



Environment, Safety, Health & Assurance

Interoffice Communication

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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: January 22, 2015

Subject: RPP Functional Element Area, Limits for the Embryo/Fetus

The Topical Appraisal is attached.

Topical Appraisal - RPP Functional Element Area, Organization and Administration

1.0 Scope

This topical appraisal was conducted to review the Laboratory's RPP functional element area, Management and Administrative Requirements, 10 CFR 835, Subpart C, Chapter 8.0 of Guide 441-1C.

2.0 Dates

January 7-9, 2015.

3.0 Methodology

The Laboratory's Radiation Protection Program's organization was reviewed within The Ames Laboratory's coverage of requirements within 10 CFR 835.206, limits to embryo and fetus. Applicable regulations, guidance, and standards were reviewed to assure that the Laboratory is meeting current industry standards.

According to DOE Guide 441.1-1C, *Radiation Protection Programs Guide*, essential elements of an acceptable program to evaluate and control radiation dose to the embryo/fetus include:

- voluntary, formal declaration of pregnancy, including the estimated date of conception;
- voluntary, formal withdrawal of declaration of pregnancy;
- work restrictions for workers who have voluntarily declared their pregnancies;
- counseling of workers;
- dose calculation and monitoring methods;
- worker training;
- record-keeping; and
- reporting.

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 8.0*
- DOE Standard 1098-2008 Ch1, *Radiological Control*,

The regulatory requirements from 10 CFR 835.206, Limits for the Embryo/Fetus, have been placed in the matrix below. The Compliance/Comment column points to the documentation and coverage of the rule.

	Compliance/Comments
<p>§ 835.206 <i>Limits for the embryo/fetus.</i></p> <p>(a) The equivalent dose limit for the embryo/fetus from the period of conception to birth, as a result of occupational exposure of a declared pregnant worker, is 0.5 rem (0.005 Sv).</p>	<p>The Ames Laboratory Radiation Protection Program (RPP) Plan 10202.004 Section 9, PERSONNEL ESPOSURE, defines a declared pregnant worker, that this designation can be revoked in writing at any time by the declared pregnant worker and that a pregnant worker consents to her employer to limit her dose to that of 500mrem. The RPP also explains what form to use to declare and to whom the form should be given.</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 limits to the Embryo/Fetus.

3.4 Personnel Interviewed

None identified.

4.0 Assessment Results & Discussion

According to DOE Guide 441.1-1C, *Radiation Protection Programs Guide*, essential elements of an acceptable program to evaluate and control radiation dose to the embryo/fetus include:

- 1 voluntary, formal declaration of pregnancy, including the estimated date of conception;
- 2 voluntary, formal withdrawal of declaration of pregnancy;
- 3 work restrictions for workers who have voluntarily declared their pregnancies;
- 4 counseling of workers;
- 5 dose calculation and monitoring methods;
- 6 worker training;
- 7 record-keeping; and
- 8 reporting.

Starting with the first element listed above,

1. Voluntary and formal declaration of pregnancy is accomplished by using Ames Lab form 10202.008, "Declaration of Pregnancy" (see attachment one).
2. Ames Laboratory does not have a formal form for withdrawal of declaration of pregnancy. It is acceptable to withdraw declared pregnancy status via an email or memo to the Radiation Safety Officer.
3. Radiation worker activities are reviewed by the RSO with the declared pregnant worker and her supervisor then restrictions are assigned commensurate the hazards and dose assessment.

4. Female radiation workers receive Ames Lab form 10202.007, "Memo to Female RWs." This memo informs the worker where to find additional information concerning ionizing radiation and embryo/fetus exposure. The memo also informs the worker where to find a copy of the Declaration of Pregnancy form (see attachment two).
5. The Ames Laboratory also does not have a dose record form. The Lab's dosimetry vendor provides exposure record documentation.
6. Radiation workers are informed of their rights at initial radiation worker training and during subsequent two year retraining cycles.
7. The Ames Laboratory does not have a dose record form. The Lab's dosimetry vendor provides exposure record documentation. Dose records are kept on file with the Health Physics group. No declaration of pregnancy cases have been documented at Ames Laboratory in the past 10 years. No active declarations of pregnancy cases were active during the review period of the topical appraisal.
8. Ames Laboratory submits radiation exposure records to the Radiation Exposure Monitoring System (REMS) per DOE Order 231.1B and the REMS reporting guide. Radiation exposure records at Ames Laboratory are maintained under two statuses; active and inactive archived file. Active dosimetry files are maintained in the Environment Safety Health and Assurance Office, Health Physics group files. Inactive archived dosimetry files are files that have been turned over to the Ames Laboratory Documents and Records Office. These records are secured with other Lab critical documents in the climate controlled facility, Record Holding Area, under 24 hour, 7 days a week security monitoring.
Dosimetry participants receive an annual radiation dose report, NRC Form 5, explaining the previous monitoring period (see attachment three) per 835.801(c). Radiation dose reports are made available upon request by an individual following the provisions of Privacy Act (5 U.S.C. 552a). Radiation workers may request dose reports by submitting Ames Laboratory form# 10202.033, "Dosimetry History Request Form" (see attachment four).

4.1 Strengths

None noted

4.2 Noteworthy Practices

None noted.

4.3 Findings

Level 3 Finding: Per DOE Guide 441.1-1C, *Radiation Protection Programs Guide*, essential elements of an acceptable program to evaluate and control radiation dose to the embryo/fetus a formal withdrawal of declaration of pregnancy should be part of an effective radiation protection program. A new form will be developed to provide a formal path for a declared pregnant worker to withdraw their declaration of pregnancy. In the past it was acceptable for a declared pregnant worker to withdraw her declaration via an email or memo stating withdrawal. It would be a program improvement to provide a formal form for withdraws of declaration of pregnancy.

Level 3 Finding: Per DOE Guide 441.1-1C, *Radiation Protection Programs Guide*, essential elements of an acceptable program to evaluate and control radiation dose to the embryo/fetus, dose calculation and monitoring methods, should be part of an effective radiation protection program. Dose calculation and monitoring methods are established for declared pregnant workers. Ames Laboratory Radiation Protection Program utilizes Landauer Dosimetry Inc. fetal dosimeters for recording external radiation exposures of declared pregnant workers. It would be a program improvement to create a formal embryo/fetus dose record form. The new form will model DOE Guide 441.1-1C, Appendix 8.C, Embryo/Fetal Dose Record Form.

5.0 Overall Conclusions

Ames Laboratory is fulfilling the radiation protection requirements of 10 CFR 835.206, "Limits for the embryo/fetus." No active declarations of pregnancy cases were active during the review period of the topical appraisal. No declaration of pregnancy cases have been documented at Ames Laboratory in the past 10 years. Minor program opportunities for improvement have been mentioned above.

6.0 Attachments

Attachment One: Form 10202.008, *Declaration of Pregnancy*,

Attachment Two: Form 10202.007, *Memo to Female Radiological Workers*

Attachment Three: NRC Form 5

Attachment Four: Form 10202.033, *Dosimetry History Request Form*



DECLARATION OF PREGNANCY

Name: _____ Date of Birth: _____
Employee #: _____ University ID#: _____
Campus Address: _____ Telephone #: _____
Email: _____

In accordance with the DOE's regulations at 10 CFR 835.104, 835.206, I am declaring that I am pregnant. I believe I became pregnant in _____ (only the month and year need be provided).

I understand that my dose will not be allowed to exceed 500 mrem (5 mSv) during my entire pregnancy from occupational exposure to radiation. I understand this limit includes exposure I have already received. I understand that meeting the lower dose limit may require a change in job or job responsibilities during my pregnancy. I also understand that I may revoke this declaration at any time without explanation by submitting written, signed and dated revocation of pregnancy.

(Your signature)

(Date)

The information furnished on this form will be used and maintained pursuant to 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579) also pursuant to 10 CFR 835.

Form 10202.008
ESH&A, HP Group (4-7922)
Revision 5, Effective 10/15/2012



Interoffice Communication

Environment, Safety, Health & Assurance
Health Physics Group
G40 TASF
(515) 294-7922

TO: Ames Laboratory Female Radiation Workers
FROM: Michael McGuigan, Radiation Safety Officer
Environment, Safety, Health, & Assurance
G40 TASF
SUBJECT: Radiation Exposure to Unborn Child

It is the intent of Ames Laboratory that no pregnant worker be exposed to radiation levels large enough to result in a significant risk to the embryo or fetus. It is important that all female radiation workers be aware of the increased sensitivity of the fetus to radiation and to know the proper steps to keep exposure to ionizing radiation to a minimum.

The following information via the links below is provided so that women who become pregnant can make an informed decision on whether or not to formally declare their pregnancy. At such time you would be a declared pregnant worker.

A declared pregnant worker means a woman who has voluntarily declared to her employer, in writing, her pregnancy for the purpose of being subject to the occupational dose limits to the embryo/fetus as provides in 10 CFR 835.206. The radiation exposure limit is 0.5 rem. This declaration may be revoked, in writing, at any time by the declared pregnant worker. To obtain a copy of the [Declaration of Pregnancy](#) form click the link or go to the Ames Laboratory webpage and look for [Declaration of Pregnancy form #10202.008](#). Work restrictions for workers who have declared their pregnancy will be determined after review of radiological work conditions by the RSO.

[Iowa Department of Public Health Prenatal Exposure Guide,](http://www.idph.state.ia.us/eh/common/pdf/radiological_health/prenatalexposure.pdf)
http://www.idph.state.ia.us/eh/common/pdf/radiological_health/prenatalexposure.pdf

[Iowa Department of Public Health](http://www.idph.state.ia.us/eh/common/pdf/radiological_health/occexposure.PDF)
http://www.idph.state.ia.us/eh/common/pdf/radiological_health/occexposure.PDF

<http://www.osha.gov/SLTC/radiationionizing/index.html>

If you have any questions contact me at 515-294-7922 or email me at mcguigan@ameslab.gov.

Form# 10202.007, Rev 0
Memo to Female RWs
Effective date 10-01-2014

NRC FORM 5 <small>(8-2011) 10 CFR PART 20</small>	U. S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO.3150-0006	EXPIRES: 06/30/2014			
OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD		Estimated burden per response to comply with this mandatory collection request: 20 minutes. This information is used to ensure that doses to individual do not exceed regulatory limits. This information is required to record annually report individual occupational exposure to radiation to ensure that the exposure does not exceed regulatory limits. Send comments regarding burden estimate to the Information Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to info@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202, (3150-0006), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.				
1. NAME (LAST, FIRST, MIDDLE INITIAL)		2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (MM/DD/YYYY)	
6. MONITORING PERIOD (MM/DD/YYYY- MM/DD/YYYY)		7. LICENSEE NAME		8. LICENSE NUMBER(S)	9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PBE
INTAKES				DOSES (in rem)		
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci	DEEP DOSE EQUIVALENT (DDE)	11.	
				LENS (EYE) DOSE EQUIVALENT (LDE)	12.	
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE, WB)	13.	
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE, ME)	14.	
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	15.	
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	16.	
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 15) (TEDE)	17.	
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 11 AND 16) (TODE)	18.	
19. COMMENTS						
20. SIGNATURE - LICENSEE				21. DATE PREPARED		

Dosimetry History Request Form

November 1, 2010

Attn: Dosimetry Office

Subject: Request for Occupational Radiation Exposure History

The authority for requesting this information is Public Law 93-438 (The Energy Reorganization Act of 1974) which authorizes the Department of Energy (DOE) to maintain radiation exposure records keeping system to perform the functions vested in DOE. The disclosure of such information may be a condition of employment and will be used by DOE and its contractors to develop a data base of your exposure history. The information is used for your protection, is confidential, and is released to others under controlled circumstances. Personal information such as name, age, Social Security number, etc., will be used to develop accurate and unique records identification.

Name: _____ Social Security Number: _____

Date of Birth (mm/dd/yy): _____ Period of Employment: From _____ To _____

I certify that the above information is correct and complete to the best of my knowledge and release the requested information to Ames Laboratory, U.S. Department of Energy Contract No. DE-AC02-07CH11358

Signature

Date

Please forward your report to the attention of the Dosimetry Office at the following address. Thank you for your assistance.

Sincerely,

Michael McGuigan
Environment, Safety, Health & Assurance
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Ames, Iowa 50011
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