



THE Ames Laboratory

Creating Materials & Energy Solutions

U.S. DEPARTMENT OF ENERGY

Environment, Safety, Health & Assurance

Interoffice Communication

G40 TASF

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To: Sean Whalen, Manager ESH&A
cc: Shawn Nelson, Assistant Manager ESH&A
Topical Appraisal 2015

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

Date: September 11, 2015

Subject: RPP Functional Element Area, Radiological Controls, Work Controls, Radiation Generating Devices (RGD)

The Topical Appraisal is attached.

Topical Appraisal - RPP Functional Element Area, Rad. Controls, Work Planning, RGDs

1.0 Scope

This topical appraisal was conducted to review the Laboratory's RPP functional element area, Radiological Controls, Work Controls, 10 CFR 835, 1003, and DOE G 441.1-1C, Radiation Protection Programs Guide for use with 10 CFR 835, Chapter 7.0, Radiation Generating Devices.

2.0 Dates

September 1-4, 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. The Radiological Control, Radiological Work Controls was also reviewed.

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 for use with 10 CFR 835*, Chapter 7.0, Radiation Generating Devices.

The regulatory requirements from 10 CFR 835, 1003, Radiological Controls, and Work Controls requirements have been placed in the matrix below. The Compliance/Comments column points to the documentation and coverage of the rule.

§ 835.1003 Workplace Controls.	Implementation/Comments
<p>During routine operations, the combination of engineered and administrative controls shall provide that:</p> <ul style="list-style-type: none">(a) The anticipated occupational dose to general employees shall not exceed the limits established at § 835.202; and(b) The ALARA process is utilized for personnel exposure to ionizing radiation.	<p>Plan 10202.004, Radiation Protection Plan (RPP), section 5.0. Ames Laboratory radiation protection program commitment to maintaining workers dose ALARA.</p> <p>RPP, Section 13.0, Radiation Generating Devices outlines requirements of x-ray systems and work controls at Ames Laboratory.</p> <p>Procedure 10202.010, Radiological Work Permit, Section 3.0, Purpose and Scope, states the Laboratory's commitment to workers exposure to radiation ALARA.</p>

3.2 Program Documentation

The following programmatic documents were reviewed:

- *Radiation Protection Program Plan* (10202.004), due for review 07-01-2016
As a result of the June 2014 DOE Radiation Protection Program Assessment, level 2 finding, F2-1, the Laboratory's RPP is currently being reviewed. The finding stated that the Laboratory's RPP document does not address each §835 requirement. A matrix was developed to demonstrate whether all §835 requirements are being adequately addressed by the current RPP. The Laboratory also committed to developing additions/updates to the RPP as necessary and assuring

the matrix will demonstrate compliance with §835 requirements. The June 2014 assessment team advised that exact wording from §835 should be imbedded in the RPP and/or supporting documentations. Matrixes were developed, and while completing the matrix gaps in administrative coverage were identified. Exact wording from §835, in entirety, are not present within the Ames Laboratory's RPP and/or supporting documentation. To correct the finding and improve the program exact, wording from §835 is being inserted into The Ames Laboratory RPP, and the Ames Laboratory Radiological Safety Program Description.

- *Ames Laboratory ESH&A Program Manual (10200.002)*, The Laboratory's Environment, Safety, Health & Assurance Program Manual (Safety Manual) was last updated in 2011. The Safety Manual is being revised. Subject Matter Experts have been assigned sections to update the Safety Manual. The Laboratory's RSO is assigned section 7, Radiological Protection Program. Section 7 is under review and is being updated.
- *ALARA Policy (10202.001)*, Rev. 5.1, the procedure was last revised 05/10/2013. It is due for update 02/01/2016. No issues noted.
- *Radiological Work Permit Procedure (10202.010)*, implemented 01/15/2015. Document was created per the June 2014 RPP assessment corrective action plan. It is due for update 01/15/2018. No issues noted.
- *Maintenance Procedures for Engineered X-ray Barrier Safety System (46200.005)*, Rev. 9, the procedure was last revised 08/15/2013. It is due for update 08/15/2016. No issues noted. Please see Attachment three, X-ray Barrier Preventative Maintenance Schedule.

3.3 Training

Persons past their due date for Radiological Worker retraining are not authorized to work with radiation generating devices or radioactive materials. Emails are sent to past due participants and their respective supervisors and group leader. Dosimetry rings and whole body badges are collected and held until retraining is up-to-date. As of September 11, 2015 no radiation workers, were past due for retraining for AL-076, Radiological Worker two.

3.4 Personnel Interviewed

Terry Hermann, Engineer, Facilities and Engineering Services, manages the x-ray interlock preventative maintenance program which also involves the installation of new interlocks at the Lab. Terry voiced no concerns about the x-ray interlock program. He did mention that the department is working toward automating its issuances of jobs to the technicians for jobs that have a regular cycle. Job tickets will be issued, jobs tracked, statuses, completion dates and if any follow up is needed. The application will be within the Deltec system. Terry asserts that the new application will improve management of work processes.

4.0 Assessment Results & Discussion

4.1 Strengths

None noted

4.2 Noteworthy Practices

None noted

4.3 Findings

None noted.

5.0 Overall Conclusions

Ames Laboratory is fulfilling its obligations to Radiation Protection Program organization for implementing a program that meets DOE, 10 CFR 835, 1003; Radiological Controls, Work Place Controls requirements as they pertain to radiation generating devices.

6.0 Attachments

Attachment One: List of RPP documents

Attachment Two: Ames Laboratory RGD inventory

Attachment Three: X-ray Barrier Preventative Maintenance Schedule

Attachment One: 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	Form	Application for Use of Radioactive Materials
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
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	L A "General Employee Radiological Training (GERT) (AL-074)
48202.014	Form	Laser User Authorization Form
10202.003	Guide	Rad Worker Study Guide for Support Staff
10202.001	Guide	Radiation Safety Study Guide for Users of Radiation Generating Devices
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
10202.004	Plan	Radiation Protection Program (RPP)
10202.012	Policy	Walk Down of Posted General Radiological Work Permits
10202.001	Policy	ALARA Policy
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

Attachment One: List of RPP documents

10202.010	Procedure	Radiological Work Permit
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	Procedure	ALARA Procedure
10202.001	Charter	ALARA Committee Charter
10202.002	Charter	Laser Safety Committee Charter
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

Attachment Two: Ames Laboratory RGD Inventory

Bldg	Rm	Manufacture	Activity#	RWP	2015	Status
MD	142	Bruker	30409.005	NA	6/1/2015	Active
MD	146	Phillips	30407.012	YES	1/1/2015	Active
MD	159	PANalytical	30409.005	NA	4/3/2015	Active
MD	159	Bruker	30409.005	NA	8/1/2015	Active
MD	211A	Thermo Scientific	30415.011	NA	6/30/2015	Active
SpH	247/248	PANalytical	30408.011	NA	Last reviewed 11/20/2014	Active
SpH	336	STOE Stadi P	30612.001	YES	1/13/2015	Active
SpH	338	Bruker	30612.001	YES	1/13/2015	Active
SpH	338	Seifert-STOE	30612.001	YES	1/13/2015	Active
SpH	352	Phillips	30470.001	YES	1/13/2015	Active
SPH	352	Bruker	30407.024	NA	8/1/2015	Active
SpH	53	Rigaku	30441.004	NA	4/8/2015	Active
SpH	38	Rigaku	30446.001	NA	5/5/2015	Active
SpH	B40	Rigaku	30408.011	YES	1/15/2015	Active
Zaffarano	A12	Rigaku	30441.004	NA	4/1/2015	Active
Zaffarano	A202	Rigaku	30400.041	NA	6/30/2015	Active
Zaffarano	A221	Rigaku Ultra X-18	30439.001	YES	Last reviewed 12/22/2014	Developmental
Zaffarano	A221	Rigaku RU-300	30439.001	YES	System move, open beam, beam enclosure construction	Developmental
Zaffarano	A221	GE Inspector Tech (LAUE) a.k.a., Spellman LAUE	30439.001	YES	Last reviewed 10/10/2014	Active, no bypassing of interlock.
Zaffarano	A221A	Rigaku MicroFlex-700	30439.001	YES	locked out.	Active
Zaffarano	A304	Phillips	30434.003	YES	12/1/2015	Active

Attachment Three: X-ray Barrier Preventative Maintenance Schedule

X-Ray Barrier Preventive Maintenance Schedule

Building & Room #	Unit Description	Contact Person & Phone #	Alternate Contact & Phone #	Date of PM	PM Performed by	Comment	Audit Performed By	Date of Audit
MD142	Bruker M4	Matt Besser 294-6719	Ott, Ryan 294-3616	12/22/2014	J. Hjortshoj			
MD146	Phillips	Lagrosso, Tom 294-8425	Schiagel, Deb 294-2385	12/22/2014	J. Hjortshoj			
MD159	Panalytical	Matt Besser 294-6719	Lagrosso, Tom 294-8425	12/22/2014	J. Hjortshoj		T. Hansen	12/30/14
MD159	Bruker D8	Matt Besser 294-6719	432 (computer log book)	12/22/2014	J. Hjortshoj		T. Hansen	12/30/14
MD211A	Niton-hand unit	Paul Berge 294-5972		6/24/2014	J. Hjortshoj	Failed		
Sped 110	Bruker PXRF	Jones, Roger 294-3894	McClelland, John 294-7948	12/22/2014	J. Hjortshoj	Locked out- McGuigan		
Sped 248	PANalytical	Rink, Roger 294-3848	Rink, Roger 294-3848	12/22/2014	J. Hjortshoj			
Sped 324	Perkin Elmer	Anderegg, Jim 294-3480		12/22/2014	Sealed- no interlock			
Sped 336	Stoe-STAD	Miller, Gordy 294-0105	Anderegg, Jim 294-3480	12/22/2014	J. Hjortshoj			
Sped 338	Bruker Nonius	Miller, Gordy 294-0105	Anderegg, Jim 294-3480	12/22/2014	J. Hjortshoj	not working		
Sped 338	Seifert-STOE	Miller, Gordy 294-0105	Anderegg, Jim 294-3480	12/22/2014	J. Hjortshoj			
Sped 352	Phillips	Muching, Anya 294-1214	Anderegg, Jim 294-3480	12/22/2014	J. Hjortshoj			
Sped 53	Glove box	Budko, Sergey 294-3986		12/22/2014	J. Hjortshoj		T. Hansen	12/30/14
Sped B40	Rigaku	Gschneidner, Carl 294-7931	Rink, Roger 294-3848	12/22/2014	J. Hjortshoj			
Sped38	Rigaku	Vaknin, David 294-6023		12/22/2014	J. Hjortshoj			
Zaf A12	Rigaku	Budko, Sergey 294-3986		12/22/2014	J. Hjortshoj			
Zaf A202	Rigaku	Johnston, David 294-5435		12/22/2014	J. Hjortshoj			
Zaf A221	Spellman	Goldman, Alan 294-3585	Kreyssig, Andreas 294-9962	12/22/2014	J. Hjortshoj			
Zaf A221	Rigaku 1	Goldman, Alan 294-3585	Kreyssig, Andreas 294-9962	6/24/2014	J. Hjortshoj	not working		
Zaf A221	Rigaku Ultra18	Goldman, Alan 294-3585	Kreyssig, Andreas 294-9962	12/22/2014	J. Hjortshoj			
Zaf A221A	Rigaku-007	Goldman, Alan 294-3585	Kreyssig, Andreas 294-9962	6/24/2014	J. Hjortshoj	not working		
Zaf304	Phillips	Kaminski, Adam 294-0849		12/17/2014	J. Hjortshoj			