

# Operating Procedures

## I. Training

Proper training is the most important factor contributing to safe handling, transport and use of portable gauging devices.

- A. Prior to handling or operating portable gauging devices, workers shall:
  - 1. Have received radiation awareness instructions as required by the regulatory agency; and
  - 2. (a) Have documentation on file of their completion of a minimum of 8 hours of approved radiation safety training.
  - (b) Work under the supervision and receive hands-on gauge training in the physical presence of individuals who have received the training described above.
- B. Prior to engaging in transportation-related activities (e.g., loading, unloading, preparation for shipment, or transport) workers must complete hazmat employee training as required by the U.S. Department of Transportation in Title 49, Code of Federal Regulations (49 CFR), Part 172, Subpart H.

<p><b>Notes:</b></p> <ul style="list-style-type: none"><li>– There is an initial 90-day grace period whereby individuals may transport portable gauging devices without having completed hazmat employee training, provided they are accompanied by a hazmat-trained worker.</li><li>– Workers must receive refresher hazmat employee training.</li></ul>
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## II. Availability of Procedures

- A. A complete and current copy of the company's operating and emergency procedures must accompany portable gauges at all times.
- B. Copies of the manufacturer's operation/maintenance manual for each device model authorized by the company's license are kept on file by the RSO for ready reference.

## III. Personnel Monitoring

- A. A whole body personnel monitoring (PM) badge (film, TLD or OSLD) must be worn at all times whenever handling, transporting, operating a portable gauging device. Individuals supervising or assisting in the use of portable gauge must wear whole body PM badges.
- B. PM badges are assigned to only one individual and cannot be shared. An assigned badge bears the name of the individual that has been assigned the badge. If a

spare badge is used, it must be marked with the name, initials and/or identification number of the individual using it, and cannot be shared.

- C. PM badges are to be worn at the chest or waist level. Badges cannot be worn during non-occupational radiation exposures (e.g., medical or dental x-rays, etc.).
- D. Do not store PM badges near a gauge; store them in a low background area whenever possible. They must be protected from moisture and extreme environmental conditions such as intense heat or light, or chemicals. Promptly return badges to the Radiation Safety Officer (RSO) for exchange at the required interval.
- E. Immediately notify the RSO if a PM badge is lost or damaged. A record of the worker's estimated dose must be provided to the badge vendor and kept on file. A spare badge will be issued for the remainder of the monitoring period. If a spare badge is used, the dose recorded on the badge must be added to the worker's occupational exposure total by notifying the badge processor.

#### IV. General Rules of Use

- A. **ALARA Philosophy.** All personnel participating in licensed operations must follow the ALARA philosophy – keep radiation exposures As Low As Reasonably Achievable. The objective is to reduce occupational and public exposures as far below regulatory limits as possible by means of good work practices. Apply the following methods to minimize radiation exposures:
  - ◆ Minimize the **TIME** spent in close proximity to the radiation source (the shorter the time, the lower the dose);
  - ◆ Maximize the **DISTANCE** from the radiation source (doubling the distance quarters radiation intensity); and
  - ◆ Make use of available **SHIELDING** to block out radiation.
- B. Use of portable gauging devices, including routine cleaning and maintenance, must be in accordance with the manufacturer's instructions and recommendations.
- C. **Radiation Surveys.** If damage to a portable gauging device appears to have the potential to cause excessive exposures, a radiation detection instrument must be used to measure the radiation levels. If damage is suspected, immediately notify the RSO, who will arrange to have the device surveyed as soon as possible. Refer to the emergency procedures for further instructions.

**Recommendation:**

Portable gauging devices can be made more visible to heavy equipment operators with use of a "stake and flag" at field sites; flags atop fiberglass whips (available at bike shops) will make their presence evident.

- D. Opening or removing sealed sources in portable gauging devices is prohibited, as is direct contact with an unshielded source or placement of hands, fingers, feet or other parts of the body within the radiation field from an unshielded source.
- E. Direct viewing of an open or unshielded radiation source is prohibited. If the source rod or shutter must be inspected, use an inspection mirror to eliminate the need for directly viewing the source.

## V. Security

- A. Each portable gauging device must have a minimum of two independent physical controls that form tangible barriers to secure it from unauthorized removal, whenever it is being transported or stored. While locking the source rod or transport container does serve to restrict immediate access to the radiation source, these measures alone do not constitute the tangible barriers needed to prevent unauthorized removal of the device. Because portable gauging devices stored overnight at temporary job sites are especially vulnerable to theft, where possible, use additional controls (covers, locks, etc.) to enhance security.

**Recommendation:**

Extra precautions can deter thefts, such as concealing gauges from view during transportation and storage, and maintaining an elevated level of awareness in high crime areas.

- B. Before removal from storage, check each portable gauging device to verify that the source is in its shielded position and locked (for models equipped with locking mechanisms), then lock it in the transport case.
- C. After completing each measurement in which the source is unshielded, immediately return the source to the shielded position. Keep the source holder locked in the "off" or closed position whenever the portable gauging device is not in use.
- D. When not in storage, keep the portable gauging device under constant surveillance and immediate control, and keep unauthorized persons away.

**Recommendation:**

Utilization logs can improve accountability when working with multiple gauges by providing a system for tracking dates and locations of use.

## VI. Routine Maintenance

- A. Only authorized users are allowed to perform routine maintenance and cleaning. PM badges must be worn at all times during such activities. A copy of the appropriate manufacturer's operation manual must be on hand, and the maintenance instructions strictly followed. If recommended, use remote handling tools and an inspection mirror as instructed.
- B. Non-routine maintenance or repair that requires removal of the radiation source or source rod is prohibited. Such operations can only be performed by the manufacturer or other specifically authorized persons.