

University of Maryland Baltimore

Radiation Safety Procedure

Procedure Number: 2.2

Title: Posting and Labeling for Radiation Safety

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Technical Review and Approval:

_____ **Date:** _____
Radiation Safety Officer

Radiation Safety Committee Approval:

_____ **Date:** _____
Chair, Radiation Safety Committee

PROCEDURE 2.2, POSTING AND LABELING FOR RADIATION SAFETY

1.0 Purpose:

This procedure establishes requirements for posting of radiological hazard warning signs and labeling of items and containers of radioactive material and radiation-emitting machines.

2.0 Scope:

This procedure applies to all UMB activities involving the use of radiation or radioactive materials as authorized under the UMB Radiation Safety Program, unless specifically excepted. This procedure does not address:

- Labeling and marking of packages or placarding of vehicles for public transportation;
- Posting of licenses, Notices of Violation, responses, Orders, and other postings that may be required under COMAR Part J. These requirements are addressed in Procedure 1.1, *Radiation Safety Program Organization and Administration*.

3.0 Procedure:

3.1. General Requirements for Radiological Postings

- 3.1.1. Unless otherwise specified or excepted, all radiation warning signs and labels shall bear the standard radiation warning trefoil, as described in COMAR D.901, imposed in magenta, purple, or black upon a yellow background [D.901(a)].
- 3.1.2. Labels applied to sources, source holders, and device components that are subjected to high temperatures shall bear the standard radiation warning trefoil, but may be excepted from the standard color requirements [D.901(b)].
- 3.1.3. Additional information shall be provided on or near radiation warning signs and labels, as appropriate, to make individuals aware of potential radiation exposures and to allow affected individuals to minimize exposures [D.901(c)].
- 3.1.4. Warning signs shall be posted at each discrete entrance point such that any individual approaching the entrance point is warned of the hazard(s) in the area.

- 3.1.5. An area shall be considered accessible if an individual may gain access to the radiological hazard or radioactive material without extreme measures (e.g., using a ladder to enter through an elevated window) or physical destruction of barriers. Areas that are enclosed by locked doors are typically considered to be accessible and should be posted.

3.2. Requirements For Posting Specific Areas

- 3.2.1. Radiation Area - The words, "Caution, Radiation Area" shall be posted at any accessible area in which radiation levels could result in any individual receiving an external dose equivalent exceeding 0.005 rem in one hour at a distance of 30 centimeters from the radiation source or any surface penetrated by the radiation [D.902(a)].
- 3.2.2. High Radiation Area - The words, "Caution" or "Danger" and "High Radiation Area" shall be posted at any accessible area in which radiation levels could result in any individual receiving an external dose equivalent exceeding 0.1 rem in one hour at a distance of 30 centimeters from the radiation source or any surface penetrated by the radiation [D.902(b)].
- 3.2.3. Very High Radiation Area - The words, "Grave Danger, Very High Radiation Area" shall be posted at any accessible area in which radiation levels could result in any individual receiving an external dose exceeding 500 rads in one hour at a distance of one meter from the radiation source or any surface penetrated by the radiation [D.902(c)].
- 3.2.4. Airborne Radioactivity Area - The words "Caution" or "Danger" and "Airborne Radioactivity Area" shall be posted at any room, enclosure, or area in which the airborne radioactive material concentration exceeds: 1) the derived air concentration specified in COMAR; or 2) a level that would result in an individual present in the area without respiratory protective equipment exceeding, during the hours the individual is present in a week, an intake of 0.6 percent of the annual limit on intake (as specified in COMAR) or 12 DAC-hours [D.902(d)].
- 3.2.5. Radioactive Material Area – The words "Caution" or "Danger" and "Radioactive Material(s)" shall be posted at any area or room in which radioactive material is used, handled, or stored in quantities exceeding ten times the quantities specified in COMAR Appendix C

[D.902(e)]. This posting shall also be established at the boundaries of any area where removable surface contamination exists at levels exceeding those provided in Table 1 of Procedure 3.3, *Clearance of Areas, Individuals, Materials, and Equipment*.

3.3. Exceptions from Posting Requirements

- 3.3.1. Posting of areas and rooms containing radioactive material is not required if the room is subject to UMB's control and the radioactive material is continuously attended by an individual who takes proper precautions to prevent exposure of any individual in excess of the dose limits established in COMAR Part D [D.903(a)].
- 3.3.2. Posting of patient rooms and other areas in hospitals is not required if those rooms or areas are occupied by patients who are eligible for release from the hospital in accordance with COMAR Part G, Section 25 [D.903(b)].
- 3.3.3. Posting of rooms and other areas is not required if the rooms or areas contain only therapeutic or diagnostic X-ray machines.

3.4. Labeling of Radioactive Materials and Radiation-Emitting Machines

- 3.4.1. Each container of licensed radioactive material shall be labeled with a clearly visible label bearing the words "Caution" or "Danger" and "Radioactive Material." The label shall provide additional information (radionuclides present, quantity of radioactive material, date of activity estimate, radiation and contamination levels) as may be appropriate and necessary to allow individuals handling, using, or working in the vicinity of the containers to take appropriate protective actions [D.904(a)].
- 3.4.2. Radioactive material labels shall be removed from or defaced on empty containers prior to their removal from unrestricted areas or uncontrolled (nonradioactive) disposal [D.904(b)].
- 3.4.3. Radiation emitting machines shall be conspicuously labeled to warn individuals that the machine emits radiation when energized [D.904(c)].

3.5. Exceptions from Labeling Requirements

3.5.1. Labels are not required on containers of licensed radioactive material:

- In quantities less than those specific in COMAR Part D, Appendix C [D.905(b)];
- In concentrations less than COMAR Part D, Appendix B, Table III [D.905(b)]; or
- That are continuously attended by an individual who takes proper precautions to prevent exposure of any individual in excess of the dose limits established in COMAR Part D [D.905(c)];
- That are in transport and packaged and labeled in accordance with Department of Transportation regulations [D.905(d)];
- That are accessible only to individuals who are authorized to handle or use them or to work in the vicinity and whose contents are clearly identified to those individual on a readily-available written record [D.905(e)];
- That consist of installed manufacturing or process equipment, such as tanks or pipes [D.905(f)].

4.0 Records and Reports

None.

5.0 References:

COMAR 26.12.01.01, Sections D.901 – D.905
Maryland License MD-07-014-01
UMB Radiation Safety Program
USNRC Regulatory Guide 10.8, “Guide for the Preparation of Applications for Medical Use Programs”