for the radiation safety program and will serve as the point of contact during the review of the application and after issuance of the license. Notify the Department if the individual assigned this function changes. Notification of a contact change may **not considered a license amendment** unless the individual is the Radiation Safety Officer.

The individual named in Item 3. may or may not be the individual who signs the application in Item 13. on behalf of the applicant and who has the authority to make and implement commitments to the Department. However, any commitments made by the applicant must be signed by the individual named in Item 13. since only that individual is considered by the Department to have authority to make commitments on behalf of the applicant.

Item 4. Record Location

Indicate where records are to be maintained. If temporary job sites or multiple locations are being requested, records required a temporary job site must be maintained at that site until the completion of that job and all required records must be maintained at the main Georgia facility location as indicated in Item 2.A.

Item 5. Radioactive Material

The manufacturer and model number of the source must be keyed to the manufacturer and model number of the exposure device.

If source changers will be used, the source changers should be identified by the manufacturer and model number and should be keyed to the source device combinations with which they will be used.

If sources are to be used for instrument calibration or daily instrument checks and are not the same sources which will be used for performance of radiography, specific information concerning manufacturer, model number, and quantity of radioactive material should be specified.

The suppliers of equipment should be contacted concerning the model numbers of sources, devices, and source changers to assure that the information contained in the application is accurate.

All radiographic exposure devices and associated equipment used after January 10, 1996, shall comply with the requirements of 391-3-17-.04(4). The licensee shall maintain records to verify compliance with the Department regulations.

Note: Sources that exceed 200 Curies of iridium-192 and 100 Curies of cobalt-60 will not be

routinely approved for temporary job site use, because of the large area that requires surveillance. Sources that exceed these amounts should be used in shielded permanent facilities. If you wish to use sources in excess of 100 Curies of cobalt-60 or 200 Curies of iridium-192 at temporary job sites, you should provide specific information concerning where the sources will be used, the conditions of use, and how you will conduct surveillance to prevent entry into the restricted area. Your operating and emergency procedures (see Item 10. of this guide) should provide special instructions governing the use of such sources with particular emphasis on area surveillance.

Item 6. Purposes For Which Licensed Material Will Be Used

Specify the purposes for which the industrial radiography cameras/source exchangers you want to possess will be used. The industrial radiography cameras/source exchangers was designed and shall be in accordance with the manufacturer's recommendations for use.

Item 7. Individual Responsible For Radiation Safety Program And Their Training and Experience

Overall Organizational Structure:

Active control over the radiography program must be exercised by management personnel in positions of authority. (3) of Rule 391-3-17-.02. requires that the radiography applicant submit a description of the overall organizational structure pertaining to the radiography program, including specific delegations of authority and responsibility for the program.

Each individual in the line of authority should be identified by name and their duties and responsibilities relating to the radiography program should be described in detail. The training and experience of each individual which qualifies them to perform their duties and accept their responsibilities should also be described.

Those individuals in management who will be assigned duties established by the licensee for maintaining an active management control of the program should be identified.

The following list describes duties which may be performed by the licensee's management personnel. The individual(s) assigned these duties may bear the title of radiation safety officer, radiation protection officer or some similar designation. The list is not intended to be all inclusive nor should it be interpreted as a requirement that any person assume all of the listed duties. Specific information pertaining to your program should be submitted.

The specified duties of the RSO include, but are not limited to, the following:

1. To establish and oversee operating, emergency, and ALARA procedures, and to review them regularly to ensure that the procedures are current and conform with these Rules;
2. To oversee and approve all phases of the training program for radiographic personnel so that appropriate and effective radiation protection practices are taught;
3. To ensure that required radiation surveys and leak tests are performed and documented in accordance with these Rules, including any corrective measures when levels of radiation exceed established limits;
4. To ensure that personnel monitoring devices are calibrated and used properly by occupationally-

- exposed personnel, that records are kept of the monitoring results, and that timely notifications;
5. To ensure that any required interlock switches and warning signals are functioning and that radiation signs, ropes, and barriers are properly posted and positioned;
 6. To investigate and report to the Department each known or suspected case of radiation exposure to an individual, or radiation level detected, in excess of limits and each theft or loss of source(s) of radiation, to determine the cause and to take steps to prevent its recurrence;
 7. To have a thorough knowledge of management policies and administrative procedures of the licensee;
 8. To assume control and have the authority to institute corrective actions including shutdown of operations when necessary in emergency situations or unsafe conditions;
 9. To maintain required records;
 10. To ensure the proper storing, labeling, transport, and use of exposure devices and sources of radiation;
 11. To ensure that inventory and inspection and maintenance programs are performed in accordance with (5) of Rule 391-3-17-.04; and
 12. To ensure that personnel are complying with this Chapter, the conditions of the license, and the operating and emergency procedures of the licensee.

A Radiation Safety Officer (RSO) shall be designated on every industrial radiography license issued by the Department.

The RSO's qualifications shall be submitted to the Department and shall include: Possession of a high school diploma or a certificate of high school equivalency based on the GED test; completion of the training and testing requirements of (6)(a)2. of Rule 391-3-17-.04; and two years of documented radiation protection experience, including knowledge of industrial radiographic operations with at least 40 hours of active participation in industrial radiographic operations.

Item 8. TRAINING PROGRAM FOR INDUSTRIAL RADIOGRAPHY PERSONNEL; PERIODIC RETRAINING:

An applicant for a radiography license must have an adequate program for the training of their radiography personnel. Even if initial radiation safety training is provided by an outside entity, the licensee must have an in-house training program to provide the necessary training for radiographers and radiographers trainee in the operating and emergency procedures and use of equipment.

The applicant should provide a description of the program for training radiographers and radiographer trainees. The applicant should also provide further information concerning requirements for permitting individuals to act as radiographer trainees and/or radiographers. In the training program description include the sequence of events from the time of hiring through the designation of individuals as radiographer trainees and radiographers. Since (6)(a)1. and (6)(a)2. of Rule 391-3-17-.04 have specific

training requirements for radiographer trainees and radiographers, clearly differentiate between the training program for radiographer trainees and that for radiographers. In addition, differentiate between the training and examination given to individuals with no previous training and experience and that given to individuals with previous training and experience.

Note: Radiographers must be certificated to conduct industrial radiography in the State of Georgia.

A. Initial Training:

Provide an outline of the initial orientation training and instruction to be given to prospective radiographer trainees and individuals with previous experience and/or training.

B. Formal Forty-Hour Training Course:

1. Provide an outline of the course given. The course should include all topics in (9) of Rule 391-3-17-.04.
2. Specify the time to be spent on each topic.
3. Identify the course segments by title and instructor if they are to be conducted by guest speakers or instructors outside your organization.
4. Identify those topics not covered by a course, outside of your organization, such as your license conditions, operating and emergency procedures, the use and hazards of your radiography equipment and the time spent by your instructor on the identified topics.
5. A copy of textbook and references to be used must be submitted to the Department.
6. Submit a copy of a typical examination together with the correct answers to the examination questions. Indicate the passing grade and describe the reinstruction to be given in areas in which individuals are found to be deficient.

The " Comprehensive Forty-Hour Course Examination " should contain approximately 50 questions covering all items in (9) of Rule 391-3-17-.04.

Please note, the applicant shall notify the Department five days prior to conducting the "Formal Forty Hours Training Course."

C. Field Examination:

Provide a description of the field (practical) examination that will be given to prospective radiographers. The examination should be a practical demonstration of knowledge and ability to perform radiography and related tasks in compliance with your operating and emergency procedures and the Department regulatory requirements.

A list of subject areas for the field examination should be given and should include, as a minimum, performance of radiation surveys, posting, operating and emergency procedures, operations of equipment, and other items of radiation safety that may be encountered in the discharge of duties.

The comprehensive field examination should contain a minimum of 25 questions covering the applicant's operating and emergency procedures and the use of radiographic equipment would be considered to be an adequate examination to qualify individuals as a radiographer.

D. On-the-Job Training:

The period of on-the-job training under the supervision of an experienced radiographer instructor including radiographer trainee and previously trained radiographer's use and observation of the use of radiographic exposure devices and associated equipment, should be specified. However, no individual should be permitted to enter into on-the-job training until completing the requirements for a radiographer trainee. The content of on-the-job training and the minimum time that will be spent in it will be dictated by the applicant's scope of operation, the variety of the work, and the aptitude of the trainee and should be specified in the application.

A radiographer trainee cannot be considered part of a two-man crew unless under the supervision of the radiographer instructor.

Please note: A commitment that on-the-job training will be a minimum of 1 month full-time equivalent is required. This means a minimum of 30 days of actual work performing radiography and associated operations.

E. Previously Trained Radiographers and Prospective Radiographer Trainees:

Because of differences in procedures, equipment, etc., it is unlikely that a new employee will be adequately prepared to work in a particular program without some training specifically related to that program. Also, each licensee is required by (6)(a) of Rule 391-3-17-.04 to determine that each individual is qualified to act as a radiographer or radiographer trainee in its own program. The applicant should therefore describe the procedure for determining the knowledge and competency of individuals and for providing additional training if needed.

F. Periodic Training:

Periodic training should include a description of the content and scheduling of the training session given for the purpose of ensuring (1) the knowledge and proficiency of radiographers and radiographer trainees with respect to new regulations, procedures, policies, and equipment and (2) continuing proficiency with present equipment and procedures. Periodic training should be conducted at least annually.

G. Minimum Personal Radiation Safety Requirement For Each Radiographic Personnel

"Radiographer trainee" defined as any individual who, under the personal supervision of an instructor, uses sources of radiation, related handling tools or radiation survey instruments during the course of their instruction.

The licensee shall not permit any individual to act as a radiographer trainee until such individual:

1. has been instructed in the subjects outlined in (9) of Rule 391-3-17-.04;
2. has received copies of, and instructions in, Department regulations contained in this part and in

the applicable requirements of Rule 391-3-17-.03, Rule 391-3-17-.07, license(s) under which radiography is performed, and the licensee's operating and emergency procedures.

"Radiographer" defined as any individual who performs or personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of Chapter 391-3-17 and all license conditions.

The licensee shall not permit any individual to act as a radiographer until such individual:

1. has been instructed in the subjects outlined in (9) of Rule 391-3-17-.04,
2. has provided the Department with documentation showing completion of at least 30 days of on-the-job training by a radiographer instructor as a radiographer trainee following completion of the requirements in (6)(a)1. of Rule 391-3-17-.04;
3. has received copies of, and instructions in Department regulations contained in this part and in the applicable requirement of Rule 391-3-17-.07, license(s) under which the radiographer will perform radiography, and the licensee's operating and emergency procedures;
4. has demonstrated competence to use the licensee's radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments; and
5. has demonstrated an understanding of the instructions required by (6)(a)2. by successful completion of a written test and a field examination on the subjects covered.

"Radiographer instructor" defined as any individual who has been authorized by the Department to provide instruction to radiographer trainees in accordance with 391-3-17-.04(6)(a).

No individual shall act as a radiographer instructor unless such individual:

1. Has met the requirements of a radiographer, as specified in Rule 391-3-17-.04;
2. Has one year of documented experience as a radiographer; and
3. Has been named as a radiographer instructor on the license issued by the Department.

Instructor's Qualifications:

The person who makes the final determination of the adequacy of a prospective radiographer's knowledge and competency should be a qualified radiographer instructor with a strong background of training and experience with radiation. On-the-job training must be given by someone who is, as a minimum, a qualified radiographer instructor.

Records:

A copy of tests given to each radiographer trainee and prospective radiographer, records showing their performance in each examination (including oral and practical examinations), and the examiner's overall

evaluation of the radiographer trainee and prospective radiographer as qualified to act as a radiographer must be maintained for a period of three years.

Item 9. FACILITIES AND EQUIPMENT

The Department of Natural Resources will not authorize permanent storage of radiographic exposure devices, source changers, or transport containers that contain radioactive material in areas zoned as residential, as required by (5)(c)2. of Rule 391-3-17-.04.

Please describe the permanent storage facility for radioactive material. This description should include the following.

- (a) A description of the storage vault including a drawing with dimensions and shielding details. Survey information, if available, should be supplied.
- (b) A description of the security measures provided to prevent unauthorized removal of devices containing radioactive material.
- (c) A description of the building in which the storage vault is located, its relationship to other buildings in the area (especially to occupied office areas) and a description of the security provided by the building to prevent any unauthorized entry into the storage vault.
- (d) Posting of the vault and the storage area.

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

- (a) A detail of the storage vault or container that is provided on transporting vehicles, including dimensions and shielding information.
- (b) Posting of temporary storage facilities.
- (c) Precautions that will be taken to prevent unauthorized removal of radioactive material from temporary storage facilities.

If a permanent, shielded facility will be used for performance of radiography, a detailed description of the facility should be submitted which includes the following:

- (a) Annotated drawings or sketches of the facility and its surrounding, including (1) dimensions of each enclosed area, (2) thickness, density, and type of shielding material on all sides, and below, (3) identification of entrance ways, and (4) a description of the nature of, and distances to, all areas adjacent to, above, and below each exposure area.
- (b) A description of the area security safeguards, such as locks, signs, warning lights and alarms, and interlocking systems for each enclosed exposure area and adjacent areas. Particular attention should be given to the description of the high radiation area entrance controls that are required by (5)(I) of Rule 391-3-17-.04.

- (c) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be activated by radiation whenever the source is exposed. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed.
- (d) The control device or alarm system shall be tested for proper operation at the beginning of each period of use. Records of such tests shall be maintained for inspection by the Department until it authorizes their disposal.

Include the results of calculations or radiation level measurements showing maximum anticipated radiation levels in all area adjacent to each exposure area including the roof or ceiling. As a basis for calculations, the type of source, quantity of activity in the source, and position of the source within the facility should be identified.

The objective of a shielded facility is to permit performance of radiography within the facility so that areas outside the facility may be considered unrestricted areas and will meet the radiation level limitations in (5)(I) of Rule 391-3-17-.03. A radiation level of not more than 2 milliroentgens per hour at a distance of 18 inches from any external surface of the facility will be considered acceptable for considering the area as an unrestricted area.

Item 10. RADIATION SAFETY PROGRAM

The applicant for a license to use industrial radiography sources is required to develop a comprehensive radiation protection program to ensure the safety of the general public and its employees. The following is intended only for general guidance in the preparation of the license application and should not be considered a substitute for the applicant's careful safety evaluation of the proposed use of sealed sources and devices.

(6)(b) of Rule 391-3-17.04 requires each licensee to provide radiography personnel with operating and emergency procedures. The purpose of these procedures is to provide radiography personnel with clear and specific instructions in specific topics and other duties and responsibilities which radiography personnel may have. Other duties could include instrument calibration, leak testing, quarterly inspection and preventive maintenance of equipment, and shipment of sources and devices. The operating and emergency procedures for personnel should not contain information which does not apply specifically to the duties of radiography personnel; for example training program description, management control program etc.

The operating and emergency procedures should be tailored to fit the program proposed in the application. The procedures and instructions should be complete and self-contained in a single document. Information contained in equipment manuals and other publications should be extracted and placed into the operating and emergency procedures so that the instructions to personnel are clear, specific, and appropriate for the proposed program. The instructions contained in the operating and emergency procedures should be in language which can be easily understood by radiography personnel.

There is no specific format for operating and emergency procedures. A sequential set of instructions which covers radiography operations from the beginning of the work day to the end of the workday is an acceptable format.

The following comments may be helpful with respect to the topics which should be included in the operating and emergency procedures.

(a) Handling and Use of Licensed Sealed Sources, Radiographic Exposure Devices, Source Exchangers and Instrument Calibration Equipment

Step-by-Step instructions of the "cookbook" type for the use and handling of radiographic exposure devices and related equipment should be provided. When appropriate, the procedures should include instructions for use of radiation collimating cones or their auxiliary shielding material.

If source exchange will be performed by radiography personnel, step- by-step instructions for source exchange including surveys to be performed during the source exchange and for shipment and acceptable radiation levels for the surveys should be in the procedures.

If radiography personnel will perform instrument calibration, step-by-step instructions including radiation safety precautions and procedures to be followed should be in the procedures.

(b) Methods and Occasions for Conducting Radiation Surveys

The procedures should identify when surveys shall be made, specifically what should be surveyed, and acceptable radiation levels for the survey.

In general, a survey should be performed each time a source is manipulated or moved. Surveys which need to be performed include:

- (1) Determination after each exposure that the source has returned to the safe storage position. This survey should include both the guide tube, if appropriate, and the device itself.
- (2) Determination of the perimeter of the restricted area.
- (3) Determination of radiation levels at external surfaces of storage facilities.
- (4) Determination of radiation levels in and around vehicles used for transporting sources and devices.
- (5) Determination that the source is in a safe storage position prior to securing a radiographic exposure device or storage container.
- (6) Determination that containers prepared for shipment comply with the requirements in Department of Transportation regulations (10 Mr/hr. at 3 feet from any surface and 200 mR/hr. at the surface of the container).

The acceptable radiation levels for surveys should be expressed in milliroentgens per hour. Radiation levels should not be expressed in terms of potential dose.

(c) Methods for Controlling Access to Radiographic Areas

Instructions for controlling access to radiographic areas should be specifically stated in the procedures.

The perimeter of the restricted area and the perimeter of the high radiation must be posted. "Caution (or Danger) - Radiation Area" signs should be posted at the perimeter of the restricted area and "Caution (or Danger) - High Radiation Area" signs should be posted at the perimeter of the high radiation area. The use of high radiation area signs are not acceptable for use at the perimeter of the restricted area; these signs should be used only at the perimeter of the high radiation area. Signs, by themselves, do not provide an adequate means of access control. For radiographic operations performed outside of a permanently established, shielded facility, instructions requiring surveillance of the area to prevent unauthorized persons from entering the area are necessary. For permanently established facilities, specific instructions concerning use of inter-locking devices and systems, locking of the facility, security of keys, use of warning lights, etc. should be included in the procedures.

The instructions for control of access to permanently established facilities should be separate and distinct from the instructions for temporary site operations.

A specification of a radiation level of 2 milliroentgens per hour for the perimeter of the restricted area and 100 milliroentgens per hour for the perimeter of the high radiation area is acceptable. A physical survey with a survey meter should be performed to confirm the 2 milliroentgen per hour radiation level for the restricted area after the source has been exposed. It is neither necessary nor desirable for physical survey to be made to confirm the radiation level at the perimeter of the high radiation area since such a survey could lead to unnecessary exposure of personnel.

(d) Methods and Occasions for Locking and Securing Radiographic Exposure Devices, Storage Containers, and Sealed Sources

There should be an instruction which requires locking of the exposure device after completion of the survey to determine that the source has returned to the shielded position as required by (7) (c) of Rule 391-3-17-.04.

Instructions and procedures for storage of sources and devices at both permanent and temporary job sites including posting of storage areas and surveys around the storage areas should be in the procedures. The area outside storage areas should be considered an unrestricted area.

(e) Personnel Monitoring and the Use of Personnel Monitoring Equipment

The instructions should contain requirements for radiography personnel to wear their personnel monitoring devices so that any exposure received will be accurately reflected by the devices. The instructions should be specific.

Frequent reading of pocket dosimeters should be required so that personnel may be aware of exposure which they may have received. An instruction concerning steps which must be taken immediately by radiography personnel in the event a dosimeter is found to be off-scale should be in the procedures. This instruction should include the requirement stated in (6) (c) of Rule 391-3-17-.04 that an individual's film badge, thermoluminescent dosimeter (TLD), optically-stimulated luminescence dosimeter (OSL), or other such device be processed immediately if that individual's pocket dosimeter is discharged beyond its range. Instructions for storage of personnel monitoring devices should be in the procedures.

The name of the supplier of the film badge, TLD, OSL, or other dosimeter should be identified. The frequency of exchange of the dosimeters should be specified.

The manufacturer, model number, and range of pocket dosimeters to be used should be identified. Procedures for checking pocket dosimeter exposures and energy response, as required by (6)(c)7. of Rule 391-3-17-.04 should be described.

The manufacturer and model number of alarm ratemeters to be used should be identified. Procedures for checking alarm ratemeter's alarm signal at a preset dose-rate of 500 Mr/hr as required by (6)(c)9. of Rule 391-3-17-.04 should be described.

(f) Transporting Sealed Sources to Field Locations, Packaging of Exposure Devices and Storage Containers, Posting of Vehicles and Control of Sealed Sources During Transportation

The transport over public roads of radiography sources in exposure devices or storage containers is subject to the regulations of the U.S. Department of Transportation. These regulations cover, among other things, permissible radiation levels around and within a vehicle and placarding of the vehicle during transport. In those cases in which the U.S. Department of Transportation regulations are not applicable, such as intrastate transportation, Rule 391-3-17-.06 requires conformance to the standards and requirements of the U.S. Department of Transportation.

The procedures should contain instructions on how exposure devices or storage containers should be secured within the transporting vehicle to prevent shifting within the vehicle. There should be instructions for placarding of the vehicle during transport. The DOT regulations require "RADIOACTIVE" placards on all 4 sides of the vehicle. There should be instructions for surveys in and around the vehicles. For the passenger compartment, the radiation level should not exceed 2 milliroentgens per hour. Although not specifically required for transport, there are occasions when the vehicle may be used for storage and the area outside the vehicle must be considered an unrestricted area so that a specification of a radiation level of 2 milliroentgens per hour at a distance of 18 inches from any external surface of the vehicle should be provided.

When a vehicle is used for storage, the posting requirements in Rule 391-3-17-.03 are applicable. Therefore, a vehicle when used for storage should be posted with "Caution - Radioactive Material" signs. As noted above, the area outside a parked vehicle used for storage is an unrestricted area and the radiation level at the surface of the vehicle should not exceed 2 milliroentgens per hour at 18 inches from the surface of the vehicle.

(g) Minimizing Exposure of Persons in the Event of an Accident

Instructions to personnel should include procedures for minimization of exposure to persons in the event of an accident or other unusual occurrence. Possible malfunctions of equipment should be considered and steps to follow in each case of malfunction should be specifically set forth.

The procedures should contain clear and specific instructions concerning emergency situations. The steps to be taken by radiography personnel should, in general, be limited to (1) surveying the area, (2) establishing a restricted area, (3) notifying appropriate persons, and (4) maintaining direct surveillance and control over the area until the situation is corrected. Limitations on action which may be taken by radiography personnel should be clearly specified. The attempted recovery of a source that has become detached from an exposure device, and operation that may result in exposure to high levels of radiation, should not normally be attempted by radiography personnel without qualified help.

(h) The Procedure for Notifying Proper Persons in the Event of an Accident

The names and telephone numbers of the persons to be contacted in case of an accident should be specified.

(i) Record Keeping

The instructions to personnel should specify those records which must be maintained by them during the course of their work. Among those records which are normally made by radiography personnel are dosimeter readings, surveys, and daily inspection of equipment. Other records should be included if they are the responsibility of radiography personnel.

Records for which management and supervisory personnel have responsibility should not be included in the operating and emergency procedures.

(j) Inspection and Maintenance of Radiography Exposure Devices, Storage Containers and Source Changers

(5) (h) of Rule 391-3-17-.04 requires a check for obvious defects in radiographic equipment prior to each day the equipment is used. The procedures should contain specific instructions for inspection of equipment and the actions to be taken if any defects are found.

A check-list should be contained in the procedures concerning the items which should be covered in the daily inspection. Equipment manufacturers may be helpful in providing information concerning daily inspections.

Quarterly inspection and preventive maintenance of equipment should be carried out. If radiography personnel will conduct these inspections, clear and specific instructions for inspection and maintenance should be in the procedures. As part of the inspection and preventive maintenance program, all connectors, drive cables, source guide tubes, on-off indicator mechanisms, and all moving parts should be checked for defects and excessive wear. Cables should be cleaned and lubricated and all defective and excessively worn components repaired or replaced. If components essential to the safe operation of the device are found to be defective, or in poor operating condition, the device should be immediately removed from service until repairs can be made. Instructions for performance of such inspections should be in the procedures if they are performed by radiography personnel.

(k) Off-Scale Pocket Dosimeter Readings

Procedures to be taken immediately by radiography personnel in the event a pocket dosimeter is found to be offscale should include the following instructions:

- (1) Stop work immediately.
- (2) Initiate emergency procedures if the source is exposed and cannot be retracted; otherwise, retract the source safely to a shielded position.
- (3) Notify the radiation safety officer immediately. In this regard the name of the radiation safety officer and the manner in which this individual can be reached should be included.

(l) Product Malfunctions and Defects

If the radiographer discovers any malfunction or defect in the equipment, the radiographer should notify the radiation safety officer. Procedures to be followed in such an event should tell the radiographer what to report, when to report the problem, and the individual to whom it should be reported.

(m) General Instrumentation

Instruments should be identified by manufacturer, model number, and range of instrument. For instruments to be used for surveys, the instruments must have a capability of measuring a minimum of two milliroentgens per hour through one roentgen.

(5)(d) of Rule 391-3-17-.04 requires that radiation survey instruments used in radiographic operations be calibrated at intervals not to exceed three months and after each instrument servicing. The small check sources are not acceptable for calibration purposes, these check sources are only acceptable for daily radiation response for survey instruments. To properly calibrate a survey instrument, its response must be checked at two or more points on each scale with a source of gamma radiation of appropriate strength and energy. The highest and lowest points checked on each scale should be separated by at least 50% of the scale. If the instrument's readings correspond to calculated values within a range (-/+ 20%), the instrument may be considered properly calibrated.

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

- (a) The type (radioisotope, manufacturer, model number) and activity of source to be used. (NIST traceable)
- (b) The specific procedures to be used for calibration including radiation safety procedures to be followed for use of the source.
- (c) The name and pertinent experience of each individual who will perform instrument calibration.

If radiographer instructors or radiographers perform instrument calibration, specific instructions and procedures should be written for use by radiographer instructors or radiographers.

If instrument calibration will be performed by an organization other than the applicant, the following information should be included in the application.

- (a) The name and address of the organization.
- (b) A description of the calibration procedure.
- (c) A copy of the kind of data concerning the instrument calibration which will be furnished to the applicant.

(n) Leak Tests

Distributors of sealed sources usually supply a certificate with each source giving the results and date of the last leak test performed on a source. If such a certificate is not received, the source is not to be used

until a leak test has been performed and the results of the test received showing that the source is not leaking or contaminated. Thereafter, the source must be tested for leakage and contamination at intervals not to exceed six months. Records of the testing of each source, identifying the source tested, date of the test and the results of the test in units of microcuries, must be maintained for Department inspection.

The leak testing of sealed sources may be performed only by persons who are specifically authorized by the Department, another Agreement State, or the U.S. Nuclear Regulatory Commission to do so. In establishing a program for leak testing, you may choose one of three approaches:

- (a) You may utilize the services of a consultant or commercial organization licensed by the Department, another Agreement State, or the U.S. Nuclear Regulatory Commission to take the necessary test samples ("smears"), evaluate the samples and report the results to the customer. The name, address, and license number of the consultant or commercial organization should be specified in your application.
- (b) You may be licensed by the Department to use a commercially available leak test kit. Your application should specifically identify each kit you may wish to use by designating the kit supplier and model number. Only those leak test kits which are specifically identified will be authorized. Your application should identify by whom the leak test (using the kit) will be performed. If radiographic personnel will perform the leak test, specific instructions should be included in the operating and emergency procedures for personnel. The instructions and procedures provided by leak test kit suppliers should be modified to fit your program. For example, many kit procedures indicate that the manufacturer of the source should be notified if a survey of the leak test sample indicates a potentially leaking source. Instructions to radiographic personnel should indicate that management should be informed since dealing with suppliers is usually a management function.
- (c) You may be licensed by the Department to perform your own leak tests, including taking and evaluating the smears. Should you desire to conduct your own leak tests, you should submit the information required by (3)(e) of Rule 391-3-17-.04. This should include a description of the instrumentation to be used in evaluating the smear, including its sensitivity and accuracy, and a description of your calibrating and standardizing procedures, with a sample calculation showing conversion of results to the required microcurie units. Survey instruments are generally not designed for such measurements and may not be acceptable for this use. A description of the material to be used in taking the smears, the points on the equipment which will be smeared (smears are not normally taken directly from the surface of a source -- see (5)(e) of Rule 391-3-17-.04), the radiation safety procedures to be followed during the smearing process, the method for handling and disposing of the smears and the training and experience of each person who will take or evaluate the smears which qualifies him for each task should also be included. If radiographic personnel will perform the test, specific instructions should be contained in the operating and emergency procedures.
- (o) Picking Up, Receiving, and Opening Packages:

(11)(f) of Rule 391-3-17-.03 contains requirements for picking up, receiving, and opening packages. The application should include a description of procedures for expeditious and timely acceptance of shipments containing more than 20 Curies of a radioactive source in special form. The application should also include provisions for the monitoring of packages for external radiation levels, maintaining records of

such surveys, and notifying the Department if surface radiation levels in excess of 200 millirem per hour or at three feet radiation levels in excess of 10 millirem per hour are found.

(p) Internal Inspection System or Other Management Control:

The application should include a description of the system for controlling the receipt, possession, and use of radioactive material. The system should assure that license conditions, Georgia regulations, and operating and emergency procedures are followed by radiography personnel.

(3)(c) of Rule 391-3-17-.03 requires that the license applicant submit a description of their internal inspection system or other management control.

This should include a description of (a) the qualifications of each person responsible for maintaining such control, (b) the type of internal inspections to be made and their frequency, (c) the responsibilities of each person in the program, (d) the procedure for recording and reporting deficiencies to appropriate management personnel, and (e) the education and follow-up program to be utilized in correcting deficiencies noted during inspections. The type and extent of the radiography program to be conducted will usually determine the nature of the system and the inspection frequency.

Periodic (at least quarterly) inspections of radiography operations should be made by a person of authority in management on both an announced and unannounced basis. This person should have a thorough knowledge of equipment, procedures and regulations, and level of competency at or above that expected of a radiographer instructor. Management should make a continuing review of quarterly inventories, utilization logs, and records of receipt and disposal of licensed material, personnel monitoring results, and surveys.

Item 11. WASTE MANAGEMENT

Because of the nature of the licensed material contained in devices, your only option for disposal is to transfer the material to an authorized recipient. Authorized recipients are the original supplier of the device, a commercial firm licensed by the Department, NRC or an Agreement State to accept radioactive waste from other persons, or another specific licensee authorized to possess the licensed material (i.e., whose license specifically authorizes the source and radiographic exposure device by manufacturers' names and model numbers or similar designation). No one else is authorized to receive and dispose of licensed material.

Before transferring radioactive material, you must verify that the recipient is properly authorized to receive it by using one of the methods described in 391-3-17-.02(19)(d). In addition, you must package and ship the material in accordance with the Departments and DOT regulations, and you must maintain records of the transfer as required by 391-3-17-.03(13)(i). It is acceptable to state in Item 11. of your "Application For Radioactive Materials License," Form, that "disposal of the radioactive material will be transfer to persons who is specifically licensed to receive and possess it."

Item 12. License Fees

The applicant should refer to the DNR Radioactive Materials License Fee Schedule (Appendix D) to determine the appropriate licensing fee and category. (Note that, in addition to licensing fees licensees are required to pay inspection fees and annual fees. No action will be taken on applications filed without

the proper fee.

Checks for the fees should be made payable to the **Department of Natural Resources, Radioactive Materials Program**, and mailed to the following address:

Radioactive Materials Fees
P.O. Box 101161
Atlanta, Georgia 30392

Note: Prior approval from the Department must be obtained before Small Entity classification can be used.

Mail license applications, amendment, renewal requests, and terminations of license to the following address:

Radioactive Materials Program
4244 International Parkway
Atlanta Tradeport, Suite 114
Atlanta, GA. 30354

Item 13. Certification

If you are an individual applicant acting in a private capacity, you must sign the completed application form. Otherwise, the application should be dated and signed by a representative of the applicant corporation or legal entity; the representative must be authorized to make binding commitments and to sign official documents on behalf of the applicant' and must certify that the application contains information that is true and correct to the best of the signer's knowledge and belief. Unsigned applications will not be reviewed and will be returned for proper signature.

IV. AMENDMENTS TO A LICENSE

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application and other correspondence with the Department (2) the terms and conditions of the license, and (3) the Department's regulations.

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

An application for a license amendment may be prepared either on the application form, Appendix A, or in a letter and should be submitted in duplicate as stated in Section 2 of this guide. Retain one copy because the license requires that you possess and use licensed material in accordance with the statements and representations in your amendment request and in any supplements to it.

Your application should state your license number and clearly describe the exact nature of the changes, additions, or deletions. References to previously submitted information and documents should be clear and specific and identify the pertinent information by date, page, and paragraph. For example, if you

wish to change the RSO, your application for a license amendment should specify the proposed RSO's name, training, and experience. The qualifications of the proposed RSO should be equivalent to those specified in Item 7 of this guide.

You need to include the appropriate fee for a license amendment with your application. The Department will not issue the amendment prior to receipt of the proper fee as specified in the Fee Schedule, Appendix D.

V. RENEWAL OF A LICENSE

Licenses are issued for a period of up to 5 years. Send an application for renewal, in duplicate, to the address specified in Section 2 of this guide. Retain one copy because the license requires that you possess and use licensed material in accordance with the statements and representations in your renewal request and in any supplements to it.

It is important that the appropriate fee, accompany your application for license renewal. The Department will not issue the license renewal prior to receipt of the fee.

You may submit an entirely new application for renewal as if it were an application for a new license without referring to previously submitted information. This is the preferred method of renewing a license, especially for those whose licenses reference a large number of documents or old documents. Submitting an entirely new application allows you to reevaluate your program periodically and consolidate the description of your program into one or two up to-date documents. A new application ensures that your program contains all needed information as requested in current licensing guidance.

As an alternative to a new application, you may:

1. Review your current license to determine whether the information about sealed sources and radiographic exposure devices/source changer devices accurately represents your current and anticipated program. Identify any necessary additions, deletions, or other changes and then prepare information appropriate for the required additions or changes.
2. Review the documents submitted to the Department in the past to determine whether the information is up to date and accurately represents your facilities, equipment, personnel, radiation safety procedures, locations of use, etc. The documents considered to represent your current program must be identified by date. Also identify any out-of-date and superseded documents and indicate the changes in them that are necessary to reflect your current program. Documents referenced in your license should not be older than 5 years unless all the information in the document accurately represents your current program. If you need to update information in documents 5 years old or older, you should submit a new application.
3. Review current Department regulations to ensure that any changes in the regulations are appropriately covered in your program description.
4. After you have completed your review, submit a letter to the Department in duplicate, with the proper fee, requesting renewal of your license and providing the information in items 1, 2, and 3, as necessary.

5. Include the name and telephone number of the person to be contacted about your renewal application and include a current mailing address if it is not indicated correctly on your license.

If you file your application for license renewal at least 30 days before the expiration date of your license and include the appropriate fee for license renewal, your present license will automatically remain in effect until the Department takes final action on your renewal application. However, if you file an application less than 30 days before the expiration date and the Department cannot process it before that date, you will be without a valid license when your license expires.

If you do not wish to renew your license, dispose of all licensed radioactive material possessed in a manner authorized by 391-3-17-.02(19). Complete the Department's form, "Request to Terminate Radioactive Materials License" (see Appendix B) and send it to the Department before the expiration date of your license with a request that your license be terminated.

If you cannot dispose of all the licensed radioactive material in your possession before the expiration date, you must request a license renewal for "storage only" of the radioactive material. The renewal is necessary to avoid violating the Department's regulations that do not allow possession of licensed material without a valid license.

VI. TERMINATION OF A LICENSE

You may request termination of your license at any time. This notification should include a request to terminate the license and must include a completed Department's form, "Request to Terminate Radioactive Materials License" (see Appendix B) , certifying that all sources have been disposed of properly. Note that a license is not terminated until the Department takes action to terminate the license. An application for license termination does not relieve the licensee from its obligations to comply with Department's regulations and the terms and conditions of the license.

**RADIOACTIVE MATERIALS PROGRAM
REQUEST TO TERMINATE RADIOACTIVE MATERIAL LICENSE**

1. Licensee _____ 2. License Number _____

3. Address _____ Zip Code _____

4. Request is hereby made that the Radioactive Material License described above be terminated for the following reason:

5. Radioactive Material possessed under this license has been disposed of as indicated below:

Material was used for the licensed purposes, none remains.

Material was leased, and has been returned to lessor.

Material has been transferred to the following licensee:

Name _____ License No. _____

Address _____ Zip Code _____

Material has been disposed of in the following manner:

6. Signature

(a) If Licensee is in name of Institution,

(b) If Licensee is in name of Individuals,

Responsible official must sign below

Radiation Safety Officer must sign below

Official

Radiation Safety Officer

Keep one copy for your records and send one copy to:

GEORGIA DEPARTMENT OF NATURAL RESOURCES
RADIOACTIVE MATERIALS PROGRAM
4244 INTERNATIONAL PARKWAY, SUITE 114
ATLANTA, GEORGIA 30354

APPENDIX B

CALIBRATION OF INSTRUMENTS

Calibration of survey meters should be performed with radionuclide sources ** that approximate point sources. The source activities should be traceable within $\pm 5\%$ accuracy to the National Institute of Standards and Technology (NIST).

Note: The small check source that is incorporated into some survey meters is not appropriate nor acceptable for calibration purposes.

1. The licensee shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this Rule and Rule 391-3-17-.03(7)(a)1 and 2. Instrumentation required herein shall have a range such that 2 milliroentgens per hour through one Roentgen per hour can be measured.
2. Each radiation survey instrument shall be calibrated:
 - (i) By a person licensed or certified by the Department, another Agreement State, or the U.S. Nuclear Regulatory Commission to perform such service;
 - (ii) At energies appropriate for the licensee's use;
 - (iii) At intervals not to exceed three months and after each instrument servicing;
 - (iv) To demonstrate an accuracy within ± 20 percent ; and
 - (v) At two points located approximately $1/3$ and $2/3$ of full-scale on each scale for linear scale instruments; at midrange of each decade, and at two points of at least one decade for logarithmic scale instruments; and at approximate points for digital instruments.
3. Records shall be maintained of these calibrations for two years after the calibration date for inspection by the Department.
4. Each radiation survey instrument shall be checked with a radiation source at the beginning of each day of use and at the beginning of each work shift to ensure the survey instrument is operating properly.

APPENDIX C

**Sources of cesium-137, or cobalt-60 are appropriate for use in calibrations. The activity of the calibration standard should be sufficient to calibrate the survey meters on all ranges up to one roentgen per hour. If there are higher ranges, they should at least be checked for operation and approximately correct response to radiation.

5. The inverse square law and radioactive decay law may be used for calibration. A calibrated source will have a calibration certificate giving its output at a given distance measured on a specified date by the manufacturer. The inverse square law may be used with any point source to calculate the exposure rate at other distances. The radioactive decay law may be used to calculate the output at any time after the specified source calibration date.

a. Inverse Square Law

If R_a is the exposure rate at a distance D_a from a point source and R_b is the exposure rate at a distance D_b from the same point source, then

$$R_a(D_a)^2 = R_b(D_b)^2$$

Note: R_a and R_b must be in the same units of exposure rate (e.g., mR/hour, R/hour, etc.) and D_a and D_b must be in the same units of distance (e.g., centimeters, meters, etc.).

If R_a , D_a , and D_b are known, R_b can be calculated from

$$\frac{R_a(D_a)^2}{(D_b)^2} = R_b$$

b. Radioactive Decay Law

The exposure rate (R_t) of a standard source at a time (t) after a specified calibration date is given by:

$$R_t = R_0 e^{-(\ln 2/T_{1/2})t}$$

where R_t is the exposure rate at a time t after the source calibration date R_0 is the exposure rate on the day of calibration t is the time elapsed since the calibration date

$T_{1/2}$ is the radionuclide half-life

Note: R_t and R_0 must be in the same units of exposure rate (e.g., mR/hour, R/hour, etc.) and t and $T_{1/2}$ must be in the same units of time (e.g., seconds, days, years, etc.).

APPENDIX C

DNR Radioactive Materials Licensee Fee Schedule

License Category	Licensing Fees				Inspection Fees		Annual Fees		
	Code	Application	Renewal	Amendment	Routine	Non-Routine	Nominal	Small Entity	Lower Tier
Medical Teletherapy	A.1	3,400	790	430	1,200	1,900	3,200	600	135
Institutional Medical-Mult. Use	A.2	710	1,000	430	1,000	1,500	1,200	600	135
Institutional Medical-Single Use	A.3								
Private Practice	A.4								
In-Vitro Studies Only	A.5	500	500	380	1,200	1,200	500	500	135
In-Vitro General Licenses	A.6	0	0	0	0	0	100	100	100
Bone Mineral Analyzers	A.7	710	1,000	430	1,000	1,500	1,200	600	135
Medical Manufacturer for Distribution	A.8.a.	3,400	1,400	460	1,400	1,900	2,900	600	135
Medical Distribution or Redistribution Only	A.8.b.	1,100	500	310	800	1,200	900	600	135
Mobile Nuclear Medicine	A.9	710	1,000	430	1,000	1,500	1,200	600	135
Broad Medical	A.10	2,300	2,000	360	1,600	1,800	3,300	600	135
Eye Applicators	A.11	710	1,000	430	1,000	1,500	1,200	600	135
Depleted Uranium	A.12	110	110	110	290	350	130	130	130
Special Nuclear Material(sealed sources in devices)	B.1	500	500	380	460	1,300	400	400	135
Special Nuclear Material(other)	B.2	690	690	230	690	800	1,000	600	135
Industrial Mfg. for Distribution	C.1	1,300	2,300	550	1,000	2,000	1,500	600	135
In-house Industrial Radiography	C.2	3,000	1,800	490	1,200	2,500	2,600	600	135
Multiple Job-Site Industrial Radiography	C.3								
Gamma Irradiators (Self-Shielded)	C.4.a.								
Gamma Irradiators (<10K Ci)	C.4.b.1.	1,000	750	250	500	1,000	1,000	600	135
Gamma Irradiators (>10K<100K Ci)	C.4.b.2.	5,000	3,750	1,250	1,200	2,400	5,000	600	135
Gamma Irradiators (>100K<1M Ci)	C.4.b.3.	10,000	7,500	2,500	2,500	5,000	10,000	600	135
Gamma Irradiators (>1M Ci)	C.4.b.4.	30,000	22,500	7,500	5,000	10,000	30,000	600	135
Broad Scope Distribution, Specific	C.5.a.	2,300	1,400	230	2,100	2,100	2,100	600	135
GL Distribution (source and/or device evaluation)	C.5.b.	2,500	580	390	690	690	1,700	600	135
GL Distribution (no source and/or device evaluation)	C.5.c.	1,900	940	290	690	690	1,400	600	135
NARM Exempt Distribution (device evaluation)	C.6.a.	2,100	1,100	250	690	690	1,500	600	135
NARM Exempt Distribution (no device evaluation)	C.6.b.	2,600	1,200	350	460	690	1,700	600	135
Well Logging/Tracers	C.7	3,400	2,000	540	800	800	2,300	600	135
Nuclear Laundries	C.8	1,400	1,400	350	1,200	1,900	1,600	600	135
Industrial Research & Development	C.9	1,100	1,100	630	800	930	1,300	600	135
Gas Chromatograph, Installed Gauges, etc.	C.10	500	500	380	1,200	1,200	500	500	135
Portable Moisture Density Gauges,Pb analyzers,etc.	C.11								
Calibration Sources	C.12								
Industrial (other)	C.13								
Broad Scope (Academic)	D.1	2,300	2,000	500	930	1,200	2,100	600	135
Broad Scope (Industrial R&D)	D.2								
Civil Defense	E.	580	400	310	690	690	500	500	135
Teletherapy Service Co.	F.	1,400	1,100	630	800	690	1,500	600	135
Consultants (Leak Testing Service)	G.	500	500	380	1,200	1,200	500	500	135
Storage Only	H.								
Academic (Non-Broad)	I.								
Device Evaluation	J.1	3,300	0	1,200	0	0	2,100	600	135
Source Evaluation	J.2	690	0	230	0	0	500	500	135
Reciprocity	K.	0	0	0	0	0	Appropriate License Renewal Fee		
Radioactive Waste Disposal-Burial	L.1	50,000	50,000	5,000	12,000	24,000	30,900	600	135
Radioactive Waste Disposal-Incineration	L.2								
Radioactive Waste-Storage,Packaging or Transfer	L.3								
G L Devices(except tritium safety signs)	GL	0	0	0	0	0	100	100	100

