

Foreword

The Department of Energy (DOE) has developed this Standard to assist line managers in meeting their responsibilities for implementing occupational radiological control programs.

DOE has established regulatory requirements for occupational radiation protection in Title 10 of the Code of Federal Regulations, Part 835 (10 CFR 835), *Occupational Radiation Protection*, amended 2007. Failure to comply with these requirements may lead to appropriate enforcement actions as authorized under the Price Anderson Act Amendments (PAAA). While this Standard does not establish requirements, it does restate, paraphrase, or cite many (but not all) of the requirements of 10 CFR 835 and related documents (e.g., occupational safety and health, hazardous materials transportation, and environmental protection standards). Because of the wide range of activities undertaken by DOE and the varying requirements affecting these activities, DOE does not believe that it would be practical or useful to identify and reproduce the entire range of health and safety requirements in this Standard and therefore has not done so. In all cases, DOE cautions the user to review any underlying regulatory and contractual requirements and the primary guidance documents in their original context to ensure that the site program is adequate to ensure continuing compliance with the applicable requirements.

To assist its operating entities in achieving and maintaining compliance with the requirements of 10 CFR 835, DOE has established its primary regulatory guidance in the DOE G 441.1-1C Guide, Radiation Protection Programs Guide for use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection. The Guide is structured to assist radiation protection professionals in developing the documented radiation protection program required by 10 CFR 835.101 and the supporting site- and facility-specific policies, programs, and procedures that are necessary to ensure compliance with the related regulatory requirements. The Guide establishes a macroscopic view of the various elements of a comprehensive radiation protection program and discusses concepts that the cognizant professionals should consider in developing and implementing the site- and facility-specific programs.

This Standard supplements the DOE G 441.1-1C Guide and serves as a secondary source of guidance for achieving compliance with 10 CFR 835. While there is significant overlap between the DOE G 441.1-1C Guide and this Standard, this Standard differs from the Guide in both intent and detail. In contrast to the macroscopic view adopted by the Guide, this Standard discusses specific measures that should be implemented by affected line managers, workers, and support staff to ensure proper fulfillment of their radiological control responsibilities. DOE expects that each site will identify the provisions of this Standard that support its efforts to implement an effective radiological control program and incorporate these provisions, as appropriate, into the site-specific radiological control manual, site procedures, training, or other administrative instruments that are used to guide employee activities. The specific administrative instruments used at DOE sites vary widely, as would be expected given the varying nature of DOE facilities and activities and their associated hazards.

DOE has updated its Radiological Control Standard to reflect the June 8, 2007, amendment to 10 CFR 835. For those sites who have not yet implemented this amendment, the 1999 version of the Radiological Control Standard will continue to be available on the Office of Worker Health and Safety Policy website (<http://www.hss.energy.gov/healthsafety/wshp/radiation/ts.html>) until the 10 CFR 835 implementation date of July 8, 2010.

PART 3 Posting

231 General Posting Provisions

1. Radiological postings are intended to alert individuals to the presence of radiation and radioactive materials and to aid them in controlling exposures and preventing the spread of contamination. Boundaries used for radiological control purposes are depicted in Figure 2-1.
2. Signs shall contain the standard radiation symbol (radiation warning trefoil) colored magenta or black on a yellow background [see 10 CFR 835.601(a)]. Lettering should be either magenta or black. Magenta is the preferred color. Standardized signs, as described in DOE's core training and the 10 CFR 835 Guide, should be used where practicable.
3. Signs shall be conspicuously posted at each access point [see 835.601, 603], clearly worded, and, where appropriate, may include radiological control instructions [see 835.601(b)]. Radiological postings should be displayed only to signify actual or potential radiological conditions. Signs used for training should be clearly marked, such as "For Training Purposes Only."
4. Posted areas should be as small as practicable for efficiency.
5. Postings should be maintained in a legible condition and updated based upon the results of the most recent surveys.
6. If more than one radiological condition (such as contamination and high radiation) exists in the same area, each condition shall be identified [see 835.603].
7. In areas of ongoing work activities, the dose rate and contamination level or range of each should be included on or in conjunction with each posting as applicable.
8. Postings at entrance points to areas of ongoing work activities controlled for radiological purposes should state basic entry requirements, such as dosimetry, radiological work permit (RWP) or other written authorization, and respiratory protection requirements.
9. Rope, tape, chain, and similar barriers used to designate the boundaries of posted areas should be distinctive (e.g., yellow and magenta or yellow and black in color).
10. Physical barriers should be placed so that they are clearly visible from all directions and at various elevations. They should not be easily walked over or under, except at identified access points. These barriers shall be set up such that they do not impede the intended use of emergency exits or evacuation routes [see 835.501(e), 502(d)].
11. Areas shall be clearly and conspicuously posted [see 835.601(b)]. Posting of doors should be such that the postings remain visible when doors are open or closed.
12. A radiological posting that signifies the presence of an intermittent radiological condition should include a statement specifying when the radiation is present, such as "CAUTION: RADIATION AREA WHEN RED LIGHT IS ON."

13. Accessible areas may be excepted from the radiological area posting requirements:
- a. During transient radiological conditions of less than 8 continuous hours duration when posting is not practical, such as radioactive material transfers. Under these conditions, the area shall be placed under the continuous observation and control of individuals who are knowledgeable of and empowered to implement required access and exposure control measures [see 835.604(a)]. These individuals should be stationed to provide line of sight surveillance and verbal warnings.
 - b. When the area contains only packages of radioactive material received from transportation while awaiting survey in accordance with Articles 552 and 554 [see 835.604(c)].

The exceptions discussed above apply only to radiological area and radioactive material area posting requirements and do not apply to the entry control requirements established in 10 CFR 835.501 and 835.502.

232 Posting Radiologically Controlled Areas

Radiologically controlled areas are established and posted to warn individuals that they are entering areas controlled for radiation protection purposes. Individuals who enter only the controlled area without entering radiological areas or radioactive material areas are not expected to receive a total effective dose exceeding 100 millirem in a year.

1. Each access point to a radiologically controlled area shall be posted whenever radiological areas or radioactive material areas may be present in the area [see 835.602(a)].
2. The contractor may select the type of sign used to avoid conflict with local security requirements [see 835.602(b)]. This selection should be approved by the contractor senior site executive.

233 Posting Radiological Buffer Areas

Radiological buffer areas are intended to provide boundaries to minimize the spread of contamination and to limit doses to general employees who have not been trained as radiological workers.

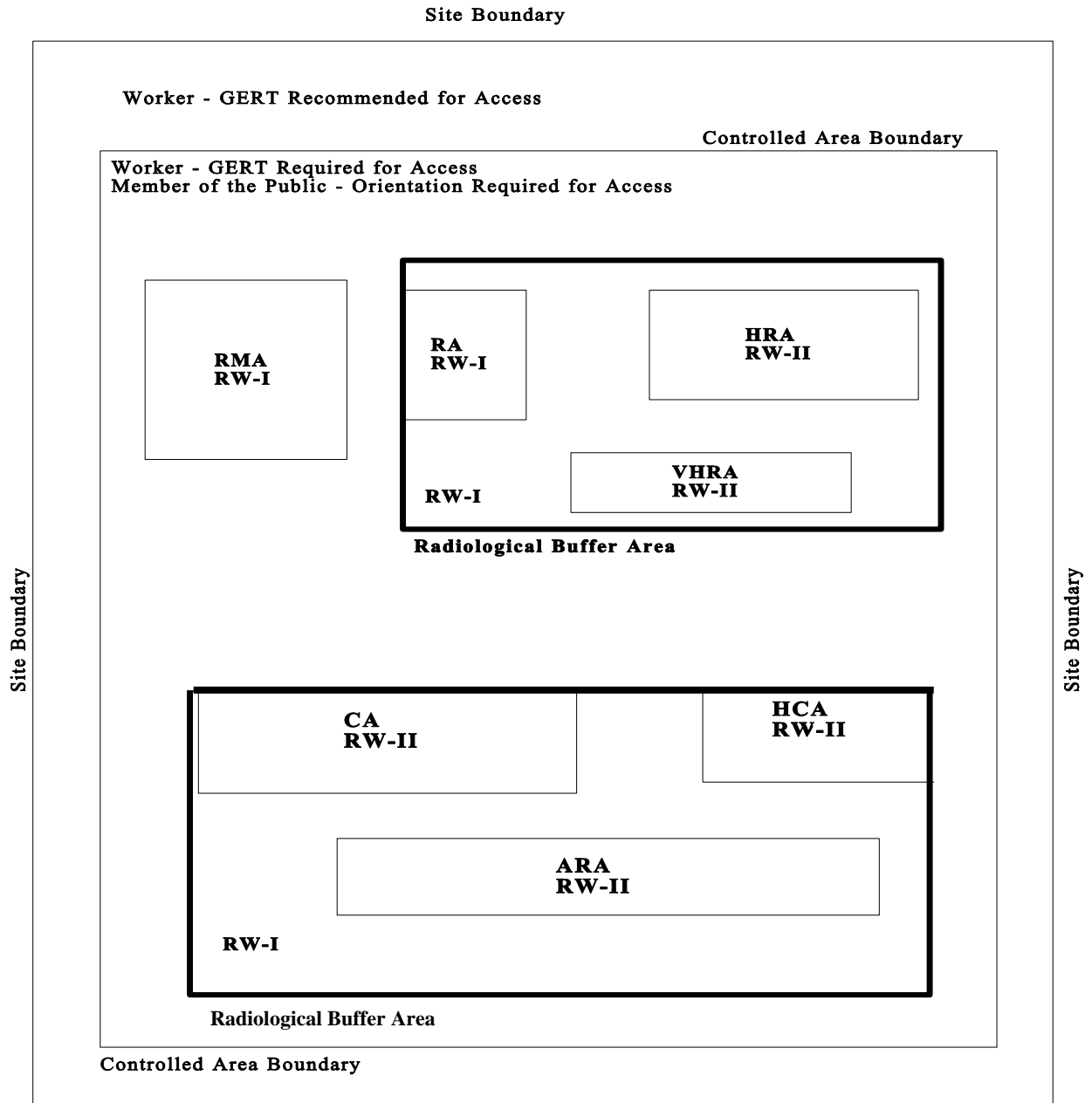
1. A radiological buffer area should be established for contamination control adjacent to any entrance to or exit from a contamination, high contamination, or airborne radioactivity area. The size of the radiological buffer area should be commensurate with the potential for the spread of contamination. A radiological buffer area may also be established in areas such as Change Rooms, where low-level contamination may be present, but where radioactive material handling is not specifically authorized.
2. A radiological buffer area should be established as needed for exposure control. The boundary for the radiological buffer area should be established to limit radiation doses (TED) to general employees to less than 100 millirem per year. The boundary for the radiological buffer area should be established to limit radiation doses (TED) to general employees to less than 100 millirem in a year or as needed to keep radiation doses to general employees ALARA.
3. A radiological buffer area is not warranted for:
 - a. High contamination or airborne radioactivity areas that are completely within contamination areas
 - b. Inactive contamination, high contamination, or airborne radioactivity areas (i.e., areas to which entry has been prohibited by posting or barricades)
 - c. Exposure control, if other posted boundaries or controls provide equivalent employee protection
 - d. Exposure control, if general employees who are not trained as radiological workers are restricted from unescorted entry to controlled areas.

- e. Exposure control, if general employees who are not trained as radiological workers are unlikely to be present in the area long enough to receive 100 mrem in a year.

- 4. The need for radiological buffer areas around radioactive material areas, soil contamination areas, and underground radioactive material areas should be determined by the RCO based upon the potential for exposure of unmonitored individuals and the spread of contamination.

- 5. Posting of radiological buffer areas should be in accordance with Article 231 and contain the wording "CAUTION, RADIOLOGICAL BUFFER AREA."

Figure 2-1
Establishing Posted Areas



GERT; General Employee Radiological Training
RW-I; Radiological Worker I
RMA; Radioactive Material Area
RA; Radiation Area

HRA; High Radiation Area
VHRA; Very High Radiation Area
HCA; High Contamination Area
ARA; Airborne Radioactivity Area

