

RI-44

RADIATION USERS' SAFETY TRAINING

PURPOSE

This procedure prescribes the training in radiation protection required for all individuals who may be exposed to ionizing radiation in the course of their official duties. The content and frequency of training sessions are specified for each category of radiation user (see the Radiation Control Manual).

RULES AND REGULATIONS

Regulations governing the possession and use of radioactive materials and other radiation sources require that every individual working with or in the presence of such sources be instructed in the applicable provisions of regulations and license conditions, in the potential health problems associated with exposure to radiation, in the precautions and procedures required for safe use of radiation, and in the proper use of protective and measurement devices. The extent of the training is to be commensurate with the potential risk of radiation exposure to the individual.

The primary responsibility for providing adequate training for individuals who work routinely with radiation sources rests with the Principal User. For individuals who are only occasionally exposed to radiation, e.g. most nurses, housekeeping, maintenance, security and delivery personnel, the responsibility for training lies with their supervisors. Generally, the Principal User or supervisor will fulfill this responsibility by assuring that each person attends the appropriate training offered by the Radiation Control Office (RCO). The Principal User may also be required to provide training and submit a statement to the RCO listing the individuals trained and the content of the training.

The RCO is responsible for developing, conducting and documenting training on radiation protection applicable to all categories of radiation users. For each category of user, the RSC shall establish an appropriate schedule or frequency and the minimal requirements for content of the program. The RCO shall maintain appropriate records of training offered and completed to assure compliance with regulatory requirements.

TRAINING CONTENT

Module 0 (Orientation): All personnel that will be in the presence of licensed ionizing radiation shall go through orientation. A test for this module is not required, but a signed certification stating that the individual has read the Radiation Control Manual and understands their responsibilities is required before certification is granted. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce the Colorado Department of Public Health and Environment (CDPHE) - Rules and Regulations Pertaining to Radiation Control and the CSU Radiation Control Manual.
2. Introduce the CSU radiation safety organization and structure (Administration, Radiation Safety Committee, Principal User, Project Applications, Individual Users).
3. Provide a basic awareness of types of radioactive material, their use and places used on the CSU campus.
4. Provide awareness of postings that might be encountered on the CSU campus.
5. Provide a basic understanding of health effects, the linear no threshold model and comparisons with other activities.
6. Present and explain the principle of ALARA.
7. Introduce protective devices relative to radiation safety.
8. Introduce part 4 and part 10 of the Colorado Department of Public Health and Environment (CDPHE) - Rules and Regulations Pertaining to Radiation Control.
9. Introduce the Notice to Employees and the CSU license(s).
10. Introduce the reporting responsibilities for unsafe conditions concerning radiation and emergency procedures.
11. Introduce general warnings and the emergency responders role and instructions.
12. Provide a list of what reports are available to the individual and that personnel files are confidential.
13. Advise users of additional training required for radiation use.

Module 1 (Safety and Radiation): All users that are classified as Normal, Qualified, Principal or Irradiator shall be instructed on specific conditions that could involve exposure, and proper procedures for avoiding unnecessary exposure. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Present basic definitions and energy units relative to radiation.
2. Advise individuals of the meaning of radiation warning signs.
3. Introduce time, distance and shielding and how these can be used with the ALARA principle.
4. Advise individuals of the responsibilities and rights of individual employees by reviewing the Notification to Workers.
5. Advise individuals of dose limits.

6. Introduce the CSU personnel dosimetry program.
7. Provide safe handling techniques when using radioactive material.
8. Introduce proper PPE, equipment and their use.
9. Introduce engineering controls that may be encountered at CSU.
10. Provide risk estimates and syndromes of acute exposures.
11. Discuss lab records.

If an individual has had previous training, a challenge test may be taken to pass out of this module. To take a challenge test, contact the RCO. If the challenge test is not passed with a score of 80% or more, the module must be attended and all requirements must be met.

Module 2 (Basic Radiation Principles): All users that are classified as Normal, Qualified, Principal or Irradiator. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce characteristics of radiation sources.
2. Introduce biological effects and risk estimates from radioactive material.
3. Provide training on monitoring of external exposure using survey meters and wipe tests.
4. Discuss ALI tables and values.

If an individual has had previous training a challenge test may be taken to pass out of this module. To take a challenge test, contact the RCO. If the challenge test is not passed with a score of 80% or more, the module must be attended and all requirements must be met.

Module 3 (Radioisotope Acquisition and Disposition): All personnel that are classified as Qualified, Principal or will be acquiring or disposing of radioactive material. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce State procedures for receiving and opening packages.
2. Introduce State procedures for storage and security of radioactive material.
3. Provide training and forms for receipt of radioactive material.
4. Provide training and forms for inventory records.
5. Provide training and forms for waste segregation, packaging and disposal.
6. Discuss shipment of radioactive materials.

Module 4 (In Lab Verification): All personnel except Ancillary. An oral evaluation for this module is required to be attended before certification is granted. The RCO personnel giving the oral evaluation will update individuals on changes in training from modules 0, 1, 2, 3, 5, 6, 7, 8, 9 and may be required to attend one of these modules if the RCO personnel believes that the individual needs further training. This module has a training frequency of once every 3 years. Training outline (RF-44B) forms with items discussed are provided in these instructions for different types of use classifications.

The objectives of this course are to:

1. Evaluate training by performance based examination of laboratory procedures and safety.

Module 5 (Dosimetry): All users that are classified as Qualified or Principal. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce the State rules and regulations regarding training.
2. Emphasize the Radiation Safety Committee requirements.
3. Inform individuals of the CSU radiation application requirements for dose calculations.
4. Discuss why and how dose estimates compliment ALARA.
5. Provide information on external radiation dose calculations (CEDE).
6. Provide calculations and examples for internal radiation dose calculations.
7. Provide calculations and examples for total dose estimation calculations.
8. Methods of reducing exposure.

If an individual has had previous training a challenge test may be taken to pass out of this module. To take a challenge test, contact the RCO. If the challenge test is not passed with a score of 80% or more, the module must be attended and all requirements must be met.

Module 6 (Laboratory Radiation Safety Program): Principal users and designees. A test for this module is not required. Certification is granted upon attendance. This module is attended on a one-time basis.

The objectives of this course are to:

1. Discuss the responsibility of the Principal User to have an in-lab radiation safety program.
2. Discuss elements of a program.
3. Provide users with required laboratory record and documentation forms
4. Advise users how to use and complete forms
5. Inform users of required laboratory postings
6. Present the radiation use application forms and the required information needed in the applications
7. Inform users of required paperwork for shipment of small quantities of radioactive materials
8. Advise users on housing and handling of animals in radiation experiments.
9. Inform users of the specifics of RCO quality assurance and quality control audits.

Module 7 (Irradiators): Irradiator users. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Inform users of requirements for safety devices.
2. Inform users of required postings.
3. Provide additional information on State requirements for irradiators including wipe tests, operator training, etc.
4. Introduce case histories.

If an individual has had previous training a challenge test may be taken to pass out of this module. To take a challenge test, contact the RCO. If the challenge test is not passed with a score of 80% or more, the module must be attended and all requirements must be met.

Module 8 (X-ray Machines): X-ray machine users, including users of special radiographic or fluoroscopic procedures. A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce the state rules and regulations for training of individuals using x-ray machines.
2. Advise users of the location of x-ray units at CSU.
3. Introduce methods to minimize x-ray exposure.
4. Introduce section 6 of the Colorado Department of Public Health and Environment, Rules and Regulation Pertaining to Radiation Control.
5. Advise users of required machine warnings.
6. Inform users where to place dosimeters to monitor partial-body exposures.
7. Introduce characteristics of radiation sources.
8. Present basic definitions and energy units relative to radiation.
9. Advise individuals of dose limits.
10. Provide risk estimates and syndromes of acute exposures.
11. Introduce characteristics of radiation sources.
12. Advise individuals of the meaning of radiation warning signs and required postings.
13. Operation of x-ray machines.
14. Dose calculations for x-ray machines.

If an individual has had previous training a challenge test may be taken to pass out of this module. To take a challenge test, contact the RCO. If the challenge test is not passed with a score of 80% or more, the module must be attended and the module must be attended and all requirements must be met.

Module 9 (VTH Student): Veterinary Teaching Hospital Students, only students that have completed VM 714, Epidemiology and Environmental Health (Ionizing Radiation Protection Section). A test for this module is required to be passed with a grade of at least 80% before certification is granted. If the initial test is not passed with a grade of at least 80% a notification will be sent informing the individual that they have failed the test. A second test will be forwarded with the notification. If the second test is not passed with a grade of at least 80%, the individual will be sent another notification of failure and be required to attend the module again and retake

the test until a grade of greater than 80% is achieved. This module is attended on a one-time basis.

The objectives of this course are to:

1. Introduce the Colorado Department of Public Health and Environment (CDPHE) - Rules and Regulations Pertaining to Radiation Control and the Radiation Control Manual.
2. Introduce CSU radiation safety organization and structure (Administration, Radiation Safety Committee, Principal User, Project Applications).
3. Provide a basic awareness of types of radioactive material, their use, places used on campus and transfer of material.
4. Provide awareness of postings that might be encountered on campus.
5. Provide a basic understanding of health effects, the linear no threshold model and comparisons with other activities.
6. Introduce protective devices relative to radiation safety.
7. Introduce part 4 and part 10 of the Colorado Department of Public Health and Environment (CDPHE) - Rules and Regulations Pertaining to Radiation Control.
8. Introduce the CSU license(s).
9. Introduce the reporting responsibilities for unsafe conditions concerning radiation.
10. Introduce general warnings and that the emergency responders instructions have to be followed.
11. Provide a list of what reports are available to the individual and that the personnel files are confidential.
12. Provide guidance on who to call for information or assistance on radiation exposure situations and emergencies.
13. Advise individuals of the responsibilities and rights of individual employees by reviewing the Notification to Workers.
14. Introduce the CSU personnel dosimetry program.
15. Introduce engineering controls that may be encountered at CSU.
16. Introduce the state rules and regulations for training of individuals using x-ray machines.
17. Advise users of the location of x-ray units at CSU.
18. Introduce methods to minimize x-ray exposure.
19. Introduce section 6 of the Colorado Department of Public Health and Environment, Rules and Regulation Pertaining to Radiation Control.
20. Advise users of required machine warnings.
21. Inform users where to place dosimeters to monitor partial-body exposures.
22. Discuss why and how dose estimates compliment ALARA.
23. Operation of x-ray machines.

TRAINING FREQUENCY AND RECORDS

Radiation users are required to receive training prior to beginning work with radiation sources. Training received at another institution may be acceptable if it fulfills current requirements. The RSC establishes procedures for verifying and accepting training received elsewhere.

Form RF-44A is required to be completed by individuals at the time of training. This allows the RCO to insure that certifications and tests received from individuals have actually attended the training. The proctor or instructor will complete the bottom of the form.

Upon completion of the module training and receipt of the certification or passing of the module test, if required, a copy of the certification or test is retained in the permanent radiation user file for the individual and a certification is sent to the individual. The training is also entered into the RCO database for easy retrieval.

VISITORS

Visitors in radiation use areas must read the "Visitor Rules" (RF-44C) and complete the "Visitors Log" (RF-44D). The visitor must make an appointment and have a pre evolution briefing about the radiation use in the area either by the principal user or an authorized representative. The visitor must understand the required PPE, dose limits applied to them, exposure implications, dosimetry requirements and read and understand the ALARA rules.

RF-44A RADIATION SAFETY TRAINING COURSE ROSTER

No	Last Name, First Name	CSU ID No.	Phone	Department Address	Principal User	Signature
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Course Title: _____ **Module No:** _____

Course Date: _____ **Course Time:** _____ **Instructor:** _____ **Course No:** _____

RF-44A RADIATION SAFETY TRAINING COURSE ROSTER UNSCHEDULED MODULES

Last Name, First Name	CSU ID No.	Phone	Department	Principal User	Signature	Date	Entered Into Database

Course Title: _____ Module No: _____

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING

PERFORMANCE BASED VERIFICATION OF TRAINING

Date: _____ Principal User: _____

Signature of RCO Personnel Conducting Interview: _____

Dispersible X-Ray Accelerator Sealed Sources Nuclear Gauges

Your Social Security Number will be used **ONLY** for identification purposes to track radiation dosimetry, training and other records maintained by the Radiation Control Office. The records are confidential and may not be viewed by anyone except for yourself and RCO staff. Providing your Social Security Number is done so on a completely voluntary basis. If you do not wish to provide your Social Security Number for RCO purposes, you must obtain an alternative CSU Identification Number from Human Resources Services (x5793) or Admissions (x6909) in order to complete this module.

I acknowledge that Module-4 verification of training was completed on this date and the results were discussed with me,

PLEASE PRINT CLEARLY

Last Name	First Name	Student I.D Last 4 Digits of SSN	Signature

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING

Date: _____

Principal User: _____

Dispersible Users

1. Discuss security used in the laboratory. (lock doors or RAD material from unauthorized users if absent longer than 10 mins.– what makes user 'authorized'). (Module-0, Module-3)

Completed N/A

2. Locate the Notification to Workers and explain what it contains. (Rights and responsibilities, chain of command, misuse – personal use, take home – a felony FBI contacted). (Module-1)

Completed N/A

3. Discuss the postings in the laboratory. (Module-6)

Completed N/A

4. Discuss the radionuclides in use in the laboratory, the type of radiation emitted and the type of instrument needed to detect the radionuclides. (Module-1, Module-2)

Completed N/A

5. Demonstrate a survey using the survey instrument in their laboratory (if applicable) (Module-2)

Completed N/A

Show them how to determine when the survey meter was calibrated.

Completed N/A

Show them how to use the calibration factor and why it is important.

Completed N/A

Are there quality control charts available for the survey meter(s) (ask to perform QA/QC check)?

No Yes N/A

6. Demonstrate a wipe in their laboratory. (Cut-off for contamination, (Module-2)

Completed N/A

Do they know the efficiency of the instrument used to count the wipe?

No Yes N/A

7. Locate the ALARA statement and discuss the items. (Time, Distance, Shielding).

Completed N/A

8. Discuss basic radiation safety relative to the procedures used in the lab. (Survey meter on during experiment, personal exit surveys, secondary containment, practice procedures, wipe outside of tubes before centrifuging, replace waste container lids after experiment). (Module-1)

Completed N/A

9. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (Don't wear any one elses, lost / late badges, late ring costs, exit survey – badge, area monitors). (Module-1)

Completed N/A

10. Verify that the individual(s) are wearing the proper PPE. (Module-1)

Completed N/A

11. Discuss secondary containment. (must use when working with / transporting materials).

Completed N/A

12. Verify that all individuals know where the laboratory records are and how to complete them. (explain both books, frequency of swipe tests, explain 'A', 'B' and 'C' form, send in 'C' form, transfers must be approved by the RCO, off-campus shipments must be done through the RCO)

Completed N/A

13. Discuss separation and disposal of waste. (Explain 'F' form, describe vial waste, must describe liquids on back of waste form, 3" headspace on carboys, no biohazard bags, well plates solid waste, close containers when finished adding waste – liners inside, lead, paint, batteries other 'mixed' waste)

Completed N/A

14. Give an example of an emergency and a non-emergency situation and discuss procedures. (Module-1)

Completed N/A

15. Review committed effective dose limits. (Module-1)

Completed N/A

16. Inform females of the state rules for pregnant workers. (must cancel badge in writing) (Module-0)

Completed N/A

17. Discuss the estimated dose that they may expect from doing the procedures they perform.

Completed N/A

18. Qualified, Principal Users - Does the individual know where to find information for determining dose to the skin? (Module-5)

Completed N/A

19. Qualified, Principal Users - Does/do the individual(s) know what the expected committed effective dose equivalent would be if 50% of the ALI was ingested for a radionuclides? (Module-5)

Completed N/A

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING

Date: _____ Principal User: _____

For Sealed Source Users Not Defined as an Irradiator

1. Discuss security requirements?

Completed N/A

2. Discuss possible hazards, significance of safety devices and step by step operating procedures for the source being used? (Project read and approval form signed)

Completed N/A

3. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause exposure to radiation. What is the response to the warnings?

Completed N/A

4. Discuss the estimated dose that they may expect from doing the procedures they perform.

Completed N/A

5. Discuss the radionuclides in use, the type of radiation emitted and the type of instrument needed to detect the radionuclides. (Module-1, Module-2)

Completed N/A

6. Give an example of an emergency and a non-emergency situation and discuss procedures. (Module-1)

Completed N/A

7. Review committed effective dose limits. (Module-1)

Completed N/A

8. Inform females of the state rules for pregnant workers. (Module-0)

Completed N/A

9. Locate the ALARA statement and discuss the items.

Completed N/A

10. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (Module-1)

Completed N/A

11. Locate the Notification to Workers and explain what it contains. (Module-1)

Completed N/A

12. Demonstrate a survey using the survey instrument in their laboratory (if applicable) (Module-2)
 Completed N/A
-

Show them how to determine when the survey meter was calibrated.

- Completed N/A
-

Show them how to use the calibration factor and why it is important.

- Completed N/A
-

Are there quality control charts available for the survey meter(s)?

- No Yes N/A
-

13. Discuss any exemptions that have been granted by the State.

- Completed N/A
-

14. Discuss leak test records and requirements.

- Completed N/A
-

15. Discuss posting requirements (Radiation Area - >5mrem/hr at 30 cm from source, High Radiation Area - >100mrem/hr at 30 cm from the source).

- Completed N/A
-

16. Access control requirements for high radiation areas.

- Completed N/A
-

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING

Date: _____

Principal User: _____

Analytical X-ray Users

1. Discuss security used in the facility. (Module-0)

Completed

2. Locate the Notification to Workers and explain what it contains. (Module-8)

Completed N/A

3. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (area monitors, Module-8)

Completed N/A

4. Locate the ALARA statement and discuss the items.

Completed N/A

5. Inform females of the state rules for pregnant workers. (Module-0)

Completed N/A

6. Review committed effective dose limits. (Module-8)

Completed N/A

7. Discuss basic radiation safety relative to the procedures. (Aligning the beam requires qualified user with ring badge, leaded goggles, apron and gloves, time distance, shielding) (Module-8)

Completed N/A

8. Are operating procedures available and discuss the estimated dose that they may expect from doing the procedures they perform. (Module-8)

Completed N/A

9. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause unexpected exposure. What is the response to the warnings? (Discuss interlocks if appropriate) (Module-0)

Completed N/A

10. Discuss x-rays and the type of instrument needed to detect the x-rays. (Module-8)

Completed N/A

11. Discuss the sources of radiation from x-rays (direct, tube leakage, scatter). (Module-8)

Completed N/A

12. Has the individual received training from the PU on the use of the machines being used? Is this training documented? (Module-8)

Completed N/A

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING

Date: _____ Principal User: _____

Diagnostic X-ray Users

1. Discuss security used in the facility. (Module-0)

Completed N/A

2. Review the technique chart that is required to be provided in the vicinity of the x-ray machine. (Module-8)

Completed N/A

3. Locate the Notification to Workers and explain what it contains. (Module-8)

Completed N/A

4. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (Module-8)

Completed N/A

5. Locate the ALARA statement and discuss the items.

Completed N/A

6. Inform females of the state rules for pregnant workers. (Module-0)

Completed N/A

7. Review committed effective dose limits. (Module-8)

Completed N/A

8. Discuss basic radiation safety relative to the procedures used in the facility including exposing individuals without approval from a licensed human practitioner, holding of patients (written safety procedures required), termination of exposure by a timer and the required 6 foot deadman switch from the patient for VTH purposes. (Module-8)

Completed N/A

9. Discuss the estimated dose that they may expect from doing the procedures they perform. (Module-8)

Completed N/A

10. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause unexpected exposure. What is the response to the warnings? (Module-0)

Completed N/A

11. Explain that individuals are required to wear 0.25 mm lead equivalency if closer than 2 meters to the tube head or the nearest edge of the image receptor. (Module-8)

Completed N/A

12. Verify that the individual(s) are wearing the proper PPE (useful beam not striking the body unless protected by 0.5 mm lead equivalent). (Module-1)

Completed N/A

13. Discuss x-rays and the type of instrument needed to detect the x-rays. (Module-8)

Completed N/A

14. Discuss the sources of radiation from x-rays (direct, tube leakage, scatter). (Module-8)

Completed N/A

15. Review Time, Distance and Shielding. (Module-8)

Completed N/A

For All X-ray Operators:

1. Has the individual received training from the PU on the use of the machines being used? Is this training documented? (Module-8)

Completed N/A

2. Are there operating procedures available? (Module-8)

Completed N/A

3. Has the individual been provided with written safety procedures? (Module-8)

Completed N/A

RF-44B MODULE 4 "IN LAB VERLFICATION" TRAINING OUTLINE

PERFORMANCE BASED VERIFICATION OF TRAINING

Module Course Number (Date): _____

For Accelerator Users

1. Discuss security used in the laboratory. (Module-0, Module-3)

Completed N/A

2. Demonstrate a survey using the survey instrument in their laboratory (if applicable) (Module-2)

Completed N/A

Show them how to determine when the survey meter was calibrated.

Completed N/A

Show them how to use the calibration factor and why it is important.

Completed N/A

Are there quality control charts available for the survey meter(s)?

No Yes N/A

2. Locate the Notification to Workers and explain what it contains. (Module-1)

Completed N/A

3. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (Module-1)

Completed N/A

5. Locate the ALARA statement and discuss the items.

Completed N/A

6. Inform females of the state rules for pregnant workers. (Module-0)

Completed N/A

7. Review committed effective dose limits. (Module-1)

Completed N/A

8. Give an example of an emergency and a non-emergency situation and discuss procedures. (Module-1)

Completed N/A

9. Discuss basic radiation safety relative to the procedures used in the area. (Module-1)

Completed N/A

10. Discuss the type of radiation emitted and the type of instrument needed to detect the emissions. (Module-1, Module-2)

Completed N/A

11. Discuss the estimated dose that they may expect from doing the procedures they perform.

Completed N/A

12. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause exposure to radioactive material. What is the response to the warnings? (Module-0)

Completed N/A

13. Has the individual been instructed on possible hazards, significance of safety devices and operating procedures for the accelerator being used? Is this training documented? (Module-7)

Completed N/A

14. Are there step by step operating procedures available? (Module-7)

Completed N/A

16. Discuss the sources of radiation from the accelerator (direct, tube leakage, scatter). (Module-8)

Completed N/A

17. Review Time, Distance and Shielding. (Module-8)

Completed N/A

18. Is there documentation at the control panel containing a description of the filters? Are the filters labeled? (Module-9)

Completed N/A

19. Can a filter selection be made at the control panel so that the accelerator can only be energized once the filter is selected? Is there an interlock to prevent irradiation if the filter is not selected? Is there an interlock to prevent irradiation if the filter selection in the treatment room does not agree with the control filter selection? (Module-9)

Completed N/A

20. Is there a beam monitor in the head of the accelerator? (Module-9)

Completed N/A

21. Locate the termination switches at the control panel and inside the treatment room. (Module-9)

Completed N/A

22. Are part 4 and 10, 20 of the State regulations available? (Module-9)

Completed N/A

23. Review safety interlocks required on entrances. Have they been checked to assure proper operation? (Module-9)

Completed N/A

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING OUTLINE

PERFORMANCE BASED VERIFICATION OF TRAINING

Module Course Number (Date): _____

For Irradiator Users

1. Are the leak test records complete and in order? (*RCO once every 6 months, Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

2. Has the individual been instructed on possible hazards, significance of safety devices and operating procedures for the irradiator being used? Is this training documented? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

3. Are there step by step operating procedures available? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2) N/A

4. Does the irradiator have adequate security? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

5. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause exposure to radiation. What is the response to the warnings? (*Module 7, operator training, discontinue use of irradiator, Call P.U.*)
 Completed N/A

6. Discuss the estimated dose that they may expect from doing the procedures they perform. (*Located in the project – find info with operator*)
 Completed N/A

7. Discuss the radionuclides in use, the type of radiation emitted and the type of instrument needed to detect the radionuclides. (*Beta, Gamma, half-life, Geiger counter, NaI detector*)
 Completed N/A

8. Give an example of an emergency and a non-emergency situation and discuss procedures. (*RCO considers anything operator considers as an emergency, Chirpie malfunction – non emergency, source stuck in on position - Emergency*)
 Completed N/A

9. Review committed effective dose limits. (*5 rem – whole body; 50 rem – extremities/organ or tissue; 15 rem – lens of the eye; 0.5 rem declared pregnant workers/occupational minors, 0.1 rem – general member of the public; Natural background in CO 0.45 rem*)
 Completed N/A

10. Inform females of the state rules for pregnant workers. *(Voluntary to declare pregnancy. Must do so in writing to P.U. & RCO, RI-03 located in Yellow BK and on website. Monthly badge to be worn on stomach. No more than 50 mrem per month RCO ALARA limit.)*

Completed N/A

11. Locate the ALARA statement and discuss the items.

Completed N/A

12. Verify that the individual(s) are badged, if required, and wearing the badge correctly. *(Wear between neck and waist closest to the source of radiation)*

Completed N/A

13. Locate the Notification to Workers and explain what it contains. *(Everyone must read. Right and responsibility to report radiation safety concerns, cannot be fired, misuse of radioactive material is a felony)*

Completed N/A

14. Demonstrate a survey using the survey instrument in their laboratory (if applicable) (Module-2)

Completed N/A

Show them how to determine when the survey meter was calibrated.

Completed N/A

Show them how to use the calibration factor and why it is important.

Completed N/A

Are there quality control charts available for the survey meter(s)?

No Yes N/A

15. Discuss any exemptions that have been granted by the State.

Completed N/A

Your Social Security Number will be used ONLY for identification purposes to track radiation dosimetry, training and other records maintained by the Radiation Control Office. The records are confidential and may not be viewed by anyone except for yourself and RCO staff. Providing your Social Security Number is done so on a completely voluntary basis. If you do not wish to provide your Social Security Number for RCO purposes, you must obtain an alternative CSU Identification Number from Human Resources Services (x5793) or Admissions (x6909) in order to complete this module.

I acknowledge that Module-4 verification of training was completed on this date and the results were discussed with me,

PLEASE PRINT CLEARLY

Last Name, First Name, Middle Initial:

Student I.D or Last 4 digits of your Social Security Number.: _____

Signature of User: _____

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Last Name, First Name, Middle Initial:

Student I.D or Last 4 digits of your Social Security Number.: _____

Signature of User: _____

Principal User:

Date: _____

Signature of RCO Personnel Conducting Interview:

RF-44B MODULE 4 "IN LAB VERIFICATION" TRAINING OUTLINE

PERFORMANCE BASED VERIFICATION OF TRAINING

Module Course Number (Date): _____

For Sealed Source Users Not Defined as an Irradiator that give rise to High Radiation Areas

1. Are the leak test records complete and in order? (*RCO once every 6 months, Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

2. Has the individual been instructed on possible hazards, significance of safety devices and operating procedures for the source being used? Is this training documented? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

3. Are there step by step operating procedures available? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2) N/A

4. Does the source have adequate security? (*Required Module-7*)
 Needs Training(0) Needs Refresher(1) Satisfactory(2)

5. Discuss specific devices that will give warnings of unusual occurrences or malfunctions that may cause exposure to radiation. What is the response to the warnings? (*Module 7, operator training, discontinue use of irradiator, Call P.U.*)
 Completed N/A

6. Discuss the estimated dose that they may expect from doing the procedures they perform. (*Located in the project – find info with operator*)
 Completed N/A

7. Discuss the radionuclides in use, the type of radiation emitted and the type of instrument needed to detect the radionuclides. (*Beta, Gamma, half-life, Geiger counter, NaI detector*)
 Completed N/A

8. Give an example of an emergency and a non-emergency situation and discuss procedures. (*RCO considers anything operator considers as an emergency, Chirpie malfunction – non emergency, source stuck in on position - Emergency*)
 Completed N/A

9. Review committed effective dose limits. (5 rem – whole body; 50 rem – extremities/organ or tissue; 15 rem – lens of the eye; 0.5 rem declared pregnant workers/occupational minors, 0.1 rem – general member of the public; Natural background in CO 0.45 rem)

Completed N/A

10. Inform females of the state rules for pregnant workers. (Voluntary to declare pregnancy. Must do so in writing to P.U. & RCO, RI-03 located in Yellow BK and on website. Monthly badge to be worn on stomach. No more than 50 mrem per month RCO ALARA limit.)

Completed N/A

11. Locate the ALARA statement and discuss the items.

Completed N/A

12. Verify that the individual(s) are badged, if required, and wearing the badge correctly. (Wear between neck and waist closest to the source of radiation)

Completed N/A

13. Locate the Notification to Workers and explain what it contains. (Everyone must read. Right and responsibility to report radiation safety concerns, cannot be fired, misuse of radioactive material is a felony)

Completed N/A

14. Demonstrate a survey using the survey instrument in their laboratory (if applicable) (Module-2)

Completed N/A

Show them how to determine when the survey meter was calibrated.

Completed N/A

Show them how to use the calibration factor and why it is important.

Completed N/A

Are there quality control charts available for the survey meter(s)?

No Yes N/A

15. Discuss any exemptions that have been granted by the State.

Completed N/A

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I acknowledge that Module-4 verification of training was completed on this date and the results were discussed with me,

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Signature of User: _____

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Student I.D or Last 4 digits of your Social Security Number.: _____

Signature of User: _____

Principal User:

Date: _____

Signature of RCO Personnel Conducting Interview:

RF-44D VISITOR RULES

Visitors Must Make an Appointment to Enter the Facility

Visitors Will Not Be Allowed In Unless Authorized by the Principal User and After a Pre-Evolution Briefing by the Principal User or Authorized Representative

Read and Obey General Rules

The Required Personal Protective Equipment (PPE) Must Be Worn

Visitors Are NOT ALLOWED TO HANDLE or USE Any Radioactive Material or Ionizing Radiation Producing Machine at Any Time

Visitors Will Be Required to Leave the Facility for Any Rule Violation

VISITORS must be escorted while at the facility

Immediately report ANY accident and/or injury to the Radiation Safety Officer

Understand ALARA philosophy and rules

Professional conduct is ALWAYS required

RF-44E Visitors Log

Department: _____ Principal User: _____

NAME (Last, First, MI): _____ DOB: _____

ID#: _____ M F Phone #: _____

Start Date / End Date (Day - Month - Year): _____

Representing: _____

Purpose of Visit: _____

Dosimeter Serial#: _____ Initial Reading: _____

Final Reading: _____ Initial – Final: _____

Accompanying CSU Representative: _____

1. I have had a pre evolution briefing.
2. I understand the personnel protective equipment (PPE) required to enter the facility.
3. I have read the visitors rules and understand them.
4. If I have been issued a dosimeter, I have been shown how and where the dosimeter will be worn and that I am not to tamper with the dosimeter in any way.
5. I have been informed of the regulatory dose limits.
6. I understand the exposure implications in the facility.
7. I agree to follow all instructions by the Principal or Authorized user overseeing the procedure I am observing.
8. I have read and understand the ALARA principles.

Signature: _____

VISITORS will be required to leave for any rule violation