

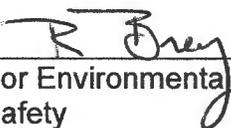
# RADIATION PROCEDURES MANUAL

## Procedure Cover Sheet

Procedure Title: Dosimetry

Procedure Number: EHS-18-02-REV 1

Effective Date: September 21, 2018

Approved By:   
Director Environmental Health  
and Safety

Date: 21 September, 2018



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## A. INTRODUCTION

According to 10 CFR Part 20.1502 and IDAPA 16.02.27, ISU is required to monitor the occupational external exposure of the following individuals, as appropriate:

(a) Adults likely to receive greater than 10% of the annual allowable limits specified in 10 CFR 20.1201(a) and/or they are likely to receive a quarterly dose greater than 25% of the values specified in IDAPA 16.02.27 (110.01.a).

(b) Minors who might receive a deep dose equivalent greater than 0.1 rem, a lens dose equivalent greater than 0.15 rem or a shallow dose equivalent greater than 0.5 rem. For Idaho, a minor who is likely to receive a quarterly dose in excess of 5% of the specified values in IDAPA 16.02.27 (110.01.a) must be monitored for external exposure.

(c) Declared pregnant women likely to receive a deep dose equivalent in excess of 0.1 rem during the entire pregnancy.

(d) Individuals entering high or very high radiation areas.

All radiation users who are subject to general whole-body exposures are issued "whole body dosimeters" and are classified as badged personnel by the EH&S department. Conceptually we always want data, even if there is low probability of measureable exposure. Negative or zero data may be extremely valuable and should be collected. Having measured data avoid the necessity for speculation in the absence of data.

Extremity dosimeters (finger or ring badges) are required when significant quantities of radioactive materials that emit radiation must be directly handled routinely, or when the hands or fingers could be accidentally exposed to a high intensity source such as an x-ray diffraction unit, and are also employed at the discretion of the RSO. Typically, extremity dosimeters will be employed when the anticipated extremity dose is two times greater than the anticipated whole body dose or when there is a potential for an abnormally large extremity dose.

## **B. PURPOSE**

The purpose of this procedure is to describe the steps involved in the various tasks pertaining to the issuance and maintenance of radiation worker dosimetry and dosimetry records.

## **C. REQUIRED MATERIAL(S)**

Various

## **D. PROCEDURE**

The procedures related to dosimetry are presented in the following 8 sections:

1. BOX
  - a. Important Folders
2. Radiation Safety Training
  - a. Initial Radiation Safety Training
  - b. Refresher Radiation Safety Training
3. Personal Dosimetry
4. Dosimeters
  - a. Issuing Radiation Dosimeters
  - b. Landauer Web Site
  - c. Switching Dosimeters
  - d. Dosimeter Shipments
5. Dose Reports
  - a. Submitting Dose Reports
  - b. RSC Meeting Quarterly Dose Reports
6. Dose History
  - a. Dose History Requests
  - b. Dose History Reports
7. Filing
  - a. Computer Based Filing
  - b. Dose Reports Filing
  - c. Archiving Radiation Worker Files
8. Declaration of Pregnancy
9. Medical Radionuclides
10. Lost Dosimeter
11. Unexpected High Exposure

Each of these procedures is explained in detail below.

## 1.(BOX)

BOX represents the Cloud Data Storage available to ISU users. BOX has been approved by the University IT group as a secure storage location for all data types that is in compliance with all current rules and regulations.

### a. *Important Folders*

After accessing BOX for the EH&S department, dosimetry information is organized within the Radiation Safety Program sub-directory. Within the folder labeled, "Dosimetry," there is access to all necessary documents pertaining to this procedure.

The "Dose History" folder contains cover letters for requesting and sending dose history reports, and NRC Form 5 comment options. This folder also contains the "Annual Report" document pertaining to employees who have exceeded their dose limit for the year

The "Procedures" folder contains a copy of these procedures.

The "Contact Information" folder contains ways in which to contact Landauer, Inc.

The "Dosimeters" folder contains documents pertaining to dosimeter assignment, current and old employee lists, dosimeter change out lists, locations of area and environmental dosimeters, unreturned dosimeters, and deactivation reminders.

The "Stickers and Labels" folder contains formatted documents for address, shipping, personnel folder, and general folder labels and stickers.

In the folder labeled, "Exposure Reports," there is access to quarterly exposure reports for the Radiation Safety Committee.

## 2. Radiation Safety Training

All students and employees who might receive doses greater than 10% of the occupational dose limits are required to complete ISU's online Radiation Safety Training course. The online training course is available at:

<https://www.isu.edu/ehs/radiation-safety/#Radiation%20Safety%20Training>

Radiation workers are required to get more specific training from their Authorized User regarding the particular experiments, materials, and equipment they will be working with in their research. a. *Initial Radiation Safety Training*

This training must be completed before any student or employee receives a dosimeter. As per instructions at the end of training, the participant is required to print the "Congratulations" page and/or send the e-mail that confirms completion of the training. An email should be sent automatically to a special EH&S account upon completion of training by any individual, however, this sometimes fails and so the backup hard copy is encouraged.

## b. Refresher Radiation Safety Training

A year after receiving the "Initial Radiation Safety Training," each radiation worker will be notified by e-mail to take the annual on-line refresher training. The refresher training URL is (this URL needs to be provided in the submitted e-mail):

<https://www.isu.edu/ehs/radiation-safety/#Radiation%20Safety%20Training>

The on-line training can also be found on the main web page of the EH&S Department.

The list of the radiation workers, who are due to receive refresher training are located in the EH&S [m1] database. To find the list, follow these steps:

The list of the radiation workers, who are due to receive refresher training are located in the EH&S database. To find the list, follow these steps:

1. Run the EhsSql.exe
2. Enter user ID and password
3. Click on "Health Physics," then on "Compliance"
4. Choose "Training"
5. Click on "Training Reports"
6. Training Delinquency options can be selected by course, by P.I., etc. It is best to select the training delinquency by Departments.
7. Select the "Pick Your Own" option and select your stop date; (usually the first date of next month).

The results of the refresher training will be submitted automatically to the EH&S mailbox. This result should be printed and filed in each employee's personal file. The EH&S database training dates must also be subsequently updated.

## 3. Personal Dosimetry

A folder must be prepared for each new radiation worker that includes the following items:

1. Radiation Introduction Training results
2. Personal information (Form RPR 1A)
3. Dose history (Form RPR 1B). For persons previously monitored in other facilities, this must be requested from the previous employer
4. Annual dose reports at ISU (these should be added to each personal file at the end of every calendar year)
5. Other relevant documents

The folder must be labeled with the individual's name. To print out a label for the new personal file, type the employee's name into the label document (a word document) found in the "Stickers and labels" folder available in *EH&Sshare*. Use the Avery 5160 labels, New Roman font, and size 18. Format the label so that the text is centered along the top of each label. Each label should contain the following information:

1. The Program file series (S70 Bengal ID)
2. Last Name, First Name

*Note: The completed "Dosimetry Assignment Check Sheet" should be filed in the visitor's folder which is placed close to personal dose reports.*

#### **4. Dosimeters**

##### *a. Issuing Radiation Dosimeters*

Prior to issuing any dosimeter, all the required documents including the result of the Radiation Introduction Training, completed. The "Dosimeter Assignment Check Sheet" and RPR 1 forms (available in *BOX* and also online) need to be submitted to the EH&S. Once the paperwork is completed, a dosimeter can be assigned to the individual who is required to be monitored at ISU. Please refer to the instructions for "Issuing Badges for Radiation Workers" in Section b.

##### *b. Landauer Web Site*

#### ***Changing the Username, Password, Units or Other Information***

In order to change any information such as first name, last name, units of doses, username, password, etc., the following steps should be followed:

1. Log into the system using current username and password
2. Go to the administration section on the side bar.
3. Follow appropriate prompts to make changes as necessary.
4. Be certain to: "Save changes" before exiting.

#### **Creating New Series of Dosimeters**

Although it has not been necessary to create a new series of badges for several years, doing so may be accomplished as authorized by the RSO in the following way.

1. Go to *Client Management*
2. Access *Account Maintenance*
3. Select: *Maintenance Subaccount*
4. Choose: *add a new subaccount*

*Current Landauer Series of Dosimeters at ISU*

The dosimeters at ISU are under the series illustrated in the following table:

<b>Location</b>	<b>Series</b>
General Physics	GPH
EML employees	EML
IAC workers	IAC
Beam Lab (Phys. Sci. Bldg)	BLB
Airport workers	AIR
Merrill Clifton	CEN
Biology Dept.	BIO
Engineering	ENG
Geology Dept.	GEO
Pharmacy Dept.	PHA
ENVIRONMENTAL Monitors	EMN
Radiological Sci.	RSC
Student Health Center	SHC
EH&S employees	EH&S
TEMPORARY AREA Monitors	TMP
ISIS workers	ISI
Chemistry	CHE
CAES (Idaho Falls)	CES
Idaho State	RIS

## Issuing Dosimeters for Radiation Workers

Before physically giving a dosimeter to an individual for the first time, the following information should be discussed:

1. Type(s) of dosimeter assigned.
2. Proper placement of dosimeter on the body.
3. Proper storage of dosimeter when not in use.
4. How and when dose information is reported.
5. How to request dose information.
6. How to report Medical Radionuclide administration
7. How to report a lost dosimeter.

Once all the paperwork is completed, a temporary (SPARE) dosimeter can be issued to be used until the end of that wear period. The person's name should be written on the badge with a permanent marker or sticker printed out and affixed to dosimeter with person's name. The person's information should also be entered in the Landauer database. The Landauer online account is at:

<https://esolutions.landauerinc.com/>

The following steps should be taken to enter the person's information in the Landauer database (one may go to landauer.com, esolutions and then LISN):

1. Login and select on of the following options: Add, Change, or Deactivate,
2. Enter the person's name, DOB, gender, and select add new participant and choose the "Next" option.
3. DO NOT enter a Participant Number (this will be generated automatically).
4. Click on "Next".
5. Select the appropriate subaccount for the individual and choose "Next".
6. Select the type of dosimeter they will need and the number of dosimeters needed, completing this section by selecting "Next".
7. Select the dosimeter location and choose "Next".
8. Click on the ASSIGN SPARE button. A separate window will appear where you must enter the first 8 characters (7 numeric, 1 alpha) of the serial number from the temporary dosimeter you assigned to the person (this is the number just above the bar code on the back of the badge).
9. Confirm all the information is correct and then select save.

10. Confirm that you are transferring the dose information from the correct temporary badge for the appropriate wear period. The Begin Date should automatically be the first day of that wear period while the end date should be blank, do not change it. Select the assign button.
11. Write the participant number in "Dosimeter Assignment Check Sheet."
12. Save all changes and logoff (end session, without summary, exit, close the browser).

*Note: All of the ISU temporary badges are T's, but not all of the radiation workers are given T badges for permanent use, so while trying to assign a temporary dosimeter to someone who will be receiving a P badge you get an error. To avoid this problem, change the person's Dosimeter Type in the Dosimeter Information section to T and click on SAVE. Then highlight the row and click on ASSIGN SPARE and follow the directions above. Once the assignment is made, switch the person's regular Dosimeter Type back to P and click on SAVE again.*

**NOTICE:** Be sure to make all temporary badge dose reassignments before you send the badges off to be read, otherwise the changes will not be reported!

## **Dosimeter Information**

### *Dosimeter Type*

Depending on the type of radioactive sources or radiation producing devices that are going to be used in each laboratory, an appropriate dosimeter needs to be assigned to the corresponding individuals. The different types of dosimeters in Landauer are as follows:

- Type P, for whole body beta/gamma/x-ray exposures
- Type J, for whole body beta/gamma/x-ray/low energy neutron exposures
- Type Ta, for whole body beta/gamma/x-ray/low and high energy neutron exposures
- Type U, for extremity beta/gamma/x-ray exposures (ring dosimeter)

Radiographic Sciences workers, Biology workers (except those who work at the IAC), Student Health Center workers, Geology workers, and Pharmacy workers all get type P badges. Everyone else gets type Ta badges. Area and Environmental monitor badge types will vary with location and can be either P or Ta type. Currently, there is no type J badge at ISU.

Ring badges should be assigned to those who work in Geology, Biology, and other places where appropriate. All those who get ring badges should receive a whole body dosimeter as well.

#### *Body Code*

ONLY one of the following codes should be used:

01: for whole body badges to be worn on the chest (for everyone except Radiographic Sciences)

13: for whole body badges to be worn on the collar outside of the lead apron (only for Radiographic Sciences)

19: for area/environmental monitors

17: for fetal monitors

03: for rings to be worn on the RIGHT hand (default)

04: for rings to be worn on the LEFT hand

#### *Frequency*

The dosimeters for radiation workers who need to be monitored for external exposure at ISU are on a quarterly exchange schedule (N). New badges will be issued for the first of January/April/July/October. When a new radiation worker is added, his/her first badge will arrive with the next badge shipment.

If a fetal monitor is required, a monthly (M) exchange needs to be selected.

#### *Holder/Size*

Badge holders may be ordered ONLY if needed. Rings are issued with a Medium size by default. People may be asked to try other sizes and a small or large size should be ordered if required.

#### *1st Wear Date to Ship*

This is the date of the first badge shipment for a person. If changes are made to a person's data (i.e., change their series, badge type, etc.) this date will NOT be changed.

#### *Active / De-active*

This field indicates when a person is currently wearing a particular badge. When a worker no longer needs to be monitored or no longer works at ISU, it is best to cancel their account by clicking on

DEACTIVATE ALL rather than by selecting D in the drop-down menu for each badge.

*Note: Once an individual has been entered into Landauer's database, he/she will receive a dosimeter with the individual's name on it for the following quarters, and will also receive an annual dose report at the end of the calendar year. If a worker needs to wear a dosimeter temporarily (i.e., researchers at IAC, or summer students), the procedures in 13.6.6 should be followed.*

The senior staff member responsible for dosimetry should conduct audits at least semi-annually to remove dosimetry no longer used because individuals to whom the dosimetry was assigned have left ISU.

### **Issuing Dosimeters for Temporary Radiation Workers/Visitors**

If an individual is classified as an observer based on the "Policy for issuing temporary badges," he/she needs to receive a DRD (Direct Radiation Dosimeter) available from the EH&S. The serial number of the DRD at the time of check in and checkout must be recorded in addition to the dose received.

When an individual needs a personal dosimeter for only a short period of time, a temporary badge (spare badge) can be issued via the following procedure:

1. The result of the Radiation Introduction Training as well as the completed forms including Forms RPR 1A and RPR 1B (if required) need to be submitted to the EH&S prior to issuing a badge.
2. The "Dosimeter Assignment Check Sheet" should be filled out by the radiation worker. This form is available on-line and also in the *EH&S BOX system*.
3. The required information including the number of the temporary badge and its barcode must be mentioned in the appropriate part of the "Dosimeter Assignment Check Sheet."
4. The person's name should be written on the badge with a permanent marker.
5. The computer databases need to be updated.
6. If a worker needs to receive a badge just for a single quarter, the following steps should be taken, so that this individual will not receive a dosimeter for the next quarter but will still receive an annual report at the end of the current year:

- a) Add a new dosimeter
- b) Set up the body code, series, frequency, etc.
- c) Before saving the new dosimeter, change the "1st Wear Date to Ship" to the first day of the following quarter, only if it is before the 5th of the last month of the current quarter. Otherwise you need to change the "1st Wear Date to Ship" to the first day of the next

two quarters. For example, if you are adding a new dosimeter on 12/04/07, you need to change the "1st Wear Date to Ship" to 01/01/08. When you save these changes, and then deactivate the dosimeter, the Landauer computer system will automatically show the deactivation date of 12/31/07 and it will not generate a new dosimeter for the following quarter. But if you are adding a new dosimeter on 12/05/07, you have to change the "1st Wear Date to Ship" to the 04/01/08. After deactivating this dosimeter, the system will show the deactivation date of 03/31/08 and will not generate a new dosimeter for the last quarter of 2008 again. In fact the deactivation date should always be before the date of next shipment. Be careful that all these changes are done prior to saving the new dosimeters. If a new dosimeter is added and saved, the changes of the "1st Wear Date to Ship" will no longer be effective.

If there are any problems, Landauer may be contacted about deactivations by e-mail ([irios@landauerinc.com](mailto:irios@landauerinc.com)). Do not forget to provide Landauer with the participant number and name of the worker, as well as the ISU account number while requesting the deactivation of badges.

### **Issuing Fetal Dosimeters**

When a woman declares a pregnancy she is issued a monthly fetal monitor in addition to her regular dosimeter(s). The fetal monitor is to be issued under the same series as the regular dosimeter(s). The following steps should be followed for issuing a fetal dosimeter:

1. Update the Landauer online account at:

*<https://esolutions.landauerinc.com/>*

2. Login and click on CHANGE

3. Search for her file by last name and confirm that you have found the correct person before clicking on SELECT.

4. In the Dosimeter Information section, click on ADD NEW DOSIMETER and enter the type of dosimeter that needs to be issued. Select the same dosimeter type and series as the worker's regular dosimeter, but enter body code 17.

5. Choose the monthly exchange frequency

6. In the personal information section, click on Pregnant. A series of new fields will appear prompting you to enter the declaration date, etc. Fill this out as completely as possible

(i.e. if only the month and year of conception are given, chose the first of the month for the day field).

7. Highlight the row in the Dosimeter Information section that corresponds to the type of temporary dosimeter you issued (fetal dosimeter in this case).
8. Click on the ASSIGN SPARE button. A separate window will appear where you must enter the first 8 characters (7 numeric, 1 alphabetic) of the serial number from the temporary dosimeter that has been assigned to the person (this is the number just above the bar code on the back of the badge).
9. Confirm that you are transferring the dose information from the correct temporary badge for the appropriate wear period. The Begin Date should automatically be the first day of that wear period while the end date should be blank, so do not change it.
10. Click on the “assign” button
11. Save all changes and logoff (end session, without summary, exit, close the browser)

The issued spare badge will be used until the end of the month. Landauer must be contacted to have the information on the SPARE badge changed to reflect that it was issued as a fetal monitor.

*NOTE: Explain that the fetal monitor must be worn in the belly area and that it will be exchanged monthly. The EH&S should also be informed when the badge can be cancelled.*

## **Deactivating the Dosimeters**

When someone no longer needs to receive a personal dosimeter, the following steps have to be followed:

1. Update the Landauer online account at:  
<https://esolutions.landauerinc.com/>
2. Login and click on either: ADD, CHANGE, or DEACTIVATE
3. Search for his/her file by last name and click on search
4. Select: “View/Edit”.
5. From the list of dosimeters select the option: Edit Dosimeters”.
6. Select “Deactivate” for the dosimeter that you wish to deactivate or alternately one may deactivate an entire group by selecting “Deactivate All”.
8. Click on SAVE
9. Click on END SESSION – WITHOUT SUMMARY
10. Click on EXIT

## **Re-Ordering Spare Badges**

When half of the spare badges have been used, additional spare badges for the same quarter can be obtained using the “Use Live Chat” option.

### *c. Switching Dosimeters*

Dosimeters are switched on a monthly and quarterly basis. Fetal badges, environmental

monitors and airport area monitors are switched monthly. All other dosimeters are switched quarterly. Chains of custody (COC) have been created for each series. The excel document that contains the chain of custody is called "ChainofCustody" and can be located on the dosimeter folder within BOX.

The chains of custody should be used in the following manner, every month and/or quarter when switching badges:

1. Open the "ChainofCustody" document found on EH&Sshare
2. Print out chains of custody for every dosimeter series including Area & Environmental monitors.
3. Against each name, check "Old Returned" if you receive the person's old badge; "New Given" if you gave him/ her a new badge, and/ or "Not Used" if the old badge was not used.
4. Make any notes in the "notes" section. This is optional.
5. Sign and date the chain of custody after switching the badges
6. Make all necessary changes on the Landauer database, and EH&S based on the information on the currently filled chain of custody.
7. Clip the chains of custody together and file them in the "Chain of Custody" folder of the S80 folder series (S80 COC) for one year before discarding.

**Note:** *If someone other than the EH&S employee managing the dosimetry program is assigned to switch badges, they have to follow step 1 to 4 above, sign and date the "SWITCHED BY" portion of the COCs. After the EH&S employee receives these badges and COC(s), he/she has to verify the badges and COC(s) for accuracy, sign and date the "VERIFIED BY" portion of the COC. This document has to be filled for one year before discarding.*

#### *d. Dosimeter Shipments*

After receiving new dosimeters, all used/unused badges must be collected and must be sent to the provider (currently Landauer). All the control badges should also be sent at the same time. Sending letters with badges is not required.

DO NOT MISS any of the used badges. To make sure all the badges have been collected, follow the steps in section (c) above. The "Final Check sheet" should be used. This sheet is found on the "ChainofCustody" document. For each series, the dosimeters, controls and rings portions should be checked accordingly when grouping badges of the same series in envelop for shipping.

To return the old badges, choose an appropriate box and carefully place the badges in the box, so that they will be transported without receiving any mechanical shock or physical damage. The initial package that contained the new dosimeters can be used for this purpose.

The following label should be posted on the box:

**Handle Carefully!**  
**Monitoring Devices Enclosed**  
**Keep Away from X-ray and Radioactivity**

Addresses of the sender (EH&S) and receiver (i.e. Landauer) should be labeled clearly.

The addresses are available in the "Address Stickers" file of the Stickers folder in *BOX*.

The code **AENV01** at the end of EH&S's address is necessary for all shipments. The box should be brought to the post office by the EH&S staff.

## **5. Dose Reports**

### *a. Submitting Dose Reports*

Duplicate quarterly dose reports are usually provided by the dosimeter provider (currently Landauer). They do not include social security numbers and should be given to the Radiation Safety Officer to be submitted to the Radiation Safety Committee Members during the quarterly meetings.

The annual dose reports for doses up to and exceeding 100 mrem must be mailed in sealed envelopes to each radiation worker along with a cover letter are generated by the use of the Radiation Workers' Master List available in EH&S software.

On-campus mail does not need postage. They can be submitted directly to the secretary of each Department in a unique large envelope containing individual's sealed dose reports to maintain confidentiality. Only off-campus mail requires postage and should be sent directly to the corresponding individuals.

### *b. RSC Meeting Quarterly Dose Reports*

A quarterly dose report should be prepared for the Radiation Safety Committee Meeting.

## **6. Dose History**

### *a. Dose History Requests*

A radiation worker who requests a copy of their dose history must fill out Form RPR 1B and submit it to the EH&S. This form is subsequently mailed to the relevant institution/company along with a formal letter prepared by the EH&S. EH&S letterhead and printed envelopes must be used for the formal letter. A photocopy of the above-mentioned letter and the completed Form RPR 1B should be added to the individual's file.

### *b. Dose History Reports*

Upon receiving a request for dose history from an individual, a formal letter, an NRC Form

5, and a written request should be sent back to the requesting institution. The NRC Form 5 can be found at:

<http://www.nrc.gov/reading-rm/doc-collections/forms/nrc5.pdf>

Each numbered box in NRC Form 5 should be properly filled in. The licensee name in box seven (7) is "Idaho State University (ISU)"; the Broadscope license number is 11-27380-01. The Manufacturing License number is 11-27380-04. The form needs to be signed by the Radiation Safety Officer. Photocopies of these documents should be subsequently placed in the individual's file to be archived for ISU records.

## **7. Filing/Archiving**

### *a. Computer Based Filing*

Once a file is prepared for a radiation worker, his/her complete information must be entered in the following three computer data bases:

#### **Landauer**

See 4. Dosimeters, section b

#### **EH&S Assistant**

1. Run EhsSql.exe file (available as a shortcut on the desktops of the EH&S computers)
2. Login with appropriate username and password
3. Choose "Lab Workers" option
4. Click on "Add New Worker"
5. Add the worker's name and complete personal information plus all required data such as e-mail address, phone number, complete mailing address, dosimetry status, supervisors/PI, trainings, etc.
6. Save
7. Exit

*Note: The information of all workers/students who have received permanent dosimeters (not just for a single quarter) should be entered in this database, including those that do not require monitoring but must take the refresher training every year (students in Physics and Engineering Buildings and individuals working with alpha, low energy beta-emitters, or small sources in a class-setting). It will help to have them on this list when they are due to take the refresher training.*

#### **BOX**

The list of workers also needs to be updated in *the appropriate BOX file*. Follow these steps:

1. Open the "Dosimetry" folder in *BOX*
2. Open the "Dosimeters" folder
4. Open the "ChainofCustody.xls" file
3. Enter all required information for the worker in the appropriate chain of custody series in alphabetical order.

*Note: The participant number is the one in Landauer's database.*

## *b. Filing Dose Reports*

### **Quarterly/Monthly Dose Reports**

Quarterly dose reports should be filed by the names of the ISU Departments and in alphabetical order. Each area and environmental monitor report should be filed separately. It is preferable to keep the monthly reports separate from the quarterly dose reports.

### **Annual Dose Reports**

Once the annual dose report arrives from the provider (currently Landauer), a copy of each individual's annual dose report should be filed in their personal folder. The annual spare badge reports can be discarded. The annual area and environmental reports should be filed separately in the associated file cabinet located in Room 101A.

## *c. Archiving Radiation Worker Files*

When someone is no longer a radiation worker at ISU, his/her personal dosimeter is deactivated and the relevant personal file is archived in Room #103.

The following steps should be taken prior to archiving radiation workers' personal files:

1. The personal dosimeter of the individual should be deactivated in the Landauer database (see 4. Dosimeters, section b).
2. The worker should be archived in the EH&S database as follows:
  - a. Run EhsSql.exe file (available as a shortcut on EH&S computer's desktops).
  - b. Login with the appropriate username and password.
  - c. Find the workers name in the "Lab Workers" option.
  - d. Click on "Archive."
  - e. "Exit" when you are done to save.
3. This person should then be taken off of the list of current workers in the chain of custody file stored in BOX:
  - a. Open "Dosimetry" folder in BOX
  - b. Open "Dosimeters" folder
  - c. Open the file entitled "ChainofCustody.xls"
  - d. Open the appropriate series worksheet
  - e. Take the personal information of the individual off of the list of the current workers.
4. Take the individual's folder off of the file cabinet in Room 101A, transfer it to the file cabinets in Room 103 and place it in alphabetical order.

## 8. Declaration of Pregnancy

A female radiation worker may voluntarily declare her pregnancy at any time during her pregnancy.

1. Have the individual fill out a signed letter for declaring with her name, the name of her current supervisor or series code, the approximate date on which she became pregnant and the date of her declaration. This letter is available online at:

<https://www.isu.edu/ehs/radiation-safety/>

2. Refer a woman who declares her pregnancy to the relevant information concerning the health issues related to being exposed to radiation during pregnancy through email. Regulatory Guidelines pertinent to these individuals are available online at:

Reg. Guide 8.13 "INSTRUCTION CONCERNING PRENATAL RADIATION EXPOSURE"  
[http://www.physics.isu.edu/health-physics/EH&S/rad\\_training/8\\_133.pdf](http://www.physics.isu.edu/health-physics/EH&S/rad_training/8_133.pdf)

Reg. Guide 8.36 "RADIATION DOSE TO THE EMBRYO/FETUS"  
<http://www.nrc.gov/reading-rm/doc-collections/reg-guides/occupational-health/rg/8-36/>

3. Print out a copy of the email sent and put it in her file.
4. Issue a fetal dosimeter in accordance with the procedure detailed in part 4 section b of this procedure.

## 9. Medical Radionuclides

Occupational dose does not include dose received via diagnostic or therapeutic exposure to radionuclides. Workers should inform the RSO or appropriate ES&H staff if he or she is going to be exposed to, or receive unusual diagnostic or therapeutic treatments involving the use of radionuclides.

Workers should be advised on the importance of consulting with the RSO for determination of appropriate use of dosimetry prior to the administration of medical radionuclides.

## 10. Lost Dosimeters

If a worker loses their dosimeter the following actions should be completed to assist in estimating their dose:

1. Interview the worker who has lost their dosimeter. Ask questions such as: What are your work duties, when was the dosimeter was lost, who performs similar work in their organization?
2. Review the dose of individuals that have similar work duties in the same radiation areas.
3. Review the closest area dosimeter result for the appropriate time period,

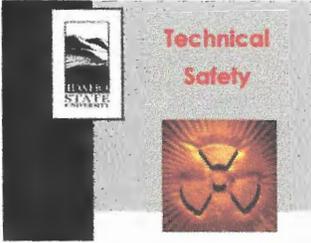
4. Generate a report with assumptions and methods for estimating the worker's dose, and submit to RSO for approval.

### **11. Unexpected High Exposure**

The RSO or designee along with the RSC will review each incident for determination of appropriate actions. Unexpected high exposures are defined by exceeding ISU's ALARA limits.

### **REFERENCES**

10 CFR 20



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Procedure Title: Dosimetry  
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## REVISION TRACKER

Revision 3 April 13, 2011 Original Procedure