



Environment, Safety, Health & Assurance

Interoffice Communication

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Topical Appraisal 2015

From: Michael McGuigan, Radiation Safety Officer, ESH&A

Date: February 16-20, 2015

Subject: RPP Functional Element Area, Posting and Labeling

The Topical Appraisal is attached.

Topical Appraisal - RPP Functional Element Area, Posting and Labeling

1.0 Scope

This topical appraisal was conducted to review the Laboratory's RPP functional element area, Posting and Labeling Requirements, 10 CFR 835, Subpart G, Chapter 12.0 f Guide 441-1C.

2.0 Dates

February 16-20, 2015

3.0 Methodology

The Laboratory's Radiation Protection Program's organization was reviewed within The Ames Laboratory's administrative and safety oversight system. Applicable regulations, guidance, and standards were reviewed to assure that the Laboratory is meeting current industry standards. A walk-through of all controlled areas was conducted to verify posting consistency and appropriateness though out the Lab.

3.1 References

The following references were reviewed for this appraisal:

- Title 10 of Code of Federal Regulations, Part 835 (10 CFR 835), *Occupational Radiation Protection*,
- DOE Guide 441.1-1C, *Radiation Protection Programs Guide, Chapter 12.0*
- DOE Standard 1098-2008 Ch1, *Radiological Control*,

The regulatory requirements from 10 CFR 83, Subpart G, Posting and Labeling, have been place in the matrix below. The Compliance/Comment column points to the documentation and coverage of the rule.

<i>Subpart G-Posting and Labeling</i>	
<i>§ 835.601 General requirements.</i>	
(a) Except as otherwise provided in this subpart, postings and labels required by this subpart shall include the standard radiation warning trefoil in black or magenta imposed upon a yellow background.	Procedure 10202.016 page 3: Except as noted, all postings and labels used to designate controlled or radiological areas or radioactive material have the standard radiation warning trefoil in either black or magenta imposed upon a yellow background. Lettering should be magenta or black. Magenta is the preferred color for both the standard radiation warning trefoil and the lettering. The background for the entire sign or label should be yellow.
(b) Signs required by this subpart shall be clearly and conspicuously posted and may include radiological protection instructions	Procedure 10202.016 page 1: signs used for radiation protection purposes are clearly and conspicuously posted; furthermore postings can and in many cases include protection instructions communicating area radiation hazards.

(c) The posting and labeling requirements in this subpart may be modified to reflect the special considerations of DOE activities conducted at private residences or businesses. Such modifications shall provide the same level of protection to individuals as the existing provisions in this subpart.	Add wording, "No DOE/Ames Lab radiation activities are conducted at private residences or businesses."
§ 835.602 Controlled areas.	
(a) Each access point to a controlled area (as defined in § 835.2) shall be posted whenever radiological areas or radioactive material areas exist in the area. Individuals who enter only controlled areas without entering radiological areas or radioactive material areas are not expected to receive a total effective dose of more than 0.1 rem (0.001sievert) in a year.	Procedure 10202.016 page 6: Controlled areas are established and posted to warn individuals that they are entering areas controlled for radiation protection purposes. All radiological areas lie within the boundaries of controlled areas. Certain areas recommended by this procedure, such as soil contamination areas, do not have to be located inside a controlled area. Individuals who enter only controlled areas without entering radiological areas are not expected to receive a total effective dose equivalent exceeding 100 millirem in a year.
(b) Signs used for this purpose may be selected by the contractor to avoid conflict with local security requirements.	Procedure 10202.016 page 6: There are no security requirements at Ames Laboratory that conflict with the choice of sign at the present time.
§ 835.603 Radiological areas and radioactive material areas.	
Each access point to radiological areas and radioactive material areas (as defined at § 835.2) shall be posted with conspicuous signs bearing the wording provided in this section.	Procedure 10202.016 page 5: Personnel entry control shall be maintained for each radiological area. A radiological area is an area within a controlled area defined as a radiation area, high radiation area, very high radiation area, contamination area, high contamination area, or airborne radioactivity area, in accordance with 10 CFR 835.
(a) Radiation Area. The words "Caution, Radiation Area" shall be posted at each radiation area.	Procedure 10202.16 will be strengthened by replacing "should" with "shall" in Area Posting Requirements.
(b) High Radiation Area. The words "Caution, High Radiation Area" or "Danger, High Radiation Area" shall be posted at each high radiation area.	Procedure 10202.16 will be strengthened by replacing "should" with "shall" in Area Posting Requirements.
(c) Very High Radiation Area. The words "Grave Danger, Very High Radiation Area" shall be posted at each very high radiation area.	Procedure 10202.16 will be strengthened by replacing "should" with "shall" in Area Posting Requirements.
(d) Airborne Radioactivity Area. The words "Caution, Airborne Radioactivity Area" or "Danger, Airborne Radioactivity Area" shall be posted at each airborne radioactivity area.	Procedure 10202.16 will be strengthened by replacing "should" with "shall" in Area Posting Requirements.

<p>(e) Contamination Area. The words "Caution, Contamination Area" shall be posted at each contamination area.</p>	<p>Procedure 10202.16 will be strengthened by replacing “should” with “shall” in Area Posting Requirements.</p>
<p>(f) High Contamination Area. The words "Caution, High Contamination Area" or "Danger, High Contamination Area" shall be posted at each high contamination area.</p>	<p>Procedure 10202.16 will be strengthened by replacing “should” with “shall” in Area Posting Requirements.</p>
<p>(g) Radioactive Material Area. The words "Caution, Radioactive Material(s)" shall be posted at each radioactive material area.</p>	<p>Procedure 10202.016 page 7: The standard radiation warning trefoil and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL" must be posted at each radioactive material area as defined in 10 CFR 835.2.</p>
<p>§ 835.604 Exceptions to posting requirements.</p>	
<p>(a) Areas may be excepted from the posting requirements of § 835.603 for periods of less than 8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures.</p>	<p>Procedure 10202.016 page 7: Accessible areas may be excepted from the radiological area posting requirements for transient radiological conditions of less than 8 continuous hours duration when posting is not practical, such as radioactive material transfers, and when individuals who are knowledgeable of and empowered to implement required access and exposure control measures are stationed to provide line of sight surveillance and verbal warnings in lieu of posting.</p>
<p>(b) Areas may be excepted from the radioactive material area posting requirements of § 835.603(g) when:</p> <ol style="list-style-type: none"> (1) Posted in accordance with § 835.603(a) through (f); or (2) Each item or container of radioactive material is labeled in accordance with this subpart such that individuals entering the area are made aware of the hazard; or (3) The radioactive material of concern consists solely of structures or installed components which have been activated (i.e. such as by being exposed to neutron radiation or particles produced in an accelerator). 	<p>Procedure 10202.016 page 7: The “Caution, Radioactive Material(s)” posting may be omitted if it is determined that the posting does not convey additional useful information to the worker as under the following circumstances: (1) The area is posted in accordance with 10 CFR 835.603(a) through (f); or (2) Each item or container of radioactive material is labeled in accordance with this subpart such that individuals entering the area are made aware of the hazard; or (3) The radioactive material of concern consists solely of structures or installed components which have been activated (i.e. such as by being exposed to neutron radiation or particles produced in an accelerator).</p>
<p>(c) Areas containing only packages received from radioactive material transportation labeled and in non-degraded condition need not be posted in accordance with § 835.603 until the packages are monitored in accordance with § 835.405.</p>	<p>Procedure 10202.016 page 7: Packages received from radioactive material transportation, which are labeled and in non-degraded condition should be temporarily isolated in a posted Radioactive Material Area until the monitoring can be conducted.</p>

<p>§ 835.605 Labeling items and containers.</p>	
<p>Except as provided in § 835.606, each item or container of radioactive material shall bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words "Caution, Radioactive Material" or "Danger, Radioactive Material." The label shall also provide sufficient information to permit individuals handling, using, or working in the vicinity of the items or containers, to take precautions to avoid or control exposures.</p>	<p>Procedure 10202.016 page 7/8: Except as provided in 10 CFR 835.606, each item or container of radioactive material shall bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words "Caution, Radioactive Material" or "Danger, Radioactive Material." The label shall also provide sufficient information to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.</p> <p>ESH&A page 3: All containers of radioactive materials and items, suspected or known to be contaminated, shall be properly labeled (i.e. with tape or tag bearing the radiation warning trefoil logo and the words "Caution, Radioactive Material or Danger, Radioactive Material").</p> <p>Manual, 10200.003 page 15/16: All known radioactive waste, at a minimum, must be labeled "CAUTION RADIOACTIVE WASTE".</p> <p>Labels should have a yellow background with magenta or black standard radiation symbol. Lettering shall also be black or magenta, with magenta being preferred. Labels shall include contact radiation levels, removable surface contamination levels (specified as alpha or beta-gamma), dates surveyed, surveyor's name, and a description of contained radionuclides with their respective concentrations.</p> <p>10202.016 page 3: Each item or container of radioactive materials should bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words "Caution, Radioactive Material" or "Danger, Radioactive Material." The label must also provide sufficient information to permit individuals handling, using, or working in the vicinity of the items or containers, to take precautions to avoid or control exposures.</p>
<p>§ 835.606 Exceptions to labeling requirements.</p>	

<p>(a) Items and containers may be excepted from the radioactive material labeling requirements of § 835.605 when:</p> <ol style="list-style-type: none"> (1) Used, handled, or stored in areas posted and controlled in accordance with this subpart and sufficient information is provided to permit individuals to take precautions to avoid or control exposures; or (2) The quantity of radioactive material is less than one tenth of the values specified in appendix E of this part and less than 0.1 Ci; or (3) Packaged, labeled, and marked in accordance with the regulations of the Department of Transportation or DOE Orders governing radioactive material transportation; or (4) Inaccessible, or accessible only to individuals authorized to handle or use them, or to work in the vicinity; or (5) Installed in manufacturing, process, or other equipment, such as reactor components, piping, and tanks; or (6) The radioactive material consists solely of nuclear weapons or their components. 	<p>Procedure 10202.016 page 9/10: Containers and items are excepted from the radioactive material labeling requirements of 10 CFR 835.605 when:</p> <ol style="list-style-type: none"> 1. The items or containers are used, handled, or stored in radiological areas posted and controlled in accordance with 10 CFR 835.603 and 835.604 and sufficient information is provided to permit individuals to take appropriate protective actions. This information should be provided on or in conjunction with the area postings or in the controlling work authorization for that area; or 2. The quantity of radioactive material is below the values specified in Appendix E of 10 CFR 835. For containers that contain numerous items of radioactive material, the determination of the need for labeling should be based upon the sum of the activities of the individual items; or 3. Packaged and labeled in accordance with the regulations of the Department of Transportation or corresponding DOE Orders; or 4. Accessible only to individuals authorized to handle or use them, or to work in the vicinity. In such situations, the individuals should be trained as radiological workers and knowledgeable of the types and quantities of radioactive material present in the area; or 5. Installed in manufacturing or process equipment, such as reactor components, piping, and tanks.
<p>(b) Radioactive material labels applied to sealed radioactive sources may be excepted from the color specifications of § 835.601(a).</p>	<p>Procedure 10202.016 page 10: Labels applied to sealed radioactive sources may be excepted from the color specifications of 10 CFR 835.601(a) but must provide the individual with sufficient information to identify the item as radioactive.</p>

3.2 Program Documentation

The following programmatic documents were reviewed;

- Radiation Protection Program Plan (10202.004), Due for review 07-01-2016,
- Ames Laboratory ESH&A Program Manual (10200.002), and
- Also see attachment one for a list of RPP documents.

3.3 Training

No specific training is required for the implementation of the Lab's organization and administration.

3.4 Personnel Interviewed

None identified.

4.0 Assessment Results & Discussion

Results of this appraisal are as follows:

4.1 Strengths

None noted

4.2 Noteworthy Practices

None noted.

4.3 Findings

1. Level 3 Finding, 10CFR 835.601(c), *"The posting and labeling requirements in this subpart may be modified to reflect the special considerations of DOE activities conducted at private residences or businesses. Such modifications shall provide the same level of protection to individuals as the existing provisions in this subpart."*

The explicit wording stating that no radiological work is conduct at private residences or businesses will be added to procedure 10202.016, as well as applicable documents; Radiological Protection Program plan and ESH&A manual.

2. Level 3 Finding, 10CFR 835.603(a-f), *"(a) Radiation Area. The words "Caution, Radiation Area" shall be posted at each radiation area. (b) High Radiation Area. The words "Caution, High Radiation Area" or "Danger, High Radiation Area" shall be posted at each high radiation area. (c) Very High Radiation Area. The words "Grave Danger, Very High Radiation Area" shall be posted at each very high radiation area. (d) Airborne Radioactivity Area. The words "Caution, Airborne Radioactivity Area" or "Danger, Airborne Radioactivity Area" shall be posted at each airborne radioactivity area. (e) Contamination Area. The words "Caution, Contamination Area" shall be posted at each contamination area. (f) High Contamination Area. The words "Caution, High Contamination Area" or "Danger, High Contamination Area" shall be posted at each high contamination area."*

Procedure 10202.016 will be updated. Procedure will be strengthened by replacing "should" with "shall" in Area Posting Requirements. In practice controlled areas are being posted in accordance to 10 CFR 835 rules. Ames Lab procedure 10202.016 uses the wording, "should," where 835 uses, "shall," for 10 CFR 835.603 wording. Procedures need to match that of the promulgated.

5.0 Overall Conclusions

Ames Laboratory is fulfilling its obligations pertaining to Radiation Protection Program organization for implementing a program that meets DOE, 10 CFR 835, subpart G, Posting and Labeling. More explicit language is recommended in supporting documents to strengthen program administration.

6.0 Attachments

Attachment One: List of RPP documents

Attachment Two: Controlled Area walk-through list

Attachment 1- List of RPP Documents

DocNum	DocType	Current Title
10202.043	Form	MC&A Check List
10202.021	Form	Exchange of Quarterly TLD Badges
10202.034	Form	Occupational Radiation Exposure Record
10202.016	Form	Radiological Work Permit Guidance and Checklist
10202.025	Form	RWP Summary & Close Out Form
10202.047	Form	Radiological Material Datapage
10202.018	Form	General RWP Format Template
10202.044	Form	Lost Dosimeter Report
10202.041	Form	Materials Balance Area Inventory and Report Form
10202.019	Form	Specific RWP Format Template
10202.006	Form	Checklist for Initiating the use of Rad Mat/Rad Pro devices
10202.012	Form	Radiation Survey Instrument Training (AL-157)
10202.024	Form	Sealed Source Accountability Form
10202.028	Form	Ames Laboratory Air Monitoring Record
10202.023	Form	Sealed Source Inventory Form
10202.022	Form	Analytical X-Ray System Inspection and Survey Record
10202.042	Form	MC&A Nuclear Material Transfer Form
10202.003	Guide	Rad Worker Study Guide for Support Staff
10202.002	Manual	Radiological Worker Study Guide
10202.002	Plan	Materials Control and Accountability Program Plan
10202.001	Plan	Internal Radiation Dosimetry Contingency Plan
10202.005	Plan	External Dosimetry Technical Basis Document
10202.012	Policy	Walk Down of Posted General Radiological Work Permits
10202.015	Procedure	Sealed Radioactive Source Accountability and Control
10202.031	Procedure	Health Physics Group Review of Service Order Requisitions
10202.008	Procedure	Control of Radioactive Contamination
10202.064	Procedure	Facility Categorization for Radiological Material
10202.011	Procedure	Calibration of Portable Survey Instruments
10202.016	Procedure	Posting and Labeling for Radiological Control
10202.021	Procedure	Workplace Air Monitoring
10202.036	Procedure	External Dosimetry Program Implementation
10202.060	Procedure	Conducting Contamination and Area Monitoring Surveys
10202.014	Procedure	Receipt, Transfer, & Shipment of Radioactive Materials
10202.001	Charter	ALARA Committee Charter
10202.002	Charter	Laser Safety Committee Charter
10202.003	Form	Application for Use of Radioactive Materials
10202.005	Form	Application for Use of Radiation Producing Devices
10202.008	Form	Declaration of Pregnancy
10202.033	Form	Dosimetry History Request Form
10202.037	Form	Employee Radiation Dosimetry Badge Agreements and Commitments

DocNum	DocType	Current Title
10202.038	Form	Ames Laboratory Dosimetry Authorization Form
10202.048	Form	RW I/II (AL-207) Practical Factors Exam Employee Sign-off Record.
10202.049	Form	Laser Hazard Assessment Form
10202.052	Form	Rad Worker II (Rad Materials) Learning Assessment b (AL-077)
10202.054	Form	Learning Assessment "General Employee Radiological Training (GERT) (AL-074)
48202.014	Form	Laser User Authorization Form
10202.001	Guide	Radiation Safety Study Guide for Users of Radiation Generating Devices
10202.001	Procedure	ALARA Procedure
10202.001	Handout	Standard for Protection Against Radiation - Notice
10202.002	Handout	Radiation Protection Program
10200.002	Manual	ESH&A Manual "Radiation Protection"
10202.002	Manual	Radiological Worker Study Guide
10202.004	Plan	Radiation Protection Program (RPP)
10202.001	Policy	ALARA Policy

Attachment Two: Controlled Area walk-through list

Controlled Area		
Room	Building	Description
54	Wilhelm Hall	Entry to junction of NW vertical stair chase and West N-S tunnel (Contamination Area access point)
B40	Spedding Hall	RGD
247/248	Spedding	RGD
10	Wilhelm Hall	Entry to East N-S tunnel (Contamination Area access point)
232	Spedding Hall	RGD
31	Wilhelm Hall	Entry into subbasement area
336	Spedding Hall	RGD
338/339	Spedding Hall	RGD
401A	Wilhelm Hall	Checked stair chase entrance on roof, "Doghouse".
SB6 SB6	Wilhelm Hall	Entry to SE tunnel (Contamination Area access point)
352	Spedding Hall	RGD
37/38	Spedding Hall	RGD
SB1	Wilhelm Hall	Entry to West N-S tunnel from Center E-W tunnel (Contamination Area access point)
SW Stairwell Chase	Wilhelm Hall	Entry doors on each mid stair landing (Contamination Area access point)
SB4	Wilhelm Hall	Entry to SW tunnel (Contamination Area access point)
SB2	Wilhelm Hall	Entry to Center N-S tunnel (Contamination Area access point)
SB1B	Wilhelm Hall	Entry to NE tunnel (Contamination Area access point)
SB1	Wilhelm Hall	Trap door to the "Pit" = 44' tunnel running E-W under floor (Contamination Area access point)
NE Stairwell Chase	Wilhelm Hall	Entry doors on each mid stair landing (Contamination Area access point)
A12	Physics Hall	RGD

Controlled Area		
Room	Building	Description
A202	Physics Hall	RGD
A221	Physics Hall	RGD
53	SPH	RGD
211A	Metals Development	RGD
105/106	SPH	RGD
B56B	Spedding Hall	LLW
10	Spedding Hall	Radioactive Materials
B53	Spedding Hall	MBA
159	Metals Development	RGD
B54	Spedding Hall	HP Lab
B56A	Spedding Hall	Rad Waste Area
105	Mechanical Maintenance Building	Radioactive Waste Area (RWA)
146	Metals Development	RGD
142	Metals Development	RGD
A304	Physics Hall	RGD
11	Wilhelm Hall	Sealed source lab