



U.S. Environmental Protection Agency

Emergency Responder Health and Safety Manual

Chapter 2: Radiation Health and Safety Implementation Plan

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LIST OF ACRONYMS

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| ACL | Administrative Control Level |
| ALARA | As Low As Reasonably Achievable |
| ARL | Action Reference Level |
| ARST | Advanced Radiation Safety Training |
| BRST | Basic Radiation Safety Training |
| CFR | The Code of Federal Regulations |
| DOT | United States Department of Transportation |
| EPA | United States Environmental Protection Agency |
| ERT | Environmental Response Team |
| FRERP | Federal Radiological Emergency Response Plan |
| ID | Identification |
| mrem | Millirem |
| NRC | United States Nuclear Regulatory Commission |
| OSC | On-Scene Coordinator |
| OSHA | Occupational Safety and Health Administration |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| REM | Roentgen Equivalent Man |
| RERP | Radiological Emergency Response Plan |
| RPM | Remedial Project Manager |
| RSO | Radiation Safety Officer |
| SHEM | Safety, Health, and Environmental Management |
| SHEMD | Safety, Health, and Environmental Management Division |
| SHEMP | Safety, Health, and Environmental Management Program |
| SOP | Standard Operating Procedure |
| SRD | Self-reading dosimeter |
| TLD | Thermoluminescent dosimeter |
| XRF | X-ray fluorescence spectroscopy |

1.0 INTRODUCTION

In 2002, representatives from the U.S. Environmental Protection Agency (EPA) identified the need to develop a health and safety manual that specifically addresses the activities of EPA emergency response personnel. People in this group include EPA on-scene coordinators (OSCs)—a group that performs work in the field under both emergency and nonemergency scenarios—and members of EPA’s Environmental Response Team (ERT). In an effort to protect these workers, EPA is developing an Emergency Responder Health and Safety Manual, the objectives of which are to:

1. Give EPA emergency response personnel the tools they require to perform field work in a safe manner,
2. Promote a consistent approach to health and safety across the entire Agency so that emergency responders from different regions can be seamlessly interchanged, and
3. Equip EPA emergency response personnel with the tools they need to write site-specific Health and Safety Plans.

This *Radiation Health and Safety Implementation Plan* (hereinafter referred to as the Implementation Plan) serves as one of the “bricks” in the foundation of EPA’s Emergency Responder Health and Safety Manual. The Implementation Plan was developed by a Radiation Health and Safety Working Group established in November 2002 by the Superfund Removal Managers.

1.1 Scope and Purpose of the Document

EPA’s Safety, Health and Environmental Management Division (SHEMD) established guidelines for the Agency’s Radiation Health and Safety Protection Program in August 1996. These guidelines, which are summarized in the Safety, Health and Environmental Management (SHEM) Guidelines No. 38 (hereinafter SHEM Guide 38), outline the steps EPA should take to minimize the amount of ionizing radiation that Agency workers are exposed to on the job. Although SHEM Guide 38 established guidelines for a national program, there has been latitude with program implementation across the agency. The Implementation Plan will:

1. Provide nationally consistent, user-friendly guidance to agency management for implementing SHEM Guide 38 (and its associated updates).
2. Provide suggested approaches for radiation health and safety program areas that fall outside the domain of SHEM Guide 38. For example, the Implementation Plan discusses procedures for maintaining radiation-detection equipment, as well as steps to take to ensure that equipment with integral or attached radioactive sources is handled safely.

NOTE: Close coordination with the Regional Radiation Safety Officer (RSO) and Safety, Health and Environmental Management Program (SHEMP) Manager will be necessary to maximize the benefits of this Implementation Plan.

What this Implementation Plan does:

1. Provides complementary guidance for implementation of the requirements outlined in SHEM Guide 38, and

2. Outlines procedures to follow at the regional level to address radiation-related health and safety issues.

What this Implementation Plan does NOT do:

1. Replace or supersede, requirements imposed under SHEM Guide 38 or by licenses issued to EPA facilities by agreement states or by the U.S. Nuclear Regulatory Commission (NRC),
2. Address the development of a site-specific health and safety plan, or
3. Address onsite safety procedures.

1.2 Components of the Implementation Plan

This Implementation Plan outlines procedures that, if followed consistently across the agency, will ensure that radiation-related health and safety issues are adequately and consistently addressed throughout all EPA regions. This document lists EPA's minimum standards guidance and outlines the steps that should be taken to train emergency response personnel, implement personnel monitoring programs, address pregnant worker (embryo/fetus) concerns, maintain and use radiation-detection equipment, handle equipment that contains radioactive sources, promote proper recordkeeping practices, and develop an auditing/program evaluation process to examine whether a region has indeed met EPA's national minimum standards guidance.

1.3 Using the Implementation Plan

In an effort to promote consistency, this Implementation Plan assigns roles and responsibilities to specific EPA positions. At the same time, the authors acknowledge that a certain degree of flexibility is necessary in order for the Agency's radiation health and safety programs to be implemented successfully across EPA. Keeping flexibility in mind, the authors have included some features that allow users to customize the Implementation Plan to fit the needs of their specific region. For example, [Appendix A](#) presents a task chart that can be customized to show exactly who from a particular region is responsible for completing the activities identified in this Implementation Plan. In addition, the authors have left several spaces (highlighted in yellow) in the document. The intention is for users to fill in specific names or EPA position titles directly into the spaces. These blank spaces allow regions to designate responsibility, and also (once the blanks are filled) serve to create greater accountability for execution of the tasks. The first example of this fill-in-the-blank construction is presented in the following paragraph. (NOTE: In many cases, the authors provide suggestions about which position should be assigned to the blank space. It is up to the users, however, to make a final decision about who should perform the task and to document that decision clearly in the blank space. If users do not modify the information presented in the yellow-highlighted space, the recommendation offered by the authors will be considered acceptable.)

Each EPA region is expected to customize this Implementation Plan. To accomplish this, on a biannual basis, the **RSO/SHEMP Manager or another designated person** will call together the major stakeholders who are involved in implementing their region's radiation health and safety program and ask them to discuss the status of their program, to customize the task chart in [Appendix A](#), and to insert region-specific information in the blank spaces that appear throughout the document. Attendees should walk away from these meetings with a clear understanding of the role they are supposed to play in implementing their region's radiation health and safety program. The meetings should be attended by Removal Managers, RSOs, SHEMP Managers, emergency response personnel, and other key stakeholders.

The Implementation Plan is designed to be user-friendly and easy to navigate. Toward this end, hyperlinks have been incorporated throughout the text so that users can access detailed information on a particular topic by simply clicking on key words highlighted in blue. In addition, several ready-to-use tools are included in the document's appendices. For example, [Appendix B](#) presents a checklist that will help emergency responders gain a better understanding of their roles and responsibilities. A series of template letters and forms are also included in the document's other appendices.

2.0 BASIS OF IMPLEMENTATION PLAN

SHEM Guide 38 serves as the basis for this Implementation Plan. The following provides the legal authority for EPA's Radiation Health and Safety Protection Program: (1) Federal Radiation Protection Guidance for Occupational Exposure, 52 FR 2832, January 27, 1987; (2) EPA 1440.1, SHEMP; and (3) a Memorandum of Understanding signed between EPA's Office of Administration and Office of Radiation and Indoor Air. (The latter provides for joint initiation, maintenance, and oversight of the Agency's Radiation Health and Safety Protection Program.)

Other documents that served to shape the content of this Implementation Plan include:

- [10 CFR 20, "Standards for Protection Against Radiation," NRC.](#)
- [29 CFR 1910.1096, "Occupational Safety and Health Standards; Ionizing Radiation."](#)
- [NRC Guide 8.13, \(Current Version\), "Instruction Concerning Prenatal Radiation Exposure."](#)
- [Civil Rights Act of 1964, Title VII as amended \(regarding discrimination in employment\).](#)
- ["Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," EPA, 400-R-92-001, May 1992.](#)

3.0 NATIONAL MINIMUM STANDARDS

The Radiation Health and Safety Working Group has identified a set of minimum standards that should be met to achieve a basic level of standardization in radiation health and safety and ultimately EPA's response readiness across all the regions:

- Ensure that emergency response personnel participate in basic and advanced [radiation safety training](#) that follows the requirements listed in SHEM Guide 38.
- Ensure that emergency response personnel participate in a [personnel monitoring program](#), are thoroughly knowledgeable of this program's requirements, and understand the special monitoring procedures that must be taken to [protect pregnant workers and address embryo/fetus concerns](#).
- Ensure that emergency response personnel know how to [use and are aware of the maintenance and calibration requirements of the radiation-detection equipment at their disposal](#).
- Ensure that emergency response personnel know how to [use equipment that contains radioactive sources in a safe manner](#).

- Ensure annual [audits](#) are performed to determine whether the abovementioned national minimum standards have been met.

It is anticipated that each region might adopt additional procedures as needed to ensure effective training, documentation, and preparedness. It is assumed that EPA's Removal Managers will be held accountable for ensuring these national minimum standards are met and maintained.

4.0 ROLES AND RESPONSIBILITIES

Extensive coordination is required to implement a successful radiation health and safety program that protects emergency response personnel from unnecessary exposures to ionizing radiation. Within each region, key personnel will be assigned a specific set of responsibilities to accomplish this goal. This section outlines the roles and responsibilities (as they relate to radiation safety) of the personnel who are tasked with ensuring that the national minimum standards are met. The roles and responsibilities of the titles listed below reflect the requirements of the plan; however, while some roles are inherent to a position, some roles and responsibilities may be shifted based on regional human resource and title delineations. As noted in Section 1.3, the Implementation Plan's authors have incorporated some features to allow each region to customize the Plan to fit its needs. For example, the task chart in [Appendix A](#) and the blank spaces (highlighted in yellow) that appear throughout the document allow users to assign responsibilities for specific tasks to specific people (or position titles). This flexibility is designed to allow for the best use of regional resources; however it should not be interpreted as allowing regions to remain vague about the personnel responsible for performing the various tasks. It is vital that a name be assigned to a task regardless of title disparities between regions. In addition, personnel who are assigned responsibilities must be involved in the "fill in the blank" discussions. This will ensure that all personnel know what their responsibilities are and what their supervisors expect as a measure of success. Personnel who are not specifically listed in Section 4.0 of this document might also play a role in executing regional radiation health and safety programs. Users should feel free to list these personnel in the task chart in [Appendix A](#) and to fill their names (or position titles) into the blank spaces that appear throughout the document. For example, if a region uses a warehouse contract to calibrate their radiation-detection instrumentation, the project officer for the contract might be listed as the person responsible for calibrating equipment.

Key personnel who will play a role in implementing regional radiation health and safety programs include:

- *[The Removal Manager](#)*. The Removal Manager is responsible for the health and safety of all personnel who work within his or her section or branch. Removal Managers must make sure that the procedures outlined in this Implementation Plan are followed by the responsible parties. Toward this end, Removal Managers must communicate frequently with those who are responsible for radiation health and safety on a day-to-day basis, such as the RSO and SHEMP Manager. Removal Managers must place strong emphasis on protecting EPA emergency response personnel by supporting programs established by the RSO or SHEMP Manager, and by demonstrating in their attitude that they promote all components of a strong workplace safety program. They must authorize the use of budgetary and human resources for training, equipment maintenance, and storage. In addition, they must appoint a person to serve as the regional Health and Safety Program Contact. ([Appendix C](#) includes a template appointment letter.)
- *[The RSO/SHEMP Manager](#)*. The RSO is the primary person responsible for radiation safety for an EPA region. The SHEMP Manager is the primary person responsible for overall worker health and safety for an EPA region. In many regions, both of these positions play a role in administering regional radiation health and safety programs. The specific duties that fall upon each position may vary from region to

region. For example, in some regions, the RSO might take on a task that a SHEMP Manager performs in another region, and vice versa.

NOTE: This document uses the phrase *RSO/SHEMP Manager* to denote certain functional roles and responsibilities that must be accomplished to implement a regional radiation health and safety program. To allow for regional flexibility, these roles have not been specifically designated to either the regional RSO or the SHEMP Manager. When customizing the Implementation Plan, however, users should determine exactly how the tasks will be divided between these two positions. It is expected that in the discussions preceding implementation of the program, stakeholders will agree upon who should be held accountable for fulfilling specific responsibilities.

- *The Health and Safety Program Contact.* The Health and Safety Program Contact—presumed to be an OSC with special collateral duties—serves as the Health and Safety primary point of contact for a region’s emergency response program. This person serves as the contact for ALL health and safety issues, including emergency response radiation issues. He or she facilitates and/or coordinates the communication between the managers who administer radiation safety programs and the emergency response personnel who are subjected to the programs. As such, the Health and Safety Program Contact serves as a liaison between the Removal Manager, the RSO, and SHEMP Manager, and emergency response personnel. In addition, the Health and Safety Program Contact may coordinate with and serve as a liaison to the RSO for radiation-related training and equipment maintenance.
- *Emergency response personnel.* OSCs and other EPA personnel who perform field work or respond to emergency situations are responsible for attending/completing safety training and following onsite safety requirements. Removal Managers, RSOs, and SHEMP Managers ensure that workers have the appropriate knowledge and tools to protect themselves. It is the responsibility of the individual worker to retain their emergency response readiness proficiency. Emergency response personnel must also ensure the safety of all onsite personnel working in the field.

Table 1 provides an overview of the tasks that the abovementioned positions are expected to perform in an effort to implement radiation health and safety programs in their regions. (NOTE: These tasks reflect the generic default position responsibilities, but the Plan allows for flexibility in shifting responsibilities to other personnel, as necessary.) A more detailed task chart is included in Appendix A.

TABLE 1:
ROLES AND RESPONSIBILITIES—IMPLEMENTING THE RADIATION HEALTH AND SAFETY PROGRAM

| Activities | EPA Positions | | | |
|----------------------------------|--|---|---|---|
| | Removal Manager | RSO/SHEMP Manager | Health and Safety Program Contact | EPA Emergency Response Personnel (e.g., OSCs and other emergency responders) |
| General responsibilities | <ul style="list-style-type: none"> ■ Ensure the overall health and safety of all personnel within the section or branch. ■ Delegate a Health and Safety Program Contact who will serve as a point of contact on emergency response radiation issues. ■ Prevent workers who are not in full compliance with radiation-safety requirements from performing field work or emergency response activities. | Develop and operate a radiation health and safety program that ensures compliance with all NRC or applicable agreement state radioactive materials license conditions. | Serve as the regional point of contact on radiation-safety issues for emergency response personnel. | Ensure the safety of all onsite personnel working in the field. |
| Radiation safety training | <ul style="list-style-type: none"> ■ Allot time and travel money for emergency response personnel to receive required radiation-safety training. ■ Restrict field work and emergency response activities if an individual fails to meet his or her training requirements. ■ Help workers obtain training waivers if necessary and appropriate. | <ul style="list-style-type: none"> ■ Work with the Health and Safety Program Contact to develop/organize the radiation safety training program. ■ Provide training for EPA emergency response personnel, and administer tests for Basic Radiation Safety Training, Advanced Radiation Safety Training, and refresher courses. Provide remedial training and re-testing if necessary. ■ Track training requirements and provide written certification of training completion. (Send notifications of course completion to workers, Health and Safety Program Contacts, and Removal Managers.) ■ Issue training waivers if appropriate and maintain a record of the waiver. | <ul style="list-style-type: none"> ■ Coordinate with the RSO/SHEMP Manager to ensure regular delivery of Basic and Advanced Radiation Safety Training and refresher courses and ensure that training opportunities are made available to emergency response personnel. ■ Coordinate with the RSO/SHEMP Manager to track training requirements to determine who has (or has not) completed the required courses. | <ul style="list-style-type: none"> ■ Attend and pass the Basic Radiation Safety course ■ Attend and pass an Advanced Radiation Safety course. ■ Attend radiation safety refresher courses at least once every 2 years and pass associated examinations. ■ Maintain records. (Each worker must make sure that his or her training and medical monitoring documentation is readily available.) ■ Seek training waivers if necessary and appropriate. |

| Activities | EPA Positions | | | |
|----------------------|--|---|--|---|
| | Removal Manager | RSO/SHEMP Manager | Health and Safety Program Contact | EPA Emergency Response Personnel (e.g., OSCs and other emergency responders) |
| Personnel monitoring | <ul style="list-style-type: none"> ■ Make sure emergency response personnel are enrolled in the personnel monitoring program. ■ Coordinate with the RSO/SHEMP Manager to discuss and respond to situations in which a worker has received (or plans to receive) a dose that exceeds administrative limits. ■ Address pregnancy-related issues: communicate with workers who have declared pregnancy to make sure they take additional safety measures. ■ Support recordkeeping efforts by identifying dates for employees to submit <i>Exposure, Injury, and Dosimetry Tracking Forms</i>. | <ul style="list-style-type: none"> ■ Enroll workers into the personnel monitoring program. (Maintain a list of enrollees and determine whether baseline bioassays are needed.) ■ Administer the thermoluminescent dosimeter (TLD) program: <ul style="list-style-type: none"> ▸ Provide TLD training. ▸ Oversee usage and storage of TLD badges. (Identify storage locations and determine the frequency of TLD exchange.) ▸ Address broken, lost, or contaminated TLD badges. (Document loss, issue new badge, and assign administrative dose.) ■ Issue special dosimeters. ■ Administer the self-reading dosimeter (SRD) program. ■ Coordinate with the Removal Manager to discuss and respond to situations in which a worker has received (or plans to receive) a dose that exceeds administrative limits. ■ Address pregnancy-related issues: <ul style="list-style-type: none"> ▸ Inform workers about potential risks associated with prenatal radiation exposure. ▸ Administer protective measures (e.g., issue an additional TLD badge) to ensure the safety of the unborn child. ■ Help plan internal exposure monitoring if necessary. ■ Adhere to recordkeeping and notification requirements. | <ul style="list-style-type: none"> ■ Maintain a list, coordinated with the RSO/SHEMP Manager, of those enrolled in the personnel monitoring program. ■ Designate locations for TLD badge storage. ■ Maintain SRD devices. (Perform routine cleaning and battery replacement.) | <ul style="list-style-type: none"> ■ Complete enrollment forms for the personnel monitoring program. ■ Participate in TLD training. ■ Use and store TLD badges appropriately. (For example, return the TLD at the end of the wear period.) ■ Inform the RSO/SHEMP Manager of any broken, lost, or contaminated TLD badges. ■ Participate in the SRD training program. ■ Coordinate with the Removal Manager and RSO/SHEMP Manager to discuss situations that involve exposure to doses exceeding administrative levels. ■ Choose whether to address pregnancy-related issues: <ul style="list-style-type: none"> ▸ Be aware of the policies concerning declaration of pregnancy. ▸ If pregnancy is declared, coordinate with managers to address safety issues. ■ Coordinate with managers to plan any necessary internal exposure monitoring. ■ Adhere to recordkeeping and notification requirements. (For example, complete and maintain the <i>Exposure, Injury, and Dosimetry Tracking Form</i>, and report known occupational exposures to managers.) |

| Activities | EPA Positions | | | |
|--|---|---|--|--|
| | Removal Manager | RSO/SHEMP Manager | Health and Safety Program Contact | EPA Emergency Response Personnel (e.g., OSCs and other emergency responders) |
| Using and maintaining radiation-detection equipment | Check in regularly with the RSO/SHEMP Manager, the Health and Safety Program Contact, and any other responsible parties to ensure that the region's radiation-detection equipment is calibrated, stored, and maintained properly. | Provide training on radiation detection equipment usage and maintenance procedures. | <ul style="list-style-type: none"> ■ Ensure that emergency response personnel receive training on radiation detection equipment usage and maintenance procedures. ■ Ensure maintenance and calibration of radiation detection equipment is tracked. | Attend training on radiation detection equipment usage and maintenance requirements to retain an appropriate readiness level of expertise with the equipment assigned to the region. |
| Using equipment that contains radioactive sources | Check in regularly with the RSO/SHEMP Manager, the Health and Safety Program Contact, and any other responsible parties to ensure that equipment that contains radioactive sources is used, maintained, and transported safely. | <p>Ensure the safe use of equipment that contains radioactive sources by playing a role in the following activities:</p> <ul style="list-style-type: none"> ■ Coordinating any applicable regional NRC audits. ■ Purchasing equipment and making sure each procurement request includes a disposal plan. ■ Securing, storing, shipping, and disposing radioactive materials under NRC license. ■ Ensuring that leak/wipe tests are performed on sealed sources. ■ Coordinating with emergency response personnel to ensure the proper transportation of equipment. | <p>Ensure the safe use of equipment that contains radioactive sources by playing a role in the following activities:</p> <ul style="list-style-type: none"> ■ Inventorying regional equipment that contains radioactive sources. ■ Assisting and coordinating with the RSO/SHEMP Manager in: (1) purchasing and disposing equipment, (2) performing periodic leak/wipe testing, and (3) maintaining equipment. | <p>Oversee the safe use of equipment that contains radioactive sources by:</p> <ul style="list-style-type: none"> ■ Ensuring that equipment that contains a radioactive source is properly stored and maintained while on site. ■ Coordinating with RSO/SHEMP Manager when transporting equipment containing a radioactive source. ■ Complying with all regulations, standards, licensing conditions, guidelines, policies, and procedures pertaining to the acquisition, use, and disposal of radioactive materials. |
| Audits/program evaluations | <ul style="list-style-type: none"> ■ Assist the RSO/SHEMP Manager with internal program evaluation and auditing efforts. ■ Upon request, provide appropriate information to Core ER program evaluation teams. ■ Take action to address any program deficiencies that are identified. | <ul style="list-style-type: none"> ■ Fill out the <i>Radiation Health and Safety Program Audit Form</i> annually and keep copies of this form on file. ■ Evaluate program performance. ■ Take action to identify any program deficiencies that are identified. ■ Upon request, provide appropriate information to Core ER program evaluation teams. | <ul style="list-style-type: none"> ■ Assist the RSO/SHEMP Manager with internal program evaluation and auditing efforts. ■ Upon request, provide appropriate information to Core ER program evaluation teams. | <ul style="list-style-type: none"> ■ Assist the RSO/SHEMP Manager with internal program evaluation and auditing efforts. ■ Upon request, provide appropriate information to Core ER program evaluation teams. |

5.0 RADIATION SAFETY TRAINING

Training is a key element of a radiation health and safety program. Workers should know what they need to do to protect themselves from ionizing radiation. This section describes the type of training that EPA's emergency response personnel must take and pass, the records that must be kept, and the process involved with obtaining training waivers.

5.1 Training Requirements

EPA emergency response personnel are required to take several types of radiation safety training. The Removal Manager must allot time, and if necessary travel funds, for workers to obtain this training. The RSO, SHEMP Manager, and the Health and Safety Program Contact will work together to develop, organize and coordinate as necessary to provide a training program and ensure that the training is available to all emergency response personnel. The training requirements listed below describe the national minimum standards that must be met across the Agency.

5.1.1 Basic Radiation Safety Training Courses

Basic Radiation Safety Training (BRST) is designed for workers who have little or no prior knowledge of radiation effects or radiation safety principles. As SHEMP Guide 38 states, the training must at least provide a fundamental understanding of:

- The nature of ionizing radiation.
- The biological effects of ionizing radiation.
- Protective measures that can be taken to minimize exposure to ionizing radiation.
- The contents of [NRC Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure."](#)
- The elements of EPA's Radiation Safety and Health Protection Program.

How Long Does the Agency Have To Implement the Training Requirements?

The training requirements will be phased in for EPA emergency response personnel who have not yet met the advanced radiation safety training requirement, and in those regions where examinations have not previously been formally graded. All emergency response personnel will be expected, however, to meet all applicable training requirements no later than 1 year from the adoption of this *Radiation Health and*

BRST will be provided to each worker before, or at the time of, his or her enrollment into the personnel monitoring program. **The RSO/SHEMP Manager or another designated person** will provide basic training to all incoming emergency response personnel. The training requirement can be met either by: (1) requiring workers to complete EPA's BRST course (available on CD-ROM SHEMD Disk #3, Radiation Protection Training), or (2) by offering region-specific training. Regardless of which training method is used, all emergency response personnel will be required to complete an EPA BRST test that has been developed and/or approved by **the RSO/SHEMP Manager or another designated person**, and attain a score of 80 percent or higher to demonstrate adequate proficiency in the subject matter. If a worker fails to attain a score of 80 percent on the BRST exam, the worker can still obtain a certificate if he or she meets with **the RSO/SHEMP Manager or another designated person** to review the test questions and verbally demonstrates an adequate understanding of the course material.

Emergency response personnel are allowed to take BRST courses from sources other than those provided by their regional managers to fulfill their training requirements. If this option is chosen, upon completion of the course, the worker must notify **the RSO/SHEMP Manager or another designated person**, who will in turn administer the required examination.

5.1.2 Advanced Radiation Safety Training Courses

Advanced radiation safety training (ARST) is designed to teach personnel about:

- Procedures and techniques that have been established for using radiation-detection equipment to conduct radiation surveys safely. (“Hands-on” familiarization with survey equipment and materials is included in the training.)
- Procedures for securing expert radiation safety or health physics assistance.
- Work practices and supervisory techniques that can be used to ensure worker exposure is As Low As Reasonably Achievable (ALARA).
- Procedures for allowing exposures that may exceed the Administrative Control Level of 500 mrem per year. (See 6.2.4.3 [Special Circumstances—Planned Special Exposures and Emergency Operations] of the document for more information.)

SHEM Guide 38 indicates that ARST, or possession of a combination of education, training, and experience which provides the equivalent, should be considered mandatory for workers in the following categories:

- Those who routinely engage in, or expect to routinely engage in, work assignments in the field where the potential for exposure to ionizing radiation exists.
- Those who engage in emergency response activities where the potential for exposure to ionizing radiation exists.
- Those who are responsible for recognizing the need for, and requesting, expert radiation safety or health physics support in laboratory or field settings.
- Immediate supervisors of field workers who routinely engage in work assignments where the potential for exposure to ionizing radiation exists.

EPA emergency response personnel fall into several of the abovementioned categories, and therefore, are expected to obtain advanced level training prior to:

1. Entering into an emergency response situation in which ionizing radiation might be encountered, or
2. Managing a removal site where the potential for the presence of ionizing radiation exists.

The RSO/SHEMP Manager or another designated person will offer an ARST course in each region at least once per year or, as an alternative, will give the Removal Manager a list of courses that meet the ARST course requirements. **The RSO/SHEMP Manager or another designated person** will administer an examination to emergency response personnel at the end of the course (whether the course is provided in the region or elsewhere) to ensure comprehension of concepts in accordance with the advanced training requirements. The successful completion of an examination shall be demonstrated by the student

attaining a score of 80 percent or higher. If a worker fails to attain a score of 80 percent on the ARST exam, the worker can still obtain a certificate if he or she meets with **the RSO/SHEMP Manager or another designated person** to review the test questions and verbally demonstrates an adequate understanding of the course material.

Emergency response personnel are allowed to take ARST courses from sources other than those provided by their regional managers to fulfill their training requirements. If this option is chosen, the worker must notify **the RSO/SHEMP Manager or another designated person** and he or she will decide whether this training fulfills the requirements of ARST. If so, the ARST exam will be administered upon completion of the course.

5.1.3 Refresher Courses

Periodically, **the RSO/SHEMP Manager or another designated person** will provide refresher radiation health and safety training. As indicated in SHEM Guide 38, emergency response workers are responsible for ensuring that they attend the refresher training once every 2 years. They must attain a score of 80 percent or higher on the associated examination.

5.1.4 Other Training Requirements

The basic, advanced, and refresher training courses described above are specifically called out as requirements in SHEM Guide 38. EPA emergency response personnel also need training on how to use personnel monitoring devices and radiation-detection instrumentation. This training is discussed later in this document, under the following sections:

- **TLD Badge Training—An Introduction to General TLD Guidelines** (Section 6.2.1.1).
- **Training on Radiation Detection Instrumentation** (Section 7.1).

It should be noted that these training courses can (and often are) incorporated as specific modules in the BRST or ARST courses. Since **the RSO/SHEMP Manager or another designated person** is responsible for providing these additional training modules, it is up to his/her discretion whether or not to combine either the TLD badge or radiation-detection equipment modules with the BRST or ARST courses.

5.2 Maintaining Training Records and Tracking Training Requirements

When a worker completes a training course, **the RSO/SHEMP Manager or another designated person** will provide written certification to the worker, the Removal Manager, and the Health and Safety Program Contact. ([Appendix D](#) provides an example of a training certification letter.)

_____ will maintain the training documentation for all of the region's emergency response personnel in a permanent repository that is accessible to the Removal Manager, the RSO, SHEMP Manager, the Health and Safety Program Contact, and emergency response personnel. However, each individual emergency responder will be responsible for:

1. Maintaining certification that all of his or her training and medical monitoring is current, and
2. Ensuring that this documentation is available during response activities.

The Health and Safety Program Contact and **the RSO/SHEMP Manager or another designated person** will monitor and track who has (or has not) met the training requirements. **The RSO/SHEMP Manager or another designated person** will notify emergency response personnel and the Removal Manager when required training is needed or available. The Removal Manager is responsible for making sure that emergency response and field work activities are restricted for workers who have failed to meet the training requirements.

5.3 Obtaining Training Waivers

In the event of activation of either the *Federal Radiological Emergency Response Plan (FRERP)* or the *EPA Radiological Emergency Response Plan (EPA-RERP)*, incident-specific special waivers of formal SHEM Guide 38 training requirements may be granted.

If a radiological emergency occurs that requires a response from workers who have not yet completed both the basic and advanced courses, it is possible to obtain a training waiver. In such a circumstance, emergency response personnel and the Removal Manager should contact **the RSO/SHEMP Manager or another designated person**, who will in turn assess the worker's ability to perform the work and determine whether it is acceptable to issue a training waiver. If **the RSO/SHEMP Manager or another designated person** decides that a waiver is warranted, he or she will issue the waiver, provide the appropriate documentation to the Removal Manager (see [Appendix E](#)), and maintain a record of the training waiver.

6.0 PERSONNEL MONITORING

Personnel monitoring programs are used to track and record occupational exposures to radiation. The goal of a personnel monitoring program is two-fold:

1. Provide information about an individual's exposure profile, and
2. Limit his or her radiation exposure to EPA's radiation dose limits.

EPA's dose limitation system is based on three principles:

1. **Justification:** there should not be any planned occupational exposure of workers to ionizing radiation without the expectation of an overall benefit from the activity that causes the exposure.
2. **Optimization:** a sustained effort should be made to ensure that collective doses, as well as annual, committed, and cumulative lifetime individual doses, are kept ALARA.
3. **Limitation:** radiation doses received as a result of routine and/or emergency occupational exposure should not exceed the Administrative Control Level that has been established under EPA's Radiation Safety and Health Protection Program.

This section describes the steps that should be taken to implement a personnel monitoring program. Details are provided about thermoluminescent dosimeters (TLDs), self-reading dosimeters (SRDs), and procedures to follow for special conditions such as when an employee has declared she is pregnant or if an employee's monitoring device reveals higher-than-acceptable exposure levels. This section also discusses internal exposure monitoring and describes when this kind of monitoring is warranted. In addition, recordkeeping and notification requirements for the personnel monitoring program are also discussed.

6.1 Enrollment in the Personnel Monitoring Program

All EPA workers who are expected to perform emergency response or field work activities will be enrolled in a personnel monitoring program. Upon hiring a new OSC (or another type of emergency responder), the Removal Manager should identify the incoming worker to **the RSO/SHEMP Manager or another designated person**, who will in turn ask the worker to fill out an enrollment form (see [Appendix F](#) for a sample form), collect the completed form from the worker, maintain a list of employees who are enrolled in the personnel monitoring program, and distribute the list to the Health and Safety Program Contact.

At the time of enrollment, **the RSO/SHEMP Manager or another designated person** will ask the worker to provide prior employer information and to indicate whether previous employers collected radiation dosimetry data on him or her. If such data exist, the worker will be asked to sign a release for his or her previous exposure records. (A sample release form is provided in [Appendix F](#).)

As part of enrollment, EPA emergency response personnel are eligible for baseline bioassays. **The RSO/SHEMP Manager or another designated person** shall determine which enrollees need initial baseline radionuclide-specific analysis. Any enrollee who receives a baseline radionuclide-specific analysis at any point during his or her participation in EPA's personnel monitoring program will also receive a similar analysis upon exiting the program. The exit bioassay will include an assessment of any of the long-half-life radionuclides that a worker might have been exposed to, in addition to select radionuclides included in the initial or subsequent bioassays. The **RSO/SHEMP Manager or another designated person** will determine whether an exit bioassay is necessary.

6.2 External Exposure Monitoring— Requirements and Implementation Steps

6.2.1 Thermoluminescent Dosimeter (TLD) Program

The TLD badge is the standard device used for personnel monitoring. EPA workers wear TLD badges when working in the field. TLDs are used to measure whole-body radiation exposure. They can measure the shallow and penetrating components of ionizing radiation. The standard TLD issued to EPA workers, however, is limited to recording exposures resulting from gamma, x-ray, and some beta radiation. The badges do not provide real-time data on exposure levels. To determine how much radiation the worker has been exposed to, the worker must exchange his or her badge for a new one on a regular basis and have the old badge analyzed. The readings collected from the exchanged badge are recorded, then used to determine whether the worker needs to alter his or her activities to reduce radiation exposures.

6.2.1.1 TLD Badge Training—An Introduction To General TLD Guidelines

The RSO/SHEMP Manager or another designated person will provide training on TLD badges to EPA emergency response personnel and will maintain a log documenting who has received this training. At a minimum, the training will provide the following information on general TLD guidelines:

- TLDs should be worn at all oil and hazardous waste sites and all sites where there is a potential for exposure to ionizing radiation.
- TLDs should be worn outside personal protection clothing, between the neck and waist.

- TLDs should be stored in a low-radiation area and in locations where the badges will not be exposed to elevated temperatures, light, or moisture.
- TLDs should never be deliberately exposed to radiation or exposed to non-occupational sources of radiation. For example, TLDs should not be exposed to airport x-rays.
- **The RSO/SHEMP Manager or another designated person** should be notified if the TLD has been exposed to non-occupational sources of radiation, or if the TLD has been lost or damaged. He or she should also be notified if occupational exposure is suspected.
- Because each TLD badge records a specific individual's occupational exposure, the badges should not be shared or worn by people to whom they have not been assigned.
- The TLD should be returned at the end of the monitoring period to ensure prompt analysis.

6.2.1.2 Usage, Exchange, and Storage Requirements for TLD Badges

If EPA has issued a dosimeter to a worker, that worker is required to wear the dosimeter whenever he or she is working in an EPA work area that has a potential for radiation exposure that exceeds normal background levels. EPA-issued dosimeters must only be worn during EPA business. If another agency or organization has also issued a dosimeter to the worker, that dosimeter should be worn (as required) in addition to the EPA-issued dosimeter.

Unless otherwise specified (for example, see [Section 6.2.5 \[Monitoring Pregnant Workers and Addressing Concerns About the Embryo/Fetus\]](#)), TLDs will be exchanged (and their results reported) on a calendar-quarterly basis. However, **the RSO/SHEMP Manager or another designated person** might decide to increase the frequency of the exchange. Such an increase would be warranted, for example, if a particular site had areas that had the potential to cause elevated exposure levels.

When not in use, dosimeters must be appropriately stored to prevent damage and inadvertent exposure. **The RSO/SHEMP Manager or another designated person** and the Health and Safety Program Contact will identify storage locations for badges that are not in use. EPA workers will place their TLDs in the designated storage location when not on work status.

6.2.1.3 Broken, Lost, or Contaminated TLDs

All TLD readings become a part of the wearer's permanent exposure record. It is important to make sure the TLDs are exchanged (and their results recorded) on a regular basis. EPA workers must notify **the RSO/SHEMP Manager or another designated person** immediately if their TLD has been exposed to non-occupational radiation sources or if the worker suspects that the TLD has been lost, damaged, or compromised. Under such circumstances, **the RSO/SHEMP Manager or another designated person** will document the loss (or damage) and arrange for a replacement TLD to be issued. **The RSO/SHEMP Manager or another designated person** will also decide, based on a follow-up investigation, whether an exposure dose should be estimated and recorded for the time period for which the TLD badge was lost, damaged, or compromised. During the investigation, **the RSO/SHEMP Manager or another designated person** will gather the information necessary to determine or reconstruct any and all possible exposure scenarios. In some cases, the wearer might be assigned an exposure dose equal to EPA's maximum allowable radiation dose limits for the quarter. (NOTE: At times the TLD vendor will automatically report EPA's maximum allowable radiation dose for any TLD that is not returned to them by the end of the designated monitoring period, as required by their procedures.)

No assigned dose may be removed from the employee's exposure record except at the discretion and approval of **the RSO/SHEMP Manager or another designated person**.

6.2.2 Issuing Special Dosimeters

If EPA emergency response personnel are working at a site where radiation is a known hazard, they must report any potential or suspected exposure to **the RSO/SHEMP Manager or another designated person**. At some work sites, additional special dosimeters might be required. For example, extremity TLD dosimeters (ring, wrist), neutron dosimeters, or alpha dosimeters might be deemed necessary. If this equipment is needed, the RSO/SHEMP Manager or **the RSO/SHEMP Manager or another designated person** will work with emergency response personnel and their supervisors to ensure that these exposure monitoring tools are available either through **the RSO/SHEMP Manager or another designated person** or through an outside vendor that has been contracted by the Superfund program.

6.2.3 Self-Reading Dosimetry (SRD) Program

SRD devices provide real-time data on radiation exposure levels. There are two types of SRDs: electronic and passive. SRDs are used:

1. To determine whether unanticipated radiological hazards are present,
2. To assist in the completion of an exposure investigation, and
3. To help ensure that EPA workers' exposure doses are ALARA.

In addition, SRDs can be used to corroborate legal TLD exposure records. The SRD program will be administered as an extension of the TLD Program.

SRDs will be worn under the direction of **the RSO/SHEMP Manager or another designated person**, who will distribute SRDs to EPA emergency personnel who have:

1. Enrolled in the TLD program, and
2. Received a passing grade on the BRST Exam.

Specific SRDs will be uniquely assigned to specific users. (This is to facilitate cross referencing and to verify exposure levels recorded by the specific users' TLD.) Distribution and assignment records will be maintained by **the RSO/SHEMP Manager or another designated person**, and copies will be sent to the Health and Safety Program Contact.

SRDs will be distributed with an Exposure Record Card (see [Appendix G](#) for a sample card). **The RSO/SHEMP Manager or another designated person** will brief emergency response personnel on the Exposure Record Card and corresponding recordkeeping procedure. The Exposure Record Card will record the serial number of the SRD, the beginning and end of shift dose values, and a calculated shift exposure. If the calculated shift dose is greater than 50 mrem (EPA's Action Reference Level), or if the whole body H(10) alarm sounds, the worker will notify **the RSO/SHEMP Manager or another designated person**. Exposure Record Cards will then be turned into **the RSO/SHEMP Manager or another designated person** for review at the end of each incident response, or at least quarterly.

Damaged SRDs will be turned in to **the RSO/SHEMP Manager or another designated person** for maintenance. Routine cleaning and battery replacements will be handled by the Health and Safety Program Contact. Maintenance records will be sent to **the RSO/SHEMP Manager or another designated person**.

Electronic SRDs will be calibrated by the manufacturer on a staggered annual schedule. **The RSO/SHEMP Manager or another designated person** will collect and redistribute the SRDs and will ensure that SRDs are zeroed or re-zeroed at the start of each incident.

Dose alarms will be set by **the RSO/SHEMP Manager or another designated person**. The H(10), whole body, dose alarm will be set at 50 mrem. The H(10), whole body, dose rate alarm will be set to 1 mrem/hour. Any changes to the alarms must be approved by **the RSO/SHEMP Manager or another designated person**.

6.2.4 Responding to the Dosimetry Data—Addressing Dose Limits

As noted above, personnel monitoring programs are used to ensure that employees are not exposed to unnecessary amounts of ionizing radiation. EPA has established thresholds to help the Agency determine when it is necessary to take action to protect its employees. For example, the Agency has established an:

- *Action Reference Level (ARL)*. This value serves as a trigger level that is designed to ensure that a worker's radiation dose does not exceed the annual dose limit. (EPA has established an ARL of 50 mrem/quarter whole-body dose from external exposure or internal effective dose equivalent.)
- *Administrative Control Level (ACL)*. This value represents the maximum acceptable dose for an individual EPA worker during a period of 12 consecutive calendar months. (EPA has established an ACL of 500 mrem total effective dose equivalent.)

6.2.4.1 Exceeding the ARL

If an EPA worker's dosimeter returns a value greater than the ARL of 50 mrem/quarter, his or her exposure situation should be assessed. The dosimetry service provider will notify **the RSO/SHEMP Manager or another designated person** of the exceedence by telephone, who will in turn notify the worker and his or her Removal Manager. The **the RSO/SHEMP Manager or another designated person**, in collaboration with the worker and the Removal Manager, will perform a review of the circumstances that led to the exceedence of the ARL. No further action will be required if the worker and the Removal Manager are satisfied that appropriate protective measures have been put in place to address the situation. If the source of the worker's exposure is unknown, however, **the RSO/SHEMP Manager or another designated person** may recommend performing additional exposure monitoring or modifying the worker's operating practices until the source is identified.

6.2.4.2 Exceeding the ACL

If an EPA worker's dosimeter returns a value greater than the ACL, then the quarterly or annual dose limits have been reached or exceeded and the worker's exposure situation should be assessed. **The RSO/SHEMP Manager or another designated person**, in collaboration with the worker and the Removal Manager will perform a review of the circumstances that led to the exceedence of the ACL. Any worker who reaches the ACL should be temporarily restricted from working on assignments that would expose him or her to additional radiation. (As noted below, this practice can be waived under special circumstances.) Managers and supervisors shall not discriminate in employment practices—including hiring; discharge; compensation;

and terms, conditions, or privileges of employment—should a worker incur temporary work restrictions due to occupational radiation exposure equal to, or greater than, the ACL.

6.2.4.3 Special Circumstances—Planned Special Exposures and Emergency Operations

EPA’s ACL of 500 mrem reflects EPA’s commitment to the ALARA principle of restricting worker exposure to harmful radiation whenever possible. In certain cases, **the RSO/SHEMP Manager or another designated person** might allow a worker to temporarily receive more than his or her administrative dose limits.

There are two scenarios in which elevated exposure levels are allowed:

1. *Planned special exposures.* In some cases, a worker might ask for permission to exceed his or her ACL temporarily to complete a long-term site project. Any request for planned special exposures should be submitted in writing to **the RSO/SHEMP Manager or another designated person** for approval. Approval of such requests must be granted before any planned special exposures are allowed to occur.
2. *Emergency operations.* Under certain emergency situations, EPA emergency response personnel may not be able to engage in advance discussions with **the RSO/SHEMP Manager or another designated person** to ask for permission to enter an environment that has exposures in excess of the ACL. EPA’s *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* provides guidelines for emergency workers to receive up to 5 rem for any activity related to an emergency response. **The RSO/SHEMP Manager or another designated person** should discuss this limit with emergency response personnel well before any potential emergency situation in order to properly inform the personnel of the risks associated with the elevated exposure level of 5 rem. As Table 2 shows, if efforts are needed to protect major property or human life, even higher exposure levels than 5 rem may be allowed.

NOTE: The permitting of “in the field” decisions regarding one’s dose does not replace the call-back procedures for notifying **the RSO/SHEMP Manager or another designated person** that may already be in place, but is designed to augment these procedures in emergency situations. In addition, emergency response personnel receiving any known or potential dose should alert **the RSO/SHEMP Manager or another designated person** as soon after the incident as is possible to do so.

When all emergency operations have been completed and recovery and cleanup have begun, then all exposures during this non-emergency phase will be limited to EPA’s ACL. Any departure from the ACL will be handled as a planned-special-exposure situation.

TABLE 2: RADIATION EXPOSURE LIMITS FOR EMERGENCY OPERATIONS^a

| Dose Limit (Total Effective Dose Equivalent) | Activity Performed | Conditions |
|--|---|--|
| 5 rem | All | |
| 10 rem | Protecting major property | Only on a voluntary basis where lower dose limit not practicable |
| 25 rem | Lifesaving or protection of large populations | Only on a voluntary basis where lower dose limit not practicable |

| | | |
|----------|---|---|
| > 25 rem | Lifesaving or protection of large populations | Only on a voluntary basis to personnel fully aware of the risk involved |
|----------|---|---|

a: Table comes from EPA 400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, 1992.

Notes:

1. The lens of the eye dose limit is 3 times the listed values.
2. The shallow dose limit to the skin of the whole body and the extremities is 10 times the listed value.

6.2.5 Monitoring Pregnant Workers and Addressing Concerns About the Embryo/Fetus

When a female worker declares that she is pregnant, special consideration is given to the radiation protection of the embryo or fetus. During pregnancy, EPA takes measures to ensure that the occupational exposure dose to the embryo/fetus is kept ALARA. Special consideration for embryo or fetus protection must not create a basis for job discrimination, and should be provided in conformance with the provisions of Title VII of the Civil Rights Act of 1964, as amended, regarding discrimination in employment practices, including hiring, discharge, compensation, and terms, conditions, or privileges of employment.

6.2.5.1 Educating Female Workers About the Potential Effects of Prenatal Radiation Exposure

The RSO/SHEMP Manager or another designated person will instruct workers about the potential health problems associated with prenatal radiation exposure. Female emergency response personnel will receive a copy of the [NRC Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure."](#) As noted earlier, information about Guide 8.13 is also included in the BRST course emergency response personnel receive before, or at the time of, enrolling in the personnel monitoring program.

6.2.5.2 Declaring Pregnancy

It is the responsibility of the worker to decide whether she will declare her pregnancy to her employer. If she decides to do so, she is responsible for coordinating with the Removal Manager and **the RSO/SHEMP Manager or another designated person** to address safety issues. A woman who declares that she is pregnant must submit a written declaration to **the RSO/SHEMP Manager or another designated person**. A sample "Declaration of Pregnancy" memorandum is included in [Appendix H](#). The worker should withdraw the declaration when she is no longer pregnant. If the declaration is not withdrawn, the written declaration will be considered expired 1 year after it was submitted.

6.2.5.3 Taking Measures to Ensure That Radiation Exposure To the Embryo/Fetus Is ALARA

Upon declaring pregnancy, the pregnant worker will continue to wear her whole-body TLD (normally worn on the torso) and exchanging that TLD on a quarterly basis. In addition, the **RSO/SHEMP Manager or another designated person** will issue a TLD for the embryo/fetus. This TLD (normally worn on the abdomen) must be exchanged on a monthly basis. The embryo/fetus will be subject to lower dose limits than those allowed for adults.¹ Lower dose limits and monthly monitoring will remain in effect until the woman withdraws the declaration of her pregnancy in writing, or if she is no longer pregnant.

¹ NRC Guide 8.13 indicates that the dose that an embryo/fetus is exposed to over the course of the entire pregnancy (i.e., 9 months) must not exceed 500 mrem. (For an adult worker, the limit is 500 mrem over a 12 month period.) In the course of a month, however, exposure to the embryo/fetus must not exceed the level that would translate to experiencing a 500 mrem exposure level over the course of the entire year. This means that the monthly exposure limit for the embryo/fetus is about 41.7 mrem. If the embryo/fetus were exposed to this level for all 9 months of the gestation period, this would result in an exposure level of 375 mrem, which is more protective than allowing 500 mrem over a 9 month gestation period.

Since the embryo/fetus has lower dose limits, the pregnant worker might need to consult with the Removal Manager and **the RSO/SHEMP Manager or another designated person** to determine whether her job functions will be affected. For example, she might need to stop performing some of her emergency response duties while she is pregnant.

6.3 Internal Exposure Monitoring

Internal exposure to radiation can occur through inhalation, ingestion, or dermal exposure pathways. Internal monitoring methods, such as bioassay and whole-body counting, can be used to estimate and assess internal dose. Under EPA's personnel monitoring program, internal monitoring may be warranted for OSCs and other EPA emergency response workers under a variety of situations. In addition to collecting site- and event-specific information, internal monitoring can also be used to verify whether site engineering controls are adequate.

Any EPA worker who has a known exposure, or who will be working in a known radiation environment (as determined by initial radiation- detection survey or continuous area monitoring) will contact **the RSO/SHEMP Manager or another designated person** to develop a plan for any internal monitoring that might be necessary. The plan will include information on the type and frequency of internal monitoring that will be performed, as well as the dose assessment procedures (including any baseline and exit monitoring) that will be used. Monitoring results will be reported, upon receipt, to the EPA worker and included in his or her medical monitoring records.

6.4 Recordkeeping and Notification Requirements

The following describes the recordkeeping and notification requirements associated with EPA's personnel monitoring program.

6.4.1 Dosimetry Records and Notification

The RSO/SHEMP Manager or another designated person will receive quarterly dosimetry reports from the dosimetry vendor. **The RSO/SHEMP Manager or another designated person** will ensure that these reports are available upon written request to workers. Any report of exposures over the ARL or ACL will be reported immediately to the worker.

The dosimetry vendor will also provide a copy of all TLD reports to EPA's SHEMD Headquarters office. Every year, SHEMD will send **the RSO/SHEMP Manager or another designated person** an NRC Form 5 ("Occupational Exposure Record for the Previous Year") for each worker who has enrolled in the personnel monitoring program. **The RSO/SHEMP Manager or another designated person** will distribute Annual Occupation Exposure records to the worker. **The RSO/SHEMP Manager or another designated person** will ensure that the worker's monitoring records become part of his or her employee medical monitoring information, and will ensure that the records are treated as sensitive personnel information.

Occupational Exposure Records will be protected from public disclosure because of the personal and private nature of the information contained in them. Therefore, any EPA worker who wishes to obtain information about TLD monitoring results from past years should contact **the RSO/SHEMP Manager or another designated person**, who will contact the Headquarters SHEMD to request an NRC Form 4 ("Cumulative Occupational Dose History").

Records will not be released to anyone other than the worker without their expressed written consent.

6.4.2 Recording Occupational Exposures

Emergency response personnel will be required to complete an “Exposure, Injury, and Dosimetry Tracking Form” and provide copies to **the RSO/SHEMP Manager or another designated person** on a quarterly basis. (The exposure tracking form, which is included in [Appendix I](#), is also presented in *EPA’s Medical Surveillance Program Implementation Plan*.) Each Removal Manager will set a date for regular submission of the form. Each worker will keep a copy of these forms for his or her own records. In addition, each worker will provide site-specific dosimetry reports to the RSO/SHEMP Manager and the Health and Safety Program Contact. These reports are to be included in the worker’s exposure and lifetime history record. (Copies of the “Exposure, Injury, and Dosimetry Tracking Form” and the site-specific dosimetry reports that are collected over the course of a year may be submitted as part of the worker’s annual physical examination, in lieu of completion of the exposure history.)

EPA workers who receive any type of known occupational exposure must report the exposure immediately to their direct supervisor. In addition, all known radiation exposure should be reported to **the RSO/SHEMP Manager or another designated person** as soon as possible so that any further exposure monitoring or dose assessments can be completed. The worker must also submit the following two forms to their supervisors:

- 1) Cover Memo to EPA Form 1440-9, “Supervisor’s Report of Accident/Illness,” and
- 2) EPA Form 1440-9, “Supervisor’s Report of Accident/Illness.”

Both of these forms are included in [Appendix J](#). The worker’s supervisor will complete the forms and provide copies to **the RSO/SHEMP Manager or another designated person**, who in turn will ensure that any other required forms are filled out and that any other necessary parties are notified (as required) of the occupational exposure.

If a worker reports an accident or illness, it is that worker’s responsibility to consult **the RSO/SHEMP Manager or another designated person** for advice and to inform the supervisor if he or she wants or needs follow-up medical evaluation, treatment, or time off from work. The **RSO/SHEMP Manager or another designated person** shall begin procedures for follow-up care or worker’s compensation as warranted. The worker’s supervisor shall retain approval authority in worker’s compensation and follow-up medical care cases. In an emergency situation in which immediate medical care is warranted, the appropriate forms may be submitted after the emergency medical care has been provided.

7.0 USING AND MAINTAINING RADIATION DETECTION EQUIPMENT

Radiation-detection equipment (e.g., Geiger counters and scintillation detectors) helps protect EPA workers who are performing field or emergency operations activities. Workers should know how to use this equipment and be aware of the significance of instrument readings. In order to obtain this desired level of readiness, emergency response personnel must receive training on radiation-detection equipment on a regular basis. In addition, equipment must be maintained and calibrated per manufacturer specifications and frequency requirements. These tasks—ensuring that training is available to workers and maintenance of equipment—are the responsibility of **the RSO/SHEMP Manager or another designated person** and the Health and Safety Program Contact. The Removal Manager will oversee these staff to ensure the

radiation-detection equipment maintenance and calibrations are performed as required to maintain the desired level of readiness.

7.1 Training on Radiation Detection Instrumentation

The Health and Safety Program Contact and the **the RSO/SHEMP Manager or another designated person** will ensure that emergency response personnel receive training on the proper use of radiation-detection instrumentation and that a log is maintained documenting who has received this training. **The RSO/SHEMP Manager or another designated person** will be held responsible for providing the training. He or she may do this by delivering the training himself (or herself) or by using other resources, such as manufacturer representatives, to assist in the training. Training on radiation- detection equipment will be held at least once every two years to ensure that all emergency response personnel maintain a level of proficiency with these instruments. Emergency response personnel will be held responsible for attending the training and maintaining proficiency.

7.2 Tracking, Maintaining, and Calibrating Radiation Detection Equipment

Each region should develop a list of radiation-detection equipment. The list should contain information on calibration and maintenance schedules. **The Health and Safety Program Contact or another designated person** is responsible for ensuring this list is developed and maintained current. In addition, **the Health and Safety Program Contact or another designated person** must ensure that the region's radiation-detection equipment is maintained and calibrated. He or she will also be expected to ensure that there is documentation of any maintenance and calibration activities performed and that this documentation is available for auditors and/or other stakeholders to review. **The Health and Safety Program Contact or another designated person** will also be expected to keep Standard Operation Procedures (SOPs) and calibration records with the instruments. Having this type of documentation readily available will ensure that workers have the information they need to confidently operate this equipment in the field.

8.0 USING EQUIPMENT THAT CONTAINS RADIOACTIVE SOURCES IN A SAFE MANNER

OSCs and other EPA emergency response personnel may use equipment that contains licensed or exempt radioactive sources. For example, when in the field, EPA workers might use gas chromatographs, x-ray fluorescent devices, and chemical agent monitors—all of which contain radioactive sources that require licensing—to monitor sites for chemical hazards. Isotopes commonly found in these devices are cadmium-109, iron-55, americium-241, curium-244, cobalt-57, and nickel-63. Because manufacturers routinely improve upon these devices, the actual mix of isotopes will vary from manufacturer to manufacturer and from device to device. However, the principles for handling radioactive materials do not generally vary, and the requirements for procuring, maintaining, and disposing of these devices will remain constant. In addition, radiation-detection equipment, such as Geiger counters, often contain exempt quantities of radioactive materials in the form of check sources. While these sources are not governed by NRC licensing requirements, transportation of these check sources or other exempt quantities must be accompanied by paperwork.

This section describes procedures for procuring, storing, securing, inventorying, testing, transporting, disposing of, and excessing equipment that contains radioactive sources. In addition, this section describes what should be done to ensure that NRC or agreement state licensing requirements for radioactive sources are met. Coordination is required between the RSO/SHEMP Manager, the Health and Safety Program Contact, and individual emergency response personnel to ensure that each region handles equipment that contains radioactive sources in a responsible manner.

8.1 Meeting NRC Licence Requirements

Each region must ensure that NRC license requirements, as applicable, are met. The possession and use of radioactive material is regulated by the requirements of either a general or specific license. Therefore, no person shall manufacture, produce, transfer, receive, acquire, own, possess, or use byproduct material except as authorized in a specific or general license. The only exceptions to this are devices that contain radioactive material below exempt quantities, as defined by the NRC. As a result, each region must ensure that all license conditions and requirements, whether general or specific, are met. **The RSO/SHEMP Manager or another designated person** is responsible for meeting the necessary requirements of the NRC license for radioactive materials in equipment. As part of this effort, **the RSO/SHEMP Manager or another designated person** must coordinate any applicable NRC audits. The Removal Manager is charged with checking in with the people who manage and use the equipment to ensure that it is stored, maintained, and transported properly.

8.2 Purchase, Storage, and Security

The RSO/SHEMP Manager or another designated person is responsible for the procurement of all equipment that contains licensed radioactive sources. He or she will ensure that all licensing and possession requirements are met and that any necessary license amendments are made. Procurement requests must include a disposal plan to ensure proper disposal of the device at the end of its life and to plan for the financial burden of disposal.

Radioactive materials will be stored and secured in a manner that protects individuals from being exposed to and/or contaminated by the material. It is important to secure radioactive materials against theft. Several people, including OSCs and **the RSO/SHEMP Manager or another designated person**, will play a role in ensuring that equipment that contains radioactive sources is properly secured and stored. For example, the security of equipment that is stored in central EPA offices and locations will be the responsibility of **the RSO/SHEMP Manager or another designated person** and will be monitored by **the RSO/SHEMP Manager or another designated person**. When the equipment is in the field, however, the OSC will be responsible for its storage and security. All site-specific requirements pertaining to the storage and security of this equipment are the responsibility of the OSC and should be communicated to **the RSO/SHEMP Manager or another designated person**. If this equipment becomes damaged, lost, or stolen, **the RSO/SHEMP Manager or another designated person** will be notified.

8.3 Taking an Inventory

Within each region, a list of region-owned or region-furnished equipment that contains licensed radioactive sources should be developed and maintained. The following information should be recorded for each piece of equipment:

- Radioactive isotopes contained within the device.
- Training and certification requirements.
- Maintenance and wipe sample records.
- Guidelines and notification procedures for the transportation of the device.

The RSO/SHEMP Manager or another designated person will coordinate with the Health and Safety Program Contact to maintain the list of equipment. On a semi-annual basis, **the RSO/SHEMP Manager or another designated person** will verify the accuracy of the inventory list.

8.4 Performing Leak Tests, Wipe Samples, and Maintenance Activities

Leak testing will be performed to satisfy licensing requirements, as applicable, and to ensure that there has been no breach in the integrity of the sealed source within the device. [redacted] will perform and maintain records of the leak tests. Leak tests will be performed on a semi-annual basis and can occur simultaneously with the semi-annual inventory review (described above). Some manufacturers allow for longer intervals between leak testing, but any departures from the semi-annual timeframe should be at the discretion of **the RSO/SHEMP Manager or another designated person**.

Maintenance and wipe sampling will be performed by **the RSO/SHEMP Manager or another designated person** in accordance with license requirements, as applicable, and the records of maintenance will be recorded and stored by [redacted]. In addition, [redacted] will be held responsible for ensuring that copies of the wipe sample records are located with the instrument. [redacted] is responsible for meeting training and certification requirements for these types of equipment and of maintaining documentation that these requirements have been met.

8.5 Shipping and Transporting Equipment That Contains Licensed Radioactive Sources

[redacted] is responsible for developing guidelines for transportation and notification procedures to ensure that equipment that contains licensed radioactive sources is properly tracked during transport. [redacted] is responsible for ensuring that those guidelines are consistently followed.

Emergency response personnel should consult with **the RSO/SHEMP Manager or another designated person** before attempting to transport materials, and **the RSO/SHEMP Manager or another designated person** should furnish the forms that are required to accompany the instrumentation. The shipping and transportation package should accompany each device that contains radioactive materials. Each shipping and transportation package (obtained with the assistance of **the RSO/SHEMP Manager or another designated person**) will contain:

- A copy of the equipment instruction manual.
- A copy of the most recent leak test results.
- A copy of the U.S. Department of Transportation (DOT) Type A certification for equipment cases if applicable.
- A copy of emergency contact numbers and notification procedures.
- A copy of any reciprocity agreements from agreement states.
- Any other appropriate DOT shipping papers.

8.5.1 Transporting Exempt Sources

Exempt quantities of radioactive material represent a unique situation because they are not governed by NRC-licensing requirements. These exempt quantities are often used as check sources for radiation-detection equipment or for training purposes. The transportation of exempt sources is the responsibility of **the RSO/SHEMP Manager or another designated person**. This individual is responsible for ensuring exempt sources are accompanied by the required paperwork. Sample forms are provided in [Appendix K](#).

8.5.2 Inter-regional Transportation of Equipment

Inter-regional transportation of equipment will be coordinated by **the RSO/SHEMP Manager or another designated person**, on a case-by-case basis.

8.6 Disposing of and Excessing Equipment

Each region must ensure that equipment that contains radioactive sources is disposed of or excessed properly. No devices containing radioactive materials will be transferred to the General Services Administration. If a device is transferred, it must be transferred to a qualified licensed entity. Within region , is responsible for disposal or excessing of equipment that contains radioactive sources. Within the Removal Program, is responsible for notifying and coordinating with **the RSO/SHEMP Manager or another designated person** when ready to dispose of or excess equipment.

9.0 RECORDKEEPING

Proper recordkeeping is an essential component of a radiation health and safety program. The goal is to ensure that nationally consistent, readily accessible records are maintained in each region. The recordkeeping requirements associated with different components of the radiation health and safety program have been discussed throughout this Implementation Plan. Table 3 provides a summary of these recordkeeping requirements. The table includes information about specific forms that should be used, and it directs readers to specific sections of the Implementation Plan that provide information about recordkeeping activities.

**TABLE 3:
RECORDS ASSOCIATED WITH THE RADIATION HEALTH AND SAFETY PROGRAM**

| Required Records | Specified Forms | Reference for Detailed Procedures |
|--|--|-----------------------------------|
| Training certification for BRST, ARST, and refresher courses | Letter (see Appendix D) | Section 5.2 |
| Training waivers | Letter (see Appendix E) | Section 5.3 |
| Records associated with TLD Enrollment | TLD Enrollment Request (see Appendix F) | Section 6.1 |
| | Authorization for Release of Occupational Radiation Exposure Information (see Appendix F) | |
| | List documenting which employees are enrolled in the region's personnel monitoring program | |

| Required Records | Specified Forms | Reference for Detailed Procedures |
|---|--|-----------------------------------|
| Documentation associated with TLD badge training | Log documenting who has received training | Section 6.2.1.1 |
| Documentation of lost, damaged, or broken TLDs | Log documenting the status of employee TLDs | Section 6.2.1.3 |
| Records associated with SRDs | Logs documenting SRD distribution/assignments | Section 6.2.3 |
| | Exposure Record Cards (see Appendix G) | |
| | Maintenance records for SRDs | |
| Records associated with planned special exposures | Requests for planned special exposures | Section 6.2.4.3 |
| | Approvals for planned special exposures | |
| Written declaration of pregnancy | Memorandum for Declaration of Pregnancy (see Appendix H) | Section 6.2.5.2 |
| Dosimetry records | Quarterly Dosimetry Reports provided by TLD badge vendors | Section 6.4.1 |
| | NRC Form 5 (Occupational Exposure Record for the Previous Year) | |
| | Annual Occupational Exposure Records | |
| | NRC Form 4 (Cumulative Occupational Dose History) | |
| Occupational Exposures | Exposure, Injury, and Dosimetry Tracking Form (see Appendix I) | Section 6.4.2 |
| | Supervisor's Report of Accident/Illness (cover memo and EPA Form 1440-9) (see Appendix J) | |
| Documentation associated with radiation-detection instrumentation | Log documenting who has received training on the proper use of radiation-detection instrumentation | Section 7.1 |
| | Inventory that lists all of the region's radiation-detection equipment and presents information on calibration and maintenance schedules | Section 7.2 |
| | Documentation of maintenance/calibration activities performed on radiation-detection equipment | |
| Records associated with equipment that contains radioactive sources | Inventory of region's equipment that contains radioactive sources | Section 8.3 |
| | Leak tests results | Section 8.4 |
| | Records documenting maintenance activities | |

| Required Records | Specified Forms | Reference for Detailed Procedures |
|--|--|-----------------------------------|
| | Wipe sample records | |
| | Documentation confirming that the person who is performing testing and maintenance activities has received training/certification for this equipment | |
| | Shipping and transport packages that must accompany equipment being transported | Section 8.5 |
| | Paperwork associated with the transport of exempt sources (see Appendix K) | Section 8.5.1 |
| Radiation Health and Safety Program Audit Form | Checklist (see Appendix L) | Section 10.1 |

10.0 AUDITS AND PROGRAM EVALUATION

Evaluations should be performed to ensure that EPA's radiation health and safety program is being implemented consistently across the nation and that the program is actually protecting employees. Toward this end, internal, as well as external audits, should be conducted on an annual basis to examine each region's program.

10.1 Internal Audit/Program Evaluation

The Removal Manager, RSO/SHEMP Manager, and the Health and Safety Program Contact should work together to evaluate their region's radiation health and safety program on an annual basis. The goal of the evaluation will be to assess whether the program is being implemented in accordance with the [national minimum standards](#) that are presented throughout this chapter with relation to obtaining training, adhering to personnel monitoring procedures, using radiation-detection equipment, and handling equipment that contains radioactive sources. [Appendix L](#) presents a checklist that can be used to assist in the evaluation process. This checklist should be filled out annually and kept on file with **the RSO/SHEMP Manager or another designated person**. If program deficiencies are identified during the audit process, the Removal Manager and the **the RSO/SHEMP Manager or another designated person** will fix these deficiencies so as to comply with EPA's national minimum standards.

10.2 External Evaluations

Once a year, representatives from the Core ER team visit each EPA region to examine the elements of the region's health and safety program. As part of this effort, Core ER representatives will be expected to evaluate each region's radiation health and safety program and to pay specific attention to whether the program is being implemented in a consistent fashion across the nation. The Removal Manager, RSO/SHEMP Manager, and Health and Safety Program Contact will work with the Core ER representatives to ensure that they have the information they need to perform the evaluation.

11.0 GLOSSARY

Action Reference Level (ARL)

A quantitative level of an individual's occupational exposure to ionizing radiation at or above which a review by management is conducted. A dose equivalent level of 50 mrem (0.50 milliSievert) per quarter whole-body dose from external exposure or internal effective dose equivalent has been established as the Action Reference Level under EPA's Radiation Safety and Health Protection Program.

Administrative Control Level (ACL)

The maximum dose permitted under the EPA Radiation Safety and Health Protection Program during a period of any 12 consecutive calendar months. EPA has established a dose limit of 500 mrem (5.0 milliSievert), total effective dose equivalent from internal (committed effective dose equivalent) plus external whole body dose.

Agreement State

A state that has signed an agreement with the Nuclear Regulatory Commission under which the state regulates the use of byproduct, source, and small quantities of special nuclear material within that state.

As Low As Reasonably Achievable (ALARA)

An approach to radiological protection to control or manage exposures (both individual and collective to the work force and general public) to as low as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit, but a process whose objective is to achieve dose levels as far below applicable limits as reasonably achievable.

Committed Dose Equivalent

The total amount of dose equivalent projected to be absorbed by an individual over a 50-year period after intake of a radionuclide.

Committed Effective Dose Equivalent

The total amount of effective dose equivalent projected to be absorbed by the whole body over a 50-year period after a radionuclide is taken into the body, taking into account organ specific weighting factor(s). It does not include contributions from external dose.

Dose

A general term denoting the quantity of radiation or energy absorbed. For special purposes, it must be appropriately qualified. If unqualified, it refers to absorbed dose.

Dose Equivalent (H)

The amount of dose absorbed in tissue that considers the different biological effects of different types of radiation (i.e. x-ray, alpha, neutrons). It is the product of absorbed dose in tissue (D), a radiation specific quality factor (Q), and any other modifying factors (N), where $H=DQN$. The dose equivalent has the unit term "rem" or "Sievert."

Effective Dose Equivalent

The amount of dose equivalent received that considers the differing sensitivities of various tissues to effects of radiation exposure. It is the sum of the product of the dose equivalent and a tissue specific weighting factor.

External Dose

The portion of the dose equivalent received from radiation sources outside the body.

External Exposure

The dose of radiation received by an individual from a source of ionizing radiation outside the body.

Federal Radiological Emergency Response Plan (FRERP)

The FRERP is the interagency contingency plan that describes the roles and responsibilities of the response agencies when they respond to radiological incidents. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) defines FRERP as the interagency agreement for coordinating the response of various agencies, under a variety of statutes, to a large radiological accident. The lead federal agency, defined by the FRERP, activates the FRERP for any peacetime radiological emergency that, based upon FRERP's professional judgement, is expected to have a significant radiological effect within the United States, its territories, possessions, or territorial waters, and that could require a response by several federal agencies.

Gray

The International System unit for absorbed dose without the quality factor being taken into consideration.

Health and Safety Program Contact

The designated OSC within the Emergency Response Section who is the primary point of contact for OSCs (and other emergency response personnel) on all health and safety issues, including emergency response radiation issues.

Internal Dose

The portion of dose equivalent received from radioactive materials taken into the body by ingestion, inhalation, or dermal contact.

Internal Exposure

The dose of radiation received by the internal organs of the body from radionuclides ingested, inhaled, or absorbed into the body.

Ionizing Radiation

Any electromagnetic or particulate radiation capable of displacing electrons from atoms or molecules—directly or indirectly—on its passage through matter, thereby producing ions. Alpha and beta particles, gamma rays, x-rays, and neutrons are examples of ionizing radiation.

Millirem (mrem)

One one-thousandth of a rem.

MilliSievert

One one-thousandth of a Sievert. 1 milliSievert = 100 mrem.

Occupationally Exposed Worker

Individuals who have a significant potential for exposure to radiation while on the job.

On-scene coordinator (OSC)

An OSC is a predesignated federal official who oversees response activities at oil spills and hazardous substance releases. The OSC ensures that the response is appropriate and timely, while minimizing environmental damage and protecting public health. The NCP defines an OSC as the federal official predesignated by EPA or the U.S. Coast Guard to coordinate and direct responses under subpart D, or the government official designated by the lead agency to coordinate and direct removal actions under subpart E of the NCP.

Quality Factor (Q)

A principal modifying factor which is used in radiation protection for deriving the dose equivalent (H), from absorbed dose (rad or Gray). The quality factor is a linear-energy transfer dependent factor selected to account for the relative biological effectiveness of the radiation in question, and is independent of the tissue or organ under consideration. The quality factor (Q) for beta, gamma rays and x-rays is set at 1. Q for alphas can reach 20. Q for neutrons are between 6 to 10.

Rad

The traditional measure of absorbed dose without a quality factor taken into consideration.

Radiation Safety Officer (RSO)

The designated EPA person, qualified by virtue of education, training, and/or professional experience, who ensures that all work is conducted in accordance with the requirements of the Radiation Safety and Health Protection Program and any applicable facility licenses.

Removal Manager

The direct line supervisor to OSCs and other emergency response personnel. The Removal Manager is responsible for managing the resources necessary for OSCs to effectively accomplish removals and emergency response work.

Roentgen Equivalent Man (rem)

The unit of dose equivalent (H), for any type of ionizing radiation absorbed by the body tissue, in terms of its estimated biological effect, relative to an absorbed dose from exposure to 1 roentgen of high-energy gamma or x-rays.

SHEMP Manager

The SHEMP Manager is the regional point of contact for health and safety issues. The SHEMP Manager is responsible for ensuring that a region complies with SHEM directives, OSHA guidelines and other applicable regulations that are designed to protect workers' health.

Sievert

The International System Unit of dose equivalent. 1 Sievert = 100 rem.

Thermoluminescent Dosimeter (TLD)

A device made of a certain crystalline material that can both store a fraction of absorbed ionizing radiation and release this energy in the form of visible photons when heated. The amount of light released can be used as a measure of radiation exposure. These devices are used for monitoring whole body personnel radiation exposure; they can measure both shallow and penetrating components of ionizing radiation.

Total Effective Dose Equivalent (TEDE)

The total amount of dose received by an individual that considers any external or internal doses received. It is the sum of the Committed Effective Dose Equivalent and the Whole Body External Dose Equivalent.

APPENDIX A:

Designation of Roles and Responsibilities to Support EPA's Radiation Health and Safety Implementation Plan

Background Information:

Table A-1 provides a list of activities that must be performed to ensure the smooth operation of a regional radiation health and safety protection program.

The tasks are listed in rows. EPA position titles are listed in columns. Check marks are used to assign each task to a specific individual. The Radiation Health and Safety Working Group has made an effort to fill in many of the check marks, thereby assigning tasks to specific position titles (e.g., the Removal Manager or the Health and Safety Program Contact). (For some of the tasks, a check mark has been placed in two or more columns to indicate that more than one individual bears some responsibility for that task.) **Please note that regional representatives can move the pre-filled check marks to re-delegate tasks if doing so makes sense for a particular region.**

Instructions:

The major stakeholders who are responsible for implementing their region's radiation health and safety program are expected to review and complete Table A-1 on a biannual basis. When doing so, care should be taken to:

1. Fill in the background information that is requested at the top of the page on page A-3. For example, indicate when the table is being updated and who is doing the updating.
2. Fill in actual names under the position titles.
3. Add columns to include additional key players (if necessary).
4. Make sure that EVERY task is assigned to a specific individual. This requires the following:
 - *Make sure that you agree with the placement of the pre-filled check marks.*
 - *Assign responsibility for tasks that do not have a pre-filled check mark.* The Radiation Health and Safety Working Group did not make an attempt to presume who (within each region) would be held responsible for each and every task listed in Table A-1. For example, no pre-filled checkmarks have been inserted for tasks #18, 67, 69-73, 77, or 78. Check marks must be inserted for these tasks, however, before Table A-1 can be considered complete.
 - *Address the "RSO/SHEMP Manager" category.* For some of the tasks listed in Table A-1, a check mark has been placed in the "or" column between the "RSO" and the "SHEMP Manager" columns. The Radiation Health and Safety Working Group did this to communicate its opinion that the task should be assigned to the RSO *or* the SHEMP Manager. The Working Group did not think it was appropriate, however, to prescribe exactly how the tasks should be allocated between these two positions. This is left for the regions to decide. Before Table A-1 can be considered complete, all of the check marks that appear in the "or" column should be deleted and placed under a specific position title.
5. Search for spaces highlighted in yellow and fill in actual EPA position titles into the spaces. (See tasks #22, 38, 53, 67, 77, 78, 88, 94, 96-105, and 107-109.)

TABLE A-1: TASK CHART FOR IMPLEMENTING REGIONAL RADIATION HEALTH AND SAFETY PROTECTION PROGRAMS

Region [REDACTED]
 Last Updated on: Month [REDACTED] Day, [REDACTED] Year [REDACTED].
 Updated by [REDACTED]

| | Who is Responsible for Each Task or Action? | | | | | | |
|--|---|---|-----------------------------------|------------------------------|-------------|---|---------------|
| ROLES ▶ | Removal Manager | SHEMP Manager OR Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) | |
| Name of person in role ▶ | (Name) | (Name) | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| General Managerial and Administrative Tasks Performed to Support the Radiation Health and Safety Program | | | | | | | |
| 1. On a biannual basis, call together the major stakeholders who are involved in implementing the region's Radiation Health and Safety Program. Take notes during the meetings. Update the Radiation Health and Safety Implementation Plan by filling in blanks and completing Table A-1. Pass out updated copies. | | ✓ | | | | | |
| 2. Ensure that the national minimum standards for EPA's Radiation Health and Safety Program are met and maintained. | ✓ | | | | | | |
| 3. Support radiation-safety related programs established by the SHEMP Manager and the RSO. Also, assign someone to serve as a Health and Safety Program Contact. | ✓ | | | | | | |
| 4. Authorize the use of funds and human resources to implement and support the Radiation Health and Safety Program. | ✓ | | | | | | |
| 5. Develop and operate a Radiation Health and Safety Program that ensures compliance with all NRC or applicable agreement state radioactive license conditions. | | ✓ | | | | | |
| 6. Serve as the regional point of contact on radiation-safety issues for emergency responders. (Facilitate and coordinate communication between the managers who administer the Radiation Health and Safety Program and the emergency responders subjected to the program.) | | | ✓ | | | | |
| Managerial and Administrative Duties Associated With Radiation-Safety Training | | | | | | | |
| 7. Allot time and travel money for emergency response personnel to take radiation-safety courses. | ✓ | | | | | | |
| 8. Ensure that emergency response and field work activities are restricted for workers who have failed to meet their radiation-safety training requirements. | ✓ | | | | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 9. Develop, organize, and coordinate a radiation-safety training program and make sure training is available to all emergency response personnel. | | ✓ | | ✓ | ✓ | | | |
| 10. Ensure that all incoming emergency response personnel receive a Basic Radiation Safety Training (BRST) course. | | | ✓ | | | | | |
| 11. Offer an Advanced Radiation Safety Training (ARST) course in each region at least once per year or, as an alternative, provide a list of courses that meet ARST requirements that EPA emergency responders can attend. | | | ✓ | | | | | |
| 12. In cases where an emergency responder takes a BRST course or ARST course from an outside source, determine whether the course adequately meets the objectives for BRST-level and ARST-level courses. | | | ✓ | | | | | |
| 13. Develop a BRST exam and an ARST exam (or identify existing exams) that can be administered to emergency response personnel to determine whether they have absorbed the concepts presented in their BRST and ARST training courses. | | | ✓ | | | | | |
| 14. Administer and grade the BRST exam and ARST exam . Work with those who fail to achieve a score of at least 80 percent to make sure they receive the support they require to obtain a thorough understanding of the training materials. | | | ✓ | | | | | |
| 15. Provide refresher radiation-safety training courses on a regular basis and administer an exam to determine whether trainees have absorbed the material presented in the refresher course. | | | ✓ | | | | | |
| 16. Determine whether the following training modules should be incorporated into the BRST or the ARST course: (1) TLD guidance, and (2) the proper use of radiation-detection equipment. (As an alternative, these modules can be taught as standalone courses.) | | | ✓ | | | | | |
| 17. Fill out a training certification letter (see Appendix D) whenever a worker successfully completes a training course. Provide copies of the letter to the worker, the Removal Manager, and the Health and Safety Program Contact. | | | ✓ | | | | | |

| | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| ROLES ▶ | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| Name of person in role ▶ | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 18. Maintain training documentation for all of the region's emergency response personnel in a permanent repository that is accessible to the Removal Manager, the RSO, SHEMP Manager, and emergency response personnel. | | | | | | | | |
| 19. Monitor and track which EPA emergency responders have (or have not) met their radiation-safety training requirements. | | | ✓ | | ✓ | | | |
| 20. Notify emergency response personnel and the Removal Manager if an employee is missing a radiation-safety training requirement. Also, notify them when training courses are available. | | | ✓ | | | | | |
| 21. Assess whether it is appropriate to issue a training waiver to specific employees if an emergency situation arises and a worker has not yet completed his or her training requirements. If so, issue a Training Waiver Letter (see Appendix E) and maintain a record of the waiver. | | | ✓ | | | | | |
| Managerial and Administrative Duties Associated With the Personnel Monitoring Program | | | | | | | | |
| 22. Notify the RSO/SHEMP Manager or another designated person when new emergency response personnel are hired. Follow up to make sure that new hires are enrolled in EPA's Personnel Monitoring Program. | ✓ | | | | | | | |
| 23. Enroll new EPA emergency responders into the Personnel Monitoring Program by doing the following: ■ Ask workers to fill out enrollment forms (see Appendix F) and collect the completed forms. ■ Ask workers to provide prior employer information and to indicate whether previous employers collected radiation dosimetry data. If such data exist, ask the worker to sign a release (see Appendix F) for his or her previous exposure records. ■ Determine whether enrollees require radionuclide-specific baseline bioassays. | | | ✓ | | | | | |
| 24. Maintain a list of the employees who are enrolled in the Personnel Monitoring Program. | | | ✓ | | ✓ | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|------------------|---|--------------------------------------|------------------------------------|-------------|---|--------|
| | Removal Manager | SHEMP Manager | OR Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) | |
| | (Name) | (Name) | (Name) | (Name) | (Names) | (Names) | (Name) | (Name) |
| 25. Schedule a radionuclide-specific bioassay when an employee leaves EPA if necessary. (Note: Exit bioassays are only required if an employee received a baseline radionuclide-specific bioassay at any point during his or her participation in EPA's Personnel Monitoring Program.) | | | ✓ | | | | | |
| 26. Provide training on TLD badges to EPA emergency response personnel and maintain a log documenting who has received the training. | | | ✓ | | | | | |
| 27. Determine if the TLD default exchange schedule (i.e., exchanging TLD badges on a calendar-quarterly basis) is acceptable, or whether it is necessary to increase the frequency of exchange for work that is being performed at a particular site. | | | ✓ | | | | | |
| 28. Identify locations where TLD badges can be stored. | | | ✓ | ✓ | | | | |
| 29. Issue replacement badges if a TLD is lost or damaged. Also, document the loss and decide (based on a follow-up investigation) whether to estimate and record an exposure dose for the time period for which the TLD badge was lost, damaged, or compromised. | | | ✓ | | | | | |
| 30. If someone requests to have an assigned dose removed from an employee's official exposure record, evaluate that request and determine whether it should be granted. | | | ✓ | | | | | |
| 31. Determine whether it is necessary to issue special dosimeters (e.g., extremity TLD dosimeters, neutron dosimeters, or alpha dosimeters) to EPA emergency responders working at a particular site. If so, ensure that these special dosimeters are made available to emergency responders. | | | ✓ | | | | | |
| 32. Distribute SRD devices and Exposure Record Cards to EPA emergency personnel who have: (1) enrolled in the TLD program, and (2) received a passing grade on the BRST exam. | | | ✓ | | | | | |
| 33. Maintain copies of the SRD distribution and assignment records. | | | ✓ | ✓ | | | | |
| 34. Provide information to emergency responders on how to use their SRDs and how to fill out Exposure Record Cards. | | | ✓ | | | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 35. Collect damaged SRDs that have been turned in. | | | ✓ | | | | | |
| 36. Collect and redistribute SRDs and ensure that the SRDs are zeroed or re-zeroed at the start of each incident. | | | ✓ | | | | | |
| 37. Set dose alarms for the SRDs and determine whether it is necessary to deviate from the alarm settings proposed in the radiation Health and Safety Implementation Plan. | | | ✓ | | | | | |
| 38. Perform routine cleaning and battery replacements on SRD devices, and send records of maintenance activities to the RSO/SHEMP Manager or another designated person. | | | | | ✓ | | | |
| 39. Maintain records of all the maintenance activities that have been performed on SRD devices. (Note: Make sure the name checked off for this assignment matches the name filled in the blank for task #38.) | | | ✓ | | | | | |
| 40. Serve as a contact person for dosimeter service providers, collect quarterly dosimetry reports from them, and ensure that these reports are available to workers upon written request. Instruct the dosimeter service providers to call immediately if a TLD badge records a dose that exceeds the Agency's Action Reference Level (ARL) of 50 mrem/quarter or the Administrative Control Level (ACL) of 500 mrem/year. In such an event, immediately notify the affected worker and his/her Removal Manager about the exceedence. | | | ✓ | | | | | |
| 41. If dosimetry data suggest that a worker has been exposed to radiation doses in excess of the Agency's ARL or ACL, collaborate with the worker to review the circumstances that led to the exceedence. Also, depending on the situation, consider the following: <ul style="list-style-type: none"> Recommend additional exposure monitoring in an effort to identify the radiation source. Modify the worker's practices until the source of radiation is found identified and proper protective measures are instituted. Prevent the worker from working on assignments that would expose him/her to additional radiation for the rest of the year. | ✓ | | ✓ | | | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|------------------|---|--------------------------------------|------------------------------------|-------------|---|--------|
| | Removal Manager | SHEMP Manager | OR Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) | |
| | (Name) | (Name) | (Name) | (Name) | (Names) | (Names) | (Name) | (Name) |
| 42. Evaluate requests for planned special exposures to determine whether a worker will be allowed to temporarily exceed the Agency's ACL of 500 mrem/year. Also, provide consult to workers who might be exposed to elevated exposure levels during emergency operation scenarios. | | | ✓ | | | | | |
| 43. Inform workers that exposure levels up to 5 rem are allowed during emergency operations. Inform workers of the risks associated with the elevated exposure level well in advance of an emergency situation. | | | ✓ | | | | | |
| 44. Instruct workers about the potential health problems associated with prenatal radiation exposure. Ensure that female emergency response personnel receive a copy of the NRC Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure." | | | ✓ | | | | | |
| 45. Issue an extra TLD badge to workers who have declared that they are pregnant. Also, instruct the worker that this badge, which is intended to monitor exposures to the embryo/fetus, is subject to lower administrative dose limits and must be exchanged on a monthly basis. | | | ✓ | | | | | |
| 46. Talk to pregnant workers about: (1) extra precautionary measures that should be taken to protect the embryo/fetus, and (2) whether it is necessary to modify their job functions during their pregnancy. | ✓ | | ✓ | | | | | |
| 47. If necessary, assist emergency response personnel in developing an internal monitoring plan. | | | ✓ | | | | | |
| 48. Collect NRC Form 5 (Occupational Exposure Record for the Previous Year) for each worker who has enrolled in the personnel monitoring program. (Note: These reports will be provided by EPA's central SHEMD office in Washington, DC.) | | | ✓ | | | | | |
| 49. Distribute Annual Occupation Exposure records to each worker. | | | ✓ | | | | | |
| 50. Ensure that all of a worker's radiation-exposure monitoring records become part of his or her employee medical monitoring file, and ensure that the records are treated as sensitive personal information. | | | ✓ | | | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|---------------|--------|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | (Name) | (Name) | (Names) | (Names) | (Name) | (Name) |
| 51. Set deadlines for workers to submit their "Exposure, Injury, and Dosimetry Tracking Forms." | ✓ | | | | | | | |
| 52. Collect "Exposure, Injury, and Dosimetry Tracking Forms" from EPA emergency responders on a quarterly basis. In addition, collect all site-specific dosimetry reports (e.g., Exposure Record Cards and any reports generated from special dosimeters, such as alpha dosimeters) at the end of each incident response, or at least quarterly. | | ✓ | | | | | | |
| 53. Collect EPA Form 1440-9 forms from emergency responders who have received any type of known occupational exposure to radiation. Complete the forms for the workers and provide copies to the RSO/SHEMP Manager or another designated person. | | | | | | ✓ | | |
| 54. Upon receiving copies of a worker's EPA Form 1440-9, ensure that any other required forms are filled out and that any other necessary parties are notified of occupational exposures that have occurred. Also, if necessary, initiate procedures for follow-up medical care or worker's compensation. (Note: Make sure the name checked off for this assignment matches the name filled in the blank for task #53.) | | ✓ | | | | | | |
| 55. Grant (or deny) final approval in worker's compensation and follow-up medical care cases. | | | | | | ✓ | | |
| Managerial and Administrative Duties Associated With Using and Maintaining Radiation Detection Equipment | | | | | | | | |
| 56. Assume overall responsibility for making sure that the region's radiation-detection equipment is maintained at a high level of readiness. | ✓ | | | | | | | |
| 57. Ensure that emergency response personnel receive training on the proper use of radiation-detection equipment. Make sure this training is provided at least once every 2 years. Also, maintain records documenting that workers have received the training. | | ✓ | | ✓ | | | | |
| 58. Develop a list of the region's radiation-detection equipment. Make sure the list stays current. | | | | ✓ | | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 59. Ensure that the region's radiation-detection equipment is maintained and calibrated. Also, make sure that all maintenance and calibration activities are documented and that documentation is readily available for auditors and other stakeholders to review. | | | | | ✓ | | | |
| 60. Make sure Standard Operation Procedures (SOPs) and calibration records are kept with all radiation-detection instruments. | | | | | ✓ | | | |
| Managerial and Administrative Duties Associated With Using Equipment That Contains Radioactive Sources | | | | | | | | |
| 61. Check in regularly with those who manage and use equipment that contains radioactive sources to ensure that the equipment is stored, maintained, and transported properly. | ✓ | | | | | | | |
| 62. Meet the necessary requirements of the NRC licence for radioactive materials in equipment. | | | ✓ | | | | | |
| 63. Coordinate any applicable NRC audits. | | | ✓ | | | | | |
| 64. Procure equipment that contains licensed radioactive sources. (Ensure that all licensing and possession requirements are met and that any necessary license amendments are made. Also, ensure that procurement requests include a disposal plan.) | | | ✓ | | | | | |
| 65. Take responsibility for the security of equipment that contains radioactive sources when it is being stored in central EPA offices and locations. | | | ✓ | | | | | |
| 66. Develop and maintain a list of region-owned or region-furnished equipment that contains licensed radioactive sources. Verify the accuracy of the inventory list on a semi-annual basis. | | | ✓ | | ✓ | | | |
| 67. Perform leak tests (on a semi-annual basis) on equipment that contains radioactive materials. Ensure that records are maintained of these activities. (Note: Some manufacturers allow for longer intervals between leak testing, but any departures from the semi-annual timeframe should be at the discretion of the RSO/SHEMP Manager or another designated person.) | | | | | | | | |
| 68. Perform maintenance and wipe sampling on equipment that contains radioactive materials in accordance with license requirements. | | | ✓ | | | | | |
| 69. Retain records that document maintenance activities performed | | | | | | | | |

| | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| ROLES ▶ | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| Name of person in role ▶ | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| on equipment that contains radioactive materials. | | | | | | | | |
| 70. Ensure that copies of wipe sample records are located with all pieces of equipment that contain radioactive materials. | | | | | | | | |
| 71. Ensure that all training and certification requirements are met for equipment that contains radioactive materials. Also, ensure that the appropriate documentation is obtained to verify that these requirements have been met. | | | | | | | | |
| 72. Develop guidelines for transportation and notification procedures to ensure that equipment that contains licensed radioactive sources is properly tracked during transport. | | | | | | | | |
| 73. Ensure that the transportation and notification guidelines established for equipment that contains licensed radioactive sources are consistently followed. | | | | | | | | |
| 74. Furnish the forms that are required to accompany the transport of equipment that contains radioactive sources. | | | ✓ | | | | | |
| 75. Ensure that exempt sources are accompanied by the appropriate transport paperwork. | | | ✓ | | | | | |
| 76. Coordinate inter-regional transportation of equipment that contains radioactive sources. | | | ✓ | | | | | |
| 77. Within region [redacted], ensure that equipment that contains radioactive sources is disposed of or excessed properly. | | | | | | | | |
| 78. Within the Removal Program, assume responsibility for notifying and coordinating with [redacted] the RSO/SHEMP Manager or another designated person [redacted] when ready to dispose of or excess equipment. | | | | | | | | |
| Managerial and Administrative Duties Associated With The Audit Process | | | | | | | | |
| 79. Perform internal audits and program evaluations to determine whether the radiation health and safety program is being implemented in accordance with the national minimum standards that appear throughout this document. | ✓ | | ✓ | | ✓ | | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 80. Fill out the <i>Radiation Health and Safety Program Audit Form</i> (see Appendix L) on an annual basis and retain copies of that form. | | | ✓ | | | | | |
| 81. Take steps to correct program deficiencies identified during audits. | ✓ | | ✓ | | | | | |
| 82. Upon request, provide information about the radiation health and safety program to Core ER representatives when they visit the region to perform annual health and safety audits. | ✓ | | ✓ | | ✓ | ✓ | | |
| Tasks and Activities Typically Assigned to Emergency Responders | | | | | | | | |
| 83. Ensure the safety of all onsite personnel working in the field. | | | | | | ✓ | | |
| 84. Attend a BRST course and achieve a score of at least 80 percent on the associated exam. | | | | | | ✓ | | |
| 85. Attend an ARST course and achieve a score of at least 80 percent on the associated exam. | | | | | | ✓ | | |
| 86. Attend radiation-safety refresher courses at least once every 2 years, and achieve at least 80 percent on the associated exams. | | | | | | ✓ | | |
| 87. Maintain copies of training certificates and keep them in an accessible location so that they can be carried into the field during assignment. | | | | | | ✓ | | |
| 88. Working with your Removal Manager, submit a training waiver request to the RSO/SHEMP Manager or another designated person if the following situation applies: (1) an emergency response situation occurs before you have had a chance to complete your formal training requirements, and (2) you feel confident that you possess a thorough understanding of radiation safety considerations even in the absence of formal training. (Note: The name filled in the blank should match the name that is checked off for task #21.) | | | | | | ✓ | | |
| 89. Enroll in EPA's Personnel Monitoring Program. | | | | | | ✓ | | |
| 90. Attend a training session on how to use TLD badges. | | | | | | ✓ | | |
| 91. Wear TLD badges at sites where there is a potential for exposure to ionizing radiation. | | | | | | ✓ | | |
| 92. Unless otherwise specified, exchange TLD badges on a | | | | | | ✓ | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|--------|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | (Name) | (Name) | (Names) | (Names) | (Name) | (Name) |
| calendar-quarterly basis. | | | | | | | | |
| 93. Place TLDs in designated storage locations at end of your shift. | | | | | | ✓ | | |
| 94. Notify the RSO/SHEMP Manager or another designated person immediately if your TLD has been exposed to non-occupational radiation sources or if you suspect that the TLD has been lost, damaged, or compromised. (Note: The name filled in the blank should match the name that is checked off for task #29.) | | | | | | ✓ | | |
| 95. Wear SRD devices at sites where there is a potential for exposure to ionizing radiation. | | | | | | ✓ | | |
| 96. Fill out SRD Exposure Record Cards at the beginning and end of each shift, and submit the cards to the RSO/SHEMP Manager or another designated person at the end of each incident response, or at least quarterly. (Note: The name filled in the blank should match the name that is checked off for task #52.) | | | | | | ✓ | | |
| 97. Notify the RSO/SHEMP Manager or another designated person immediately if: <ul style="list-style-type: none"> ■ Your whole body H(10) alarm sounds or if radiation detection levels are detected at 1 mrem/hour. ■ You have reached a one-time shift dose limit of 50 mrem, or ■ You have reached a dose limit of 50 mrem over several shifts. | | | | | | ✓ | | |
| 98. Turn damaged SRDs into the RSO/SHEMP Manager or another designated person for maintenance. (Note: The name filled in the blank should match the name that is checked off for task #35.) | | | | | | ✓ | | |
| 99. Wear special dosimeters, such as extremity TLDs, neutron dosimeters, or alpha dosimeters, if the RSO/SHEMP Manager or another designated person has instructed you to do so. Keep copies of any site-specific dosimetry reports that are generated using these devices and submit these reports to the RSO/SHEMP Manager or another designated person . (Note: The names filled in these blanks should match the names checked off for task #31 and task #52.) | | | | | | ✓ | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|--|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| <p>100. Notify your direct supervisor and the RSO/SHEMP Manager or other designated person if you know (or suspect) that you have been exposed to radiation. Also, fill out: (1) Cover Memo to EPA Form 1440-9, "Supervisor's Report of Accident/Illness," and (2) EPA Form 1440-9, "Supervisor's Report of Accident/Illness." (See Appendix I) Submit these forms to your direct supervisor. In addition, consult the RSO/SHEMP Manager or another designated person for advice and to determine whether you need follow-up medical evaluation, treatment, or time off of work. (Note: The names filled in these blanks should match the names checked off for task #53 and task #54.)</p> | | | | | | ✓ | | |
| <p>101. Communicate with your Removal Manager and the RSO/SHEMP Manager or another designated person about modifying your duties or implementing protective measures if dosimetry data suggest that you've exceeded the Agency's ARL (i.e., 50 mrem per quarter) or ACL (i.e., 500 mrem per year). (Note: The names filled in these blanks should match the name checked off for task #41.)</p> | | | | | | ✓ | | |
| <p>102. Obtain information about situations where workers are allowed to temporarily exceed the Agency's Administrative Dose Limits, and do the following if you wish to participate in:</p> <ul style="list-style-type: none"> ■ <i>Planned Special Exposures.</i> Submit a formal request in writing to RSO/SHEMP Manager or another designated person. ■ <i>Emergency operations.</i> If possible, consult with the RSO/SHEMP Manager or another designated person before entering an environment where you could be exposed to doses greater than the Agency's ACL of 500 mrem. If the nature of the emergency makes it impossible to receive pre-approval, contact the RSO/SHEMP Manager or another designated person to notify him or her of what you have been exposed to as soon after the incident as is possible to do so. (Note: The names filled in these blanks should match the names checked off for task #42.) | | | | | | ✓ | | |

| ROLES ▶ | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|---------------|----|--------------------------------|-----------------------------------|------------------------------|-------------|---|
| | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| <p>103. If you are pregnant, decide whether you want to declare your pregnancy to your employer. If so, do the following:</p> <ul style="list-style-type: none"> ■ Submit a written declaration to the RSO/SHEMP Manager or another designated person. (Note: See Appendix H.) ■ Coordinate with your Removal Manager and the RSO/SHEMP Manager or another designated person to: (1) discuss extra precautionary measures that should be taken to protect the embryo/fetus, and (2) determine whether it is necessary to modify your job functions during your pregnancy. (Note: The names filled in the blank should match the names checked off for task #46.) | | | | | | ✓ | | |
| <p>104. Communicate with the RSO/SHEMP Manager or another designated person about whether it is necessary to develop an internal monitoring plan. (Note: The name filled in the blank should match the name checked off for task #47.)</p> | | | | | | ✓ | | |
| <p>105. Complete the "Exposure, Injury, and Dosimetry Tracking Form" (see Appendix I) and submit it to the RSO/SHEMP Manager or another designated person on a quarterly basis. (Note: The name filled in the blank should match the name checked off for task #52.)</p> | | | | | | ✓ | | |
| <p>106. Attend training sessions that provide information on the proper use of radiation-detection equipment.</p> | | | | | | ✓ | | |
| <p>107. When in the field, take responsibility for the storage and security of equipment that contains radioactive sources. Communicate all site-specific storage and security requirements to the RSO/SHEMP Manager or another designated person.</p> | | | | | | ✓ | | |
| <p>108. Notify the RSO/SHEMP Manager or another designated person immediately if any equipment containing radioactive sources becomes damaged, lost, or stolen while working in the field.</p> | | | | | | ✓ | | |
| <p>109. Consult with the RSO/SHEMP Manager or another designated person to find out what paperwork is needed before attempting to transport equipment that contains radioactive materials. (Note: The name filled in the blank should match the name checked off for task #74 and task #75.)</p> | | | | | | ✓ | | |

| | Who is Responsible for Each Task or Action? | | | | | | | |
|---|---|------------------|----|---|--------------------------------------|------------------------------------|-------------|---|
| ROLES ▶ | Removal Manager | SHEMP Manager | OR | Radiation Safety Officer (RSO) | Health and Safety Program Contact | Emergency Response Personnel | Supervisors | Other individuals with specially designated responsibilities (EPA employees, contractors, etc.) |
| Name of person in role ▶ | (Name) | (Name) | | (Name) | (Name) | (Names) | (Names) | (Name) (Name) |
| 110. Provide information related to radiation-safety procedures to auditors upon request. | | | | | | ✓ | | |

APPENDIX B:
Checklist for Emergency Response Personnel

Background Information/Instructions:

This appendix provides informational sheets that are designed to give emergency responders a quick overview of their Region's Radiation Health and Safety Program. The two pages that follow provide information on:

- Items that emergency responders should address *before* going into the field, and
- Information that emergency responders need to know when they are *in* the field.

This appendix also has some blank lines (highlighted in yellow) that need to be filled. Once the appropriate names have been filled into the blanks, the two informational sheets can be printed on one front-and-back page, laminated, and taken to the field.

Checklist for EPA's Emergency Responders

Region : Radiation Health and Safety Program

Part I: Getting Prepared—What Do You Need to Do Before Going Into the Field?

1. Have you attended (and passed) a Basic Radiation Safety Training course? Yes__ No__
2. Have you attended (and passed) an Advanced Radiation Safety Training course? Yes__ No__
3. Do you attend (and pass) radiation safety refresher courses at least once every 2 years? Yes__ No__
4. Have you received training on the proper use of radiation-detection equipment? Yes__ No__
5. Do you have copies of all of your training certificates, and do you maintain these certificates in an accessible location so that you can bring them with you when you are sent into the field? Yes__ No__
6. Have you enrolled in EPA's Personnel Monitoring Program? Yes__ No__
7. Have you been issued a thermoluminescent dosimeter (TLD) badge? Yes__ No__
8. Have you received training on how to use your TLD badge? Yes__ No__
9. Have you been issued a self-reading dosimetry (SRD) device? Yes__ No__
10. Have you received instructions on how to use SRDs and how to fill out Exposure Record Cards? Yes__ No__
11. *Addressing dosimetry data:*
 - Have you been informed of the Agency's Action Reference Level (ARL) and Administrative Control Level (ACL)? Yes__ No__
 - If dosimetry data suggest that you have exceeded the Agency's ARL (50 mRem per quarter) or ACL (500 mRem per year), have you talked to your Removal Manager and _RSO/SHEMP Manager (or another designated person)_ about temporarily modifying your job activities? Yes__ No__
12. *Exceeding the Agency's ACL of 500 mRem:*
 - Have you received information on the scenarios (i.e., planned special exposures and emergency operations) for which it is acceptable to exceed the Agency's ACL? Yes__ No__
 - If you are trying to obtain permission to participate in a planned-special-exposure event, have you submitted a written request to _your RSO/SHEMP Manager (or another designated person)_? Yes__ No__
 - Have you been informed of the risks and potential health effects associated with exposure levels that exceed the Agency's ACL? Yes__ No__
13. If you are pregnant, have you:
 - Reviewed NRC Guide 8.13 "Instructions Concerning Prenatal Radiation Exposure?" Yes__ No__
 - Declared your pregnancy in writing? (*This is optional.*) Yes__ No__
 - Been issued a TLD badge for the embryo/fetus? Yes__ No__
 - Talked with your Removal Manager and _your RSO/SHEMP Manager (or another designated person)_ about whether your job functions should be temporarily modified? Yes__ No__
14. Have you talked to _your RSO/SHEMP Manager (or another designated person)_ about whether it is necessary to develop an internal monitoring plan? Yes__ No__
15. If you plan to transport equipment that contains a radioactive source, have you asked _your RSO/SHEMP Manager (or another designated person)_ to find out what kind of paperwork should accompany the equipment? Yes__ No__

Information for EPA's Emergency Responders

Region [REDACTED]: Radiation Health and Safety Program

Part II: Things You Need to Know in the Field

TLD Badges:

- TLD badges must be worn at sites where there is a potential for exposure to ionizing radiation.
- TLDs are assigned to specific users. It is not acceptable to share your device with a fellow employee.
- TLDs should be worn outside personal protective clothing, between the neck and waist.
- TLD badges must be exchanged on at least a calendar-quarterly basis.
- If you have declared that you are pregnant, you must wear an additional TLD badge for the embryo/fetus. (This TLD should be worn on your abdomen and exchanged on a monthly basis.)
- When your shift is over, store your TLD in a low-radiation area and in a location where the badge will not be exposed to elevated temperatures, light, or moisture.
- TLDs should never be deliberately exposed to radiation or exposed to non-occupational sources of radiation.
- Notify **your RSO/SHEMP Manager (or another designated person)** immediately if your TLD badge has been lost, damaged, or exposed to non-occupational sources of radiation.

SRD Devices:

- SRD devices must be worn at sites where there is a potential for exposure to ionizing radiation.
- Notify **your RSO/SHEMP Manager (or another designated person)** immediately if:
 - Your whole body H(10) alarm sounds (e.g., if radiation levels are detected at 1 mrem/hour)
 - You have reached a one-time shift dose limit of 50 mRem,
 - You have reached a dose limit of 50 mRem over several shifts.

What to do in the event of exposure:

- If dosimetry data suggest that you have exceeded the Agency's ARL (50 mRem per quarter) or ACL (500 mRem per year), communicate with your Removal Manager and **your RSO/SHEMP Manager (or another designated person)** about modifying your duties and/or implementing special protective measures.
- Notify your direct supervisor immediately if you know (or suspect) that you have been exposed to radiation. In such cases, you must also submit: (1) Cover Memo to EPA Form 1440-9, "Supervisor's Report of Accident/Illness," and (2) EPA Form 1440-9, "Supervisor's Report of Accident/Illness."

Situations where EPA allows workers to exceed the Agency's Administrative Dose Limits:

- Planned special exposure. You may ask for permission to temporarily exceed the Agency's ACL if doing so will allow you to complete a long-term site project. Requests must be submitted in writing. Official approval must be granted before any planned special exposure is allowed to occur.
- Emergency operations. EPA workers may perform a variety of emergency response activities that could result in exposure doses of up to 5 rem. If efforts are needed to protect major property or human life, even higher exposure levels than 5 rem may be allowed. If at all possible, contact **your RSO/SHEMP Manager (or another designated person)** in advance if you think you might receive a dose greater than the ACL.

Recordkeeping Requirements: On a quarterly basis, complete the "Exposure, Injury, and Dosimetry Tracking Form" and provide copies to **your RSO/SHEMP Manager (or another designated person)**. You must also submit any site-specific dosimetry reports (e.g., Exposure Record Cards) after each incident response, or at least quarterly.

Handling equipment that contains radioactive sources (e.g., gas chromatographs):

- When in the field, you are responsible for the storage and security of this equipment.
- Alert [REDACTED] immediately if this equipment is damaged, lost, or stolen.
- Before returning equipment back to the office, ask **your RSO/SHEMP Manager (or another designated person)** whether any paperwork needs to accompany the equipment.

APPENDIX C:

Appointment Letter for the Health and Safety Program Contact



**U.S. Environmental Protection Agency
Region XX
Street Address
City, State and Zip Code**

Month XX, 200X

MEMORANDUM

SUBJECT: Appointing a Health and Safety Program Contact

FROM: _____, Director
Preparedness Assessment and Emergency Response Program

TO: Region ____ On-Scene Coordinators (OSCs)

In an effort to improve overall health and safety awareness and readiness of the Region ____ Emergency Response Program, I have appointed _____ as the Health and Safety Program Contact. My intent of appointing a Health and Safety Program Contact is to create a single point-of-contact (POC) for all health and safety issues, including emergency response radiation issues.

The Health and Safety Program Contact will be responsible for coordinating with the Region ____ Radiation Safety Officer (RSO), Safety Health and Environmental Management Program (SHEMP) Manager, the Removal Manager, and emergency response personnel to ensure the Region ____ Emergency Response Program is in compliance with all current health and safety regulations. The creation of a Health and Safety Program Contact will in no way effect the regional responsibilities of the RSO or SHEMP Manager. The Health and Safety Program Contact should improve the effectiveness of the programs established by the RSO and SHEMP Manager by providing a consistent POC within the Emergency Response Program. OSCs working within the Region ____ Emergency Response Program should also use the Health and Safety Program Contact to initiate modifications to health and safety policies.

APPENDIX D:
Training Certification Letter



U.S. Environmental Protection Agency (EPA)
Region XX
Street Address
City, State and Zip Code

Month XX, 200X

SUBJECT: Radiation Health and Safety Training Documentation

FROM: _____, (RSO/SHEMP Manager or other designated position)

TO: _____, (EPA emergency responder)

_____, (Removal Manager)

_____, (Region ____ Health and Safety Program Contact)

_____, (Other applicable stakeholders)

EPA's Safety, Health and Environmental Management (SHEM) Guide No. 38 requires emergency response personnel to participate in radiation health and safety training. In order to meet the training requirements, EPA personnel must participate in training courses, take examinations, and attain a score of 80 percent or higher on the associated examinations.

Please be advised that _____ (Name of EPA employee) has met the requirements for the following radiation health and safety training level:

_____ **Basic Radiation Safety Training Course**

- Name of the course: _____.
- Location of the course: _____.
- Date the course was taken: _____.
- Did the employee receive a score of 80 percent or higher on EPA's Basic Radiation Safety Training Course Examination? Yes____ No____. If "no," did the employee review the test questions and course materials with his or her manager and subsequently demonstrate an adequate understanding of the course material? Yes____ No____.

_____ **Advanced Radiation Safety Training Course**

- Name of the course: _____.
- Location of the course: _____.
- Date the course was taken: _____.
- Did the employee receive a score of 80 percent or higher on the associated examination? Yes____ No____. If "no," did the employee review the test questions and course materials with his or her manager and subsequently demonstrate an adequate understanding of the course material? Yes____ No____.

_____ **Refresher Radiation Health and Safety Training Course**

- Name of the course: _____.
- Location of the course: _____.
- Date the course was taken: _____.
- Did the employee receive a score of 80 percent or higher on the associated examination? Yes____ No____. If "no," did the employee review the test questions and course materials with his or her manager and subsequently demonstrate an adequate understanding of the course material? Yes____ No____.

APPENDIX E:

Training Waiver

U.S. Environmental Protection Agency (EPA)
Region XX
Street Address
City, State and Zip Code

Month XX, 200X

SUBJECT: Incident-Specific Training Waivers

FROM: _____, (RSO/SHEMP Manager or other designated position)

TO: _____, (Removal Manager)

In the event of activation of either the *Federal Radiological Emergency Response Plan* or the *EPA Radiological Emergency Response Plan*, incident-specific special waivers of formal Safety, Health and Environmental Management (SHEM) Guide 38 radiation health and safety training requirements may be granted.

I (Name/Title) am granting a temporary training waiver to (Name of EPA employee) to allow this individual to perform activities at a site that has the potential for radiation exposure even though he/she has not completed EPA's official radiation health and safety training requirements yet. Although the training requirements have not been met, this employee has demonstrated sufficient knowledge about radiation hazards and the measures that should be taken to minimize these hazards. The employee is deemed proficient in these areas because:

[illegible]

This training waiver will be in effect between _____ and _____.

(Signature of the RSO/SHEMP Manager or other designated position)

(Date) _____

APPENDIX F:

Paperwork Required To Enroll in the Personnel Monitoring Program

TLD ENROLLMENT REQUEST FORM

| | |
|--|---|
| ENROLLMENT CLASS | <input type="checkbox"/> Permanent (OSC, RPM, Em.Resp, Radiation Program) <input type="checkbox"/> Temporary (XRF) Date Issued <input style="width: 100px;" type="text"/> Date Returned <input style="width: 100px;" type="text"/> |
| NAME: | |
| SOCIAL SECURITY NUMBER: | |
| DATE OF BIRTH: | |
| GENDER: | |
| MAIL CODE: | |
| EXTENSION: | |
| PREVIOUS EXPOSURE HISTORY: (See Attached) | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| PURPOSE | |

For Radiation Safety Office
use Only:

Change in Service form: ☐Y ☐N
 Training Needed: ☐Y ☐N
 Date Training Completed:
 Extra Badge Assigned: ☐Y ☐N
 If Yes, Badge Number:

AUTHORIZATION FOR RELEASE OF
OCCUPATIONAL RADIATION EXPOSURE INFORMATION

INSTRUCTIONS: Complete this form, sign it, and return it as requested. If your answer to #2 is "NO," skip items #3, #4, and #5, and go directly to #6. If you have participated in more than one employer's radiation program, please complete and sign a separate form for each previous employer. **Be sure to sign each form since some employers will accept only release authorizations bearing "original" signatures.**

1. My name is: _____
(Print your full name)

2. _____ YES, I have . . .

_____ NO, I have not . . .

. . . been monitored for occupational exposure to ionizing radiation by a former employer, prior to working at EPA.

3. My former employer who monitored me for radiation exposure was:

(print the name of the former employing organization)

(print the street number and street address)

(print the city, state, and zip code)

() _____
(area code and **main** telephone number of employer)

DATES OF THIS EMPLOYMENT: from _____ / _____ to _____ / _____
(mo) (yr) (mo) (yr)

4. I HEREBY _____ DO . . .
_____ DO NOT . . .

. . . REQUEST AND AUTHORIZE THE RELEASE OF MY RADIATION EXPOSURE RECORDS TO EPA BY THE ORGANIZATION NAMED IN PARA. 3 ABOVE.

5. By completion of this section, I hereby consent to the use of my social security number and my date of birth in obtaining, and verifying, my radiation exposure monitoring records.

MY SOCIAL SECURITY NO. IS: _____ - _____ - _____.

MY DATE OF BIRTH IS: _____ / _____ / _____.
(mo) (day) (yr)

MY BIRTHPLACE IS: _____.

6. SIGNATURE: _____ (original signature)

APPENDIX G:
Sample Exposure Record Card

INDIVIDUAL RADIATION EXPOSURE RECORD

NAME _____

SITE/EVENT _____

WORK ADDRESS _____

Record readings at the beginning and at the end of each shift.

WORK PHONE _____

Notify your **RSO/SEMP Manager or another designated person** immediately if:

HOME ADDRESS _____

1. Your dosimeter dose or dose rate alarms sound, or
2. If you have reached a one-time shift dose limit of 50 mRem, or
3. If you have reached a dose limit of 50 mRem over several shifts.

HOME PHONE _____

SSN _____

DATE OF BIRTH _____

Doses of 500 mRem or higher must be authorized by the Radiation Safety Officer, Safety, Health and Environmental Manager, and your supervisor.

ORGANIZATION _____

TODAY'S DATE/TIME _____

Return this card to your **RSO/SEMP Manager or another designated person**.

DIRECT-READING DOSIMETER
SERIAL NUMBER: _____

TLD SERIAL NUMBER: _____

| Date | Shift StartTime/ Shift End Time | Beginning of Shift Reading | End of Shift Reading | Shift Dose (End of Shift - Beginning of Shift) | Did any alarms sound? Y/N Dose/Dose Rate (if yes, indicate which) |
|------|------------------------------------|-------------------------------|-------------------------|---|--|
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

APPENDIX H:
Memorandum for Declaration of Pregnancy

MEMORANDUM

SUBJECT: DECLARATION OF PREGNANCY

FROM: _____

TO: _____

In accordance with the NRC's regulations at 10 CFR 20.1208, "Dose to an Embryo/Fetus," I am declaring that I am pregnant. I believe I became pregnant in _____ (month and year).

I understand the radiation dose to my embryo/fetus during my entire pregnancy will not be allowed to exceed 0.5 rem (500 mrem). I also understand that meeting the lower dose limit may require a change in job or job responsibilities during my pregnancy. These changes will be coordinated with the Radiation Safety Officer and my supervisor.

I understand that I will be placed on a monthly dosimeter exchange cycle to ensure compliance to the administrative exposure limit.

Once the pregnancy is concluded, or at such time as I wish to revoke my pregnancy declaration, I shall notify you in writing, so I can resume my normal duties. If I fail to withdraw this declaration at the conclusion of my pregnancy, I understand that this submittal will expire one year after the submission date.

Employee Signature

Employee Printed Name

Date

APPENDIX I:
Exposure, Injury, and Dosimetry Tracking Form

Exposure, Injury, and Dosimetry Tracking Form

Date: _____

Participant: _____
(Name) (Signature)

This report provides information related to activities performed between _____ and _____.
(mo/day/yr) (mo/day/yr)

I. During this reporting period, did you work at a job site where oil or hazardous substances/contaminants, including sources of ionizing radiation, were or may have been present? ☐ Yes ☐ No

If yes, please provide details for each trip:

| Site Name and Location | SSID (Site ID) | Dates Present On Site | Specific Chemical and Potential Routes of Exposure (and concentrations if known) | Level(s) of PPE Used | EPA TLD (dosimeter) Worn? |
|------------------------|----------------|-----------------------|--|----------------------|---|
| | | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No |

II. Did you receive an on-the-job exposure to radiation or any chemical during this reporting period?

☐ Yes ☐ No ☐ Unknown

If Yes, indicate date of exposure __/__/__, and date cover memo and draft EPA Form 1440-9, "Supervisor's Report of Accident/Illness" was submitted to Supervisor __/__/__.

III. Were you injured on the job or did you experience a job-related illness during this reporting period?

☐ Yes ☐ No ☐ Unknown

If Yes, indicate date of injury/illness __/__/__, and date cover memo and draft EPA Form 1440-9, "Supervisor's Report of Accident/Illness" was submitted to Supervisor __/__/__.

RSO/SHEMP Manager: _____ Date Received: _____
(Name) (Signature) (mo/day/yr)

APPENDIX J:
Forms Needed to Report an Accident Or Illness



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Date: _____

MEMORANDUM

Subject: Cover Memo for EPA Form 1440-9, "Supervisor's Report of Accident/Illness"

To: _____
(Supervisor)

From: _____
(Injured or Exposed Employee)

Enclosed, please find a draft copy of EPA Form 1440-9, "Supervisor's Report of Accident/Illness." I have completed applicable information relative to my exposure or injury. Please process this form as follows:

- ☐ No lost work-time or medical treatment has occurred as a result of my exposure or injury. (I may request additional processing at a later date if my condition changes.)
- ☐ As part of the Region's Occupational Medical Surveillance Program, I would like to receive a medical consultation to evaluate potential health effects and treatment options as a result of my known or potential exposure to oil or hazardous substances/ contaminants.

Sample of EPA Form 1440-9

| SUPERVISOR'S REPORT OF ACCIDENT/ILLNESS (1146-DOL-XX) | | |
|---|-----------------------------|---|
| MAIL TO: EPA Headquarters Occupational Health and Safety Staff Management Information Systems (PM-273) Washington, DC 20460 | | RETURN MAILING ADDRESS |
| | | TELEPHONE (FTS) |
| | | AGENCY ORG CODE |
| INSTRUCTIONS: Detach top copy of this five-part form and mail to the above address. Route other parts of this form as indicated on each part. See Chapter 3 of the EPA Occupational Health and Safety Manual for more detailed instructions. This form is to be completed and mailed within two (2) work days of your being notified. | | |
| NAME OF INJURED OR ILL EMPLOYEE | | JOB TITLE/SERIES/GRADE |
| DATE OF ACCIDENT | TIME OF ACCIDENT | EXACT LOCATION OF ACCIDENT |
| INJURY OR ILLNESS AND PART(S) OF BODY INVOLVED (e.g., fractured left leg, scalded right hand) | | |
| ESTIMATED LENGTH OF MEDICAL TREATMENT (if injury or illness) | | |
| <input type="checkbox"/> FIRST AID ONLY <input type="checkbox"/> _____ DAYS OF RESTRICTED WORK ACTIVITY <input type="checkbox"/> _____ DAYS AWAY FROM WORK | | <input type="checkbox"/> FATAL |
| GOVERNMENT PROPERTY DAMAGE <input type="checkbox"/> NO <input type="checkbox"/> YES | ESTIMATED DAMAGE COST \$ | APPROPRIATE CA FORMS COMPLETED <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A |
| NARRATIVE DESCRIPTION OF ACCIDENT (Tell what happened and how it happened. Use additional sheets of paper if needed.) | | |
| CORRECTIVE ACTION WHICH HAS BEEN TAKEN | | |
| CORRECTIVE ACTION WHICH REMAINS TO BE TAKEN (By whom and by when) | | |
| NAME OF SUPERVISOR (typed or printed) | | TITLE |
| SIGNATURE OF SUPERVISOR | | DATE |

EPA Form 1440-9 (Rev. 1-82) Previous edition is obsolete.

DISTRIBUTION: White EPA Headquarters
 Green Personnel Officer
 Canary Safety Designee
 Pink Supervisor

APPENDIX K:

**Paperwork Accompanying Transported Exempt
Sources
(Sample Forms from Region 5)**



**United States Environmental Protection Agency
Region 5 Superfund
77 W. Jackson Blvd.
Chicago, Illinois 60604-3590**

Exempt Quantity Sources
Reference: 10 CFR 30.71 Schedule B and 29 CFR 1910.1200(b)(6)(xi)

The exempt quantity sources being shipped by the United States Environmental Protection Agency Region 5 may be procured, handled and used by persons who are exempt from U.S. Nuclear Regulatory Commission Licensing requirements. The radioactive material contained in these sources should be considered the principal hazard and is beyond the scope of the Material Safety Data Sheets requirements of 29 CFR 1910.1200 (OSHA)

The sources are not for human use. Introduction into foods, beverages, cosmetics, drugs, medicinals, or into products manufactured for commercial distribution is prohibited. Exempt quantities should not be combined.

The following are suggested safety and handling procedures, local procedures and regulations may supersede them.

Handling- Radioactive Material require proper handling techniques and safety precautions. The amount of radiation given off by this source is so low it presents no significant hazard, they should be handled with respect. Controlling exposure is best done by increasing distance from the source, reducing time spent near a source, and using shielding.

Use- These sources are solely used for performance checks of instruments that measure radioactivity.

Storage- These sources have no special storage requirements.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 5
Superfund Division
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

**THIS PACKAGE CONFORMS TO THE
CONDITIONS AND LIMITATIONS
SPECIFIED IN TITLE 49, PART 173.421
(49 CFR 173.421)
FOR RADIOACTIVE MATERIAL,
EXCEPTED PACKAGE-LIMITED
QUANTITY OF MATERIAL,
UN2910**

Contacts:

Linda Nachowicz, Chief
Emergency Response Section III
(312)-886-6337

Jim Mitchell, Health Physicist
Emergency Response Section III
(312)353-9537

APPENDIX L:
Radiation Health and Safety Program Audit Form

RADIATION HEALTH AND SAFETY PROGRAM AUDIT FORM

Date of Review: _____

Name of Reviewer: _____ Phone number: _____

| REVIEW CRITERIA | COMPLIANT | | |
|---|--------------------------|--------------------------|--------------------------|
| | Yes | No | N/A |
| General | | | |
| REGIONAL ESTABLISHMENT OF IMPLEMENTATION PLAN: | | | |
| 1. Removal Manager, Health and Safety Program Contact, RSO/SHEMP Manager, and other relevant stakeholders have met to discuss the <i>Radiation Health and Safety Implementation Plan</i> , and have assigned roles and responsibilities to specific individuals. The plan has been adopted as an implementation strategy by all stakeholders (see Section 1.3). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Biannual meetings are held and all involved personnel are aware of their role in implementing the Program (see Section 1.3) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Radiation Safety Training | | | |
| TRAINING REQUIREMENTS (see Sections 5.1 , 5.1.1 , 5.1.2 , and 5.1.3): | | | |
| 3. Basic Radiation Safety Training is provided to each worker before, or at the time of, enrollment into the Radiation Health & Safety Protection Program. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Basic Radiation Safety Training examinations are provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Advanced Radiation Safety Training is provided to workers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Advanced Radiation Safety Training examinations are provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Refresher training is provided. (OSCs and other emergency response personnel shall take a refresher course once every two years.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Refresher training examinations are provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. All current emergency response personnel meet advanced training requirements within one year of adopting this <i>Radiation Health and Safety Implementation Plan</i> . | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| TRAINING RECORDS (see Section 5.2): | | | |
| 10. Training certificates are issued to document whether an employee has succeeded in obtaining specific training requirements. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Radiation health and safety training documentation is maintained in a permanent repository available to the Removal Manager, the RSO/SHEMP Manager, the Health and Safety Program Contact, and emergency response personnel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| REVIEW CRITERIA | COMPLIANT | | |
|---|--------------------------|--------------------------|--------------------------|
| | Yes | No | N/A |
| 12. Training requirements are tracked and reminders of upcoming training events are sent. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| TRAINING WAIVERS (see Section 5.3): | | | |
| 13. In the event of activation of either the Federal Radiological Emergency Response Plan or the EPA Radiological Emergency Response Plan, training waivers are issued if necessary and maintained as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Personnel Monitoring | | | |
| ENROLLMENT (see Section 6.1): | | | |
| 14. All OSCs and other emergency response personnel are enrolled in the personnel monitoring program. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. All OSCs and other emergency response personnel have signed releases for obtaining exposure records from previous employers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. A process for baseline and exit radionuclide-specific analysis has been established. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| EXTERNAL EXPOSURE MONITORING: | | | |
| <i>TLD PROGRAM:</i> | | | |
| 17. OSCs and other emergency response personnel receive TLD badge training (see Section 6.2.1.1). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. TLD Badges are returned at the end of the monitoring period (see Section 6.2.1.1). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. TLD usage, exchange, and storage procedures are established (see Section 6.2.1.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Processes are established to address broken, lost, or contaminated badges (see Section 6.2.1.3). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>SPECIAL DOSIMETERS:</i> | | | |
| 21. Special dosimeters are made available to emergency response personnel as needed (see Section 6.2.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>SRD PROGRAM (see Section 6.2.3):</i> | | | |
| 22. SRDs are issued to emergency response personnel who are enrolled in the TLD program and who have passed the Basic Radiation Safety Training examination. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Exposure Record Cards are distributed with SRDs. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Any alarm or exceedance of Action Reference Level is reported to the RSO/SHEMP Manager or _____. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| REVIEW CRITERIA | COMPLIANT | | |
|---|--------------------------|--------------------------|--------------------------|
| | Yes | No | N/A |
| 25. At a minimum, emergency response personnel return Exposure Record Cards quarterly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Processes are established to address lost or damaged SRDs. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. SRDs are calibrated annually. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Dose alarms are set by the RSO/SHEMP Manager or _____. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>RESPONDING TO THE DOSIMETRY DATA —ADDRESSING DOSE LIMITS:</i> | | | |
| 29. Emergency response personnel and their supervisors are notified of exposures exceeding an ARL of 50 mrem/quarter. Follow-up steps are taken (see Section 6.2.4.1). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. An employee's work assignment schedule is modified if he or she reaches an ACL of 500 mrem committed effective dose equivalent (see Section 6.2.4.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Workers consult their supervisors, RSOs/SHEMP Managers or _____ if they think they might participate in activities that could exceed EPA's ACL (see Section 6.2.4.3). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>PREGNANT WORKERS AND EMBRYO/FETUS CONCERNS (see Sections 6.2.5, 6.2.5.1, 6.2.5.2, and 6.2.5.3):</i> | | | |
| 32. Female emergency response personnel are given a copy of NRC Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure." | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Two TLDs are assigned to declared pregnant workers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Maximum permissible exposure during the entire gestation period of 500 mrem is met. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Lower dose limits and monthly monitoring is conducted for pregnant workers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| INTERNAL EXPOSURE MONITORING (see Section 6.3): | | | |
| 36. Internal monitoring plans are established for workers who have a known exposure or who are working in a known radiation environment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| REPORTING, NOTIFICATION AND RECORDKEEPING REQUIREMENTS: | | | |
| <i>DOSIMETRY RECORDS AND NOTIFICATION (see Section 6.4.1):</i> | | | |
| 37. All quarterly dosimetry reports are provided to emergency response personnel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. All annual dosimetry reports are provided to emergency response personnel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| REVIEW CRITERIA | COMPLIANT | | |
|---|--------------------------|--------------------------|--------------------------|
| | Yes | No | N/A |
| <i>RECORDING OCCUPATIONAL EXPOSURES</i> (see Section 6.4.2): | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Workers complete “Exposure, Injury, and Dosimetry Tracking Form” on a quarterly basis. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Workers who receive any type of occupational exposure notify their supervisor and submit the required forms. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Follow-up care and/or worker’s compensation process is initiated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Using and Maintaining Radiation Detection Equipment | | | |
| 42. Training is provided to workers on the proper use of radiation-detection instrumentation at least once every 2 years. (see Section 7.1). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. A list of radiation-detection equipment (with information on calibration and maintenance schedules) is maintained (see Section 7.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Radiation-detection equipment is calibrated and maintained according to the list. Supporting documentation is provided (see Section 7.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. SOPs are maintained with the instruments (see Section 7.2). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Safe Use of Equipment that Contains Radioactive Sources | | | |
| NRC LICENSE REQUIREMENTS (see Section 8.1): | | | |
| 46. NRC licenses are obtained as appropriate and license requirements are met. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| PURCHASE, STORAGE, AND SECURITY (see Section 8.2): | | | |
| 47. All necessary licenses are obtained as appropriate or met. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Disposal plans are included as part of procurement requests. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Radioactive materials are stored and secured properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| TAKING AN INVENTORY (see Section 8.3): | | | |
| 50. Inventory of region-owned or region-furnished equipment containing radioactive sources is maintained. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. The inventory list is verified on a semi-annual basis. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| PERFORMING LEAK TESTING, WIPE SAMPLES, AND MAINTENANCE ACTIVITIES (see Section 8.4): | | | |
| 52. Leak testing is performed in accordance with licensing requirements. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Maintenance and wipe sampling is performed in accordance with license requirements. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Records of maintenance and wipe samples are stored. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| REVIEW CRITERIA | COMPLIANT | | |
|--|--------------------------|--------------------------|--------------------------|
| | Yes | No | N/A |
| 55. Training and certification requirements are met for equipment that contains radioactive sources. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SHIPPING AND TRANSPORTING EQUIPMENT (see Section 8.5): | | | |
| 56. Guidelines for transportation and notification are developed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Shipping and transportation packages accompany devices. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| DISPOSING OF AND EXCESSING EQUIPMENT (see Section 8.6): | | | |
| 58. Disposal and excessing of equipment is transferred to a qualified licensed entity. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Notice of Findings: