## Revision History

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<th>Revision Date</th>
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<th>Description of Change</th>
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<td>00</td>
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<td>Juliette Jones</td>
<td>Initial creation and implementation.</td>
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Introduction
Florida Tech is committed to providing a safe and healthful environment for all employees, students, and visitors.

Florida Tech is licensed by the State of Florida, Department of Health, Bureau of Radiation Control as an authorized user of radioactive materials and radiation generating devices. The primary responsibilities of Florida Tech’s Radiation Safety Program are to ensure radiation controls are implemented to protect all university personnel and the public and to guarantee radiation sources are used in accordance with Chapter 64E-5 of the Florida Administrative Code (FAC).

Florida Tech shall use, to the extent possible, administrative and engineering controls based upon sound radiation protection principles in maintaining occupational doses and public doses as low as reasonably achievable. Florida Tech’s Radiation Safety Program is consistent with the rules and regulations set forth by the U.S. Nuclear Regulatory Commission (NRC) and the Florida Department of Health, Bureau of Radiation Control. To minimize exposure risks, the radiation safety practices outlined in this program must be maintained and adhered to by individuals using radioactive materials at Florida Tech.

Radiation Safety Program
This Radiation Safety Program sets forth polices, regulations and procedures approved by Florida Tech’s Radiation Safety Committee (RSC). The Radiation Safety Program is made up of procedures and guidelines which govern all segments of isotope use on campus. The following radiation control procedures are included as part of this program.

1. ALARA Policy,
2. Administration and Authorization,
3. Radiation Safety Training,
4. Operating Procedures,
5. Procedures for Receiving, Opening Packages of Radioactive Material,
6. Instructions for Obtaining Swipe Samples,
7. Instructions for the Preparation of Radioactive Waste for Disposal,
8. Leak Testing and Inventory of Radioactive Materials,
9. Emergency Procedures, and

Radiation Safety Program Controls
Florida Tech’s Radiation Safety Program has been established to protect the health and safety of users and the public. Florida Tech’s radiation safety staff, which includes the Radiation Safety Officer (RSO) and the RSC, are empowered to assure that these controls are adhered to.
1. Florida Tech’s Radiation Safety Program will be accessible to all users. Radiation safety procedures will be maintained by the RSO. In the event changes are made to this Radiation Safety Program, the RSO shall discuss compliance with the RSC, PIs, and Authorized Users.

2. The use of radioactive material at Florida Tech is governed by rules and regulations set forth in Chapter 64E-5, FAC and provisions set forth in the specific radioactive material license issued to Florida Tech by the State of Florida, Department of Health, Bureau of Radiation Control.

3. The Florida Tech RSO/RSC shall, at intervals not to exceed 12 months, review the Radiation Safety Program content and implementation.

4. The following items are established and maintained to ensure that the Radiation Safety Program mission is accomplished.
   a. ALARA Program,
   b. Radiation Safety Committee,
   c. Radiation Safety Officer,
   d. Principle Investigators
   e. Authorized Users;
   f. Monitoring/survey of radioactive material labs,
   g. Safe practices for using radioactive materials,
   h. Safe practices for labeling and storing radioactive materials,
   i. Identifying all areas which contain radiation producing devices, and

ALARA Policy

The ALARA Philosophy

Part III of Chapter 64E-5, Florida Administrative Code (FAC), establishes standards for protection against radiation hazards. Section 64E-5.303, FAC requires licensees to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational and public doses that are As Low As Reasonably Achievable (ALARA). Management, the Radiation Safety Officer

The primary concept of the ALARA philosophy is that unnecessary exposure to radiation should be avoided, even though current occupational exposure limits provide a very low risk of injury. The objective is to reduce occupational exposures (both individual and collective) as far below regulatory limits as is reasonably achievable by means of good radiation protection planning and practice.

Management Commitment

We, the management of Florida Tech, are committed to the ALARA philosophy of maintaining occupational and public radiation doses as low as reasonably achievable.
1. It will be a management priority that all personnel working with radioactive material be made aware of our commitment to the ALARA philosophy and that they be instructed in the procedures to be used to keep their exposures as low as possible.

2. Management has delegated authority to our RSO to ensure adherence to ALARA principles. Management will support the RSO in instances where this authority must be asserted.

3. Management will make all reasonable modifications to procedures, equipment and facilities to reduce exposures, unless the cost is unjustified. We will be prepared to describe the reasons for not implementing modifications that have been recommended.

Radiation Safety Officer Commitment

1. The RSO will emphasize the ALARA philosophy to all personnel working with radioactive material and will instruct workers to review current procedures and propose changes to reduce exposure levels.

2. If personnel monitoring is conducted, the RSO will review dosimetry reports for all monitored personnel upon receipt (monthly for film badges or quarterly for TLDs) to determine if unnecessary exposures are being received. The RSO will sign and date each report reviewed. The RSO will investigate within 30 days the cause of any personnel exposure considered to be excessive. If warranted, the RSO will take corrective actions to ensure that unnecessary exposures are halted, and recurrence is prevented. A report of each investigation and the actions taken, if any, will be recorded and maintained for inspection purposes by the RSO at the office of EHS.

3. At least annually, the RSO will conduct a formal review of the radiation protection program’s content and implementation, as required by subsection 64E-5.303(3), FAC. The review will include an evaluation of equipment, procedures, inspection findings, and any incidents. The RSO will assess trends in occupational exposures as an index of the program’s success and to determine if any modifications to the program are needed. A summary of the results of each annual review, including a description of actions proposed and taken, if any, will be documented by the RSO, discussed with management, and signed and dated by both. A report on each audit will be maintained on file for 3 years from the date of review, in accordance with section 64E-5.335, FAC.

Worker Commitment

All personnel working with sources of radiation will adhere strictly to policies and procedures applicable to activities involving radiation sources and will apply ALARA principles and good work practices to minimize their occupational exposures. Time, distance and shielding will be used to keep exposures ALARA. When working with sources of radiation, minimize the time spent near the source, maximize the distance from the source and make use of available radiation shielding. Workers must report to the RSO any conditions in the workplace that have the potential for causing unnecessary exposures.
Participants and Responsibilities

Radiation Safety Officer (RSO)
Responsibility for the overall Radiation Safety Program shall rest with the RSO. The duties and responsibilities of the RSO shall include, but are not limited to the following:

1. Acts as Florida Tech’s liaison officer with the Florida Department of Health on all radiation licensing matters.
2. Ensures that all terms and conditions of the license and regulations are complied with.
3. Administers the overall day-to-day radiation safety program, including but not limited to routine surveys and provision of dosimeter badges and dosimetry reports.
4. Maintains control over the procurement, use and disposal of licensed materials,
5. Furnishes guidance and direction to licensed material users on the safe operation and handling of radioactive materials and in the use of radiation survey instruments.
6. Develops and maintains current operation and emergency procedures.
7. Establishes and maintains an internal audit system that will ensure items not conforming to licensed conditions will be promptly identified and corrected.
8. Investigates the cause of any incident and determines necessary preventative measures,
9. Suspends any operation causing excessive radiation hazard as rapidly and safely as possible.
10. Maintains a list of all Principle Investigators (PI) and Authorized Users (AU).
11. Maintains an inventory of total radioactive materials and radiation producing machines at Florida Tech.
12. Establishes and maintains a radiation safety record keeping program.
13. Ensures that radioactive materials are properly secured against unauthorized access or removal.
14. Ensures that audits are performed at least annually to ensure that the Radiation Safety Program is being enacted as required.
15. Ensures that the license is amended whenever there are changes in licensed activities, responsible individuals and/or commitments provided in the licensing process.
17. Ensures that all users read and understand Florida Tech’s Radiation Safety Program.

Radiation Safety Committee (RSC)
The RSC is responsible for the review and oversight of the overall Radiation Safety Program. The RSC will consist of five individuals, including the RSO, that are Authorized Users at Florida Tech.

The duties and responsibilities of the RSC shall include, but are not limited to the following:
1. Responsible for reviewing and implementing the Radiation Safety Program and ensuring that all radiation safety activities are performed in accordance with approved procedures and regulatory requirements.
2. Seeks ways to reduce the occupational radiation exposure dose of licensed user.
3. Prescribes special conditions and requirements which may be necessary to ensure radiation safety.
4. Prepares and disseminates information on radiological safety for the use and guidance of students and staff.
5. Reviews and approves all activities involving the use of radioactive materials, and
6. Reviews all ongoing projects involving the use of licensed materials at timely intervals (at least annually).

Principle Investigator (PI)
The PI also shares the responsibility for the safe use of radioactive materials and radiation producing devices, specifically:

1. Administer and enforce safety rules and regulations as stated in the Radiation Control Guide which are necessary to the Radiation Protection Program in all areas within the scope of their authority.
2. Inform all employees of potential health hazards and the necessary safeguards which are established to guard against them.
3. Ensure that all employees working with or near radioactive materials or radiation producing devices are properly trained and monitored.
4. Ensure that dosimetry is appropriately used and that dosimeters are returned on time.
5. Inform the Radiation Safety Office of all changes in personnel working with radioactive materials or radiation producing devices and changes in facilities or use/storage locations. Maintain inventory records.
6. Maintain control over radioactive material and maintain adequate inventory and utilization records. Perform weekly contamination surveys when radionuclides are in use.
7. Ensure that all radioactive waste is received by EH&S Hazardous Material Management for ultimate disposal.
8. Ensure safe and secure storage of all radioactive materials and maintain proper signage on all labs and storage locations of radioactive material (contact the RSO for signage).

Authorized Users
These individuals work under the supervision of the PI (including the PI themselves). It is the responsibility of each person working with licensed materials to follow all radiation safety procedures without deviation, for their protection and the protection of others.
Radiation Training

At Florida Tech, all authorized users and PIs should have initial and annual refresher training. Visit the Florida Tech EHS website for details.

Authorized users should also have training specific to their lab protocols. That might include coursework related to specific procedures as well as training through their PI. This training will be assessed by the RSO through the Ionizing Radiation User Approval Request (RUAR) Form (See Appendix 1).

Annual refresher training will be done as part of the annual audit by the RSO or online through the Florida Tech EHS website: all PIs and authorized users must complete one of these trainings.

Only the RSO (or their EHS designee) can receive, survey, and deliver packages containing radioactive materials. Thus, the shipping and receiving department will receive specialized annual training on the procedure for a campus shipment of radioactive materials. Please see the section on “Purchasing and Receiving Radioactive Materials” for further information.

Sealed source only PIs and authorized users have their own specialized initial and annual training available. The RSO will provide this training during one of the biannual inventories of sealed sources or upon request.

Training records must be retained for the lifetime of the university or the termination of the license with the RSO in the office of EHS: a copy of training records must be in the position of the PI for the duration of their usage of radiation materials at Florida Tech. Safety Training falls under ES-1004 Safety Training Policy.

Authorization to Use Radioactive Materials

A PI must submit the Radioactive Material Use Authorization (RMUA) form (see Appendix 2) for each project requiring the use of radioactive materials. This includes detailed protocols (either in line 2.3 or attached to the form) and a list of graduate students, technicians, and research associates involved in the project as users and working auspice of the PI with isotopes. An IRUAR form must be filled out for each of these individuals before they are authorized to use radioactive materials. This should include their training (the online EHS training and/or coursework at Florida Tech/other institutions involving radiation safety/handling radioactive materials).

The forms should be sent to the RSO. The RSO will assess the lab to ensure radioactive materials controls are in place (i.e. segregated work areas, secured storage areas, spill trays for active work, PPE, waste containers, and shielding) and provide a copy of the Florida Tech Radioactive Materials Use and Safety Manual. If the required controls are in place in the laboratory, the RSO will present the forms to the RSC who will have final say on whether the authorization is approved or rejected.
Purchasing and Receiving Radioactive Materials

All purchases of radioactive materials must be approved by the RSO. The RSO must also be notified about transfers of radioactive materials from outside institutions. Only authorized users may work with radioactive materials, and only authorized Principle Investigators may purchase radioactive materials.

Shipping and receiving will notify the RSO whenever radioactive materials are sent to the University. The RSO (or a designated EHS specialist when the RSO is out of the office) will survey the package before delivery to the purchaser for contamination and to check that external radiation levels are below safe transport levels. The RSO (or designee) will deliver the radioactive materials to the lab storage location.

Storage of Radioactive Materials

Radioactive material can only be stored and used in designated locations. They should be stored in radiation areas whenever possible. Storage in public access locations should be locked/secured so that only authorized users, the PI, and the RSO have access, and the external exposure limits are below 0.2 mR/hr at 1 cm. Storage and use locations must be posted. See the posting section for links to signage.

Postings

The required signage on doors and entrances to storage areas include the NRC 3 Form, the Florida Department of Health Notice to Employees, the Emergency Notice with 24-hour emergency contact information, and a sign bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIALS” (See Appendix 3 for example). The RSO may also be contacted for signage.

Personnel Exposure Monitoring

Personnel Exposure Monitoring is provided at Florida Tech. Personnel Monitoring Devices (PEMs) are film badges that are worn monthly, and reports on exposures returned quarterly. Most radioactive materials used at Florida Tech are very small quantities or at low energy levels and do not require the use of PEMs. PEMs at Florida Tech are required for the handling of high energy beta (200 eV or greater such as Phosphorus-32) or gamma-emitting isotopes and as area monitors for radiation producing machines. Low energy beta emitters (such as tritium and Carbon-14) and alpha emitting radioisotopes do not require PEMs.

Under special circumstances, PEMs may be required/optional. These include PEMs for visitors, minors, and declared pregnant workers. Contact the RSO before allowing any visitors to Radiation Areas: the RSO can provide a visitor badge to monitor possible exposures.
The following are exposure limits. Any exposures that are 10% or greater of the exposure limits require follow-up with the RSO to investigate the exposures as well as methods to reduce exposures in the future.

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<td>Lens Dose</td>
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<td>Shallow Dose</td>
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Anyone who handles 1 mCi or more of tritium (Hydrogen-3) in their protocols is required to participate in Florida Tech’s Bioassay program. The bioassay process for Tritium involves a baseline, monthly, and final (one month after the final protocol) urinalysis by liquid scintillation count for individuals directly involved in the protocol. PIs are responsible for their Authorized Users’ participation in the Bioassay program (as required), and the RSO is responsible for performing the bioassay and updating/maintaining exposure records with bioassay results.

**Declared Pregnancy and Minors**

A worker in a radiation area may request a gestational PEM and declare a pregnancy. Declaring a pregnancy decreases the occupational exposure limit for the gestational period to 500 mrem. Contact the RSO if you wish to wear a gestational PEM and/or declare a pregnancy. Gestational PEMs should be worn at waist level.

No one under the age of 18 shall use radioactive materials. Under certain circumstances, a minor may be a visitor to a lab that stores radioactive materials. They are allowed in the lab provided they are wearing a visitor PEM (occupational limits for minors are 10% that of adults), are chaperoned by an authorized user, and are not allowed to directly handle radioactive materials. Contact the RSO before a minor is expected to visit a radiation lab.

**Use of Radioactive Materials**

All labs that use radioactive materials should have a copy of Florida Tech’s “Radioactive Materials: Use and Safety Manual.” The RSO will provide a copy to all approved PIs and their laboratories during the authorization process. Specific usage instructions are provided by the PI during usage training. The following is a best practice for general usage of radioactive materials.

The best way to minimize radioactive exposures is time, distance, and shielding. To minimize the time spent on a procedure, conduct “dry runs” of the protocol without the use of radioactive materials to become practiced in the procedure and have all the material you need in the experiment ready before you start it. Do not take radioactive materials out of their storage until they are needed and maintain distances that are as far as possible during use.
When there is a risk for external exposure, perform procedures behind shielding as much as possible. The type of shielding to use depends on the material.

Generally, alpha emitters and low energy beta emitters do not require shielding, but they pose a risk from internal exposure (i.e. injection, inhalation, or ingestion). General safety principles, including the prohibition of eating, drinking, smoking, mouth pipetting, applying cosmetics, and storing food or beverage containers in radioactive materials labs minimizes the risk of internal exposure. Personal protective equipment such as lab coats, safety glasses, and disposable gloves shall be worn whenever working with radioactive materials to decrease the risk of contamination.

High energy beta and gamma emitters may require shielding depending on the activity of the isotope. Lucite and Plexiglass are the best shielding for high energy betas. Lead shielding should be used for gamma emitters; however, it should never be the primary shielding for high energy beta emitters. Beta particle interaction with lead can cause a type of x-ray radiation called bremsstrahlung. To use lead shielding in conjunction with Lucite or Plexiglass shielding, make sure the lead lines the outside of the plastic shielding and not the inside.

Whenever possible, conduct all protocols on break resistant impervious trays or containers lined with disposable absorbent coverings. Volatile radioactive materials require special ventilation and filtration and should only be conducted in approved labeled hoods. Contact the RSO before running a protocol with a potentially volatile component.

All used radioactive material is considered radioactive waste, and special precautions must be taken with contaminated or radioactive items. Have a radioactive storage waste plan before conducting radioactive material procedures.

Do not wear PPE outside of a lab: always remove PPE in the lab to prevent spreading contamination and throw contaminated items into radioactive waste containers. Post-protocol surveys should be conducted before leaving a lab. Always wash hands after protocols.

After hours work and solitary work with radioactive materials is strongly discouraged.

**Survey and Laboratory Monitoring**

Authorized radioactive materials labs must have a method to survey labs for possible contamination. The type of survey conducted depends on the isotopic emission. High energy beta and gamma emissions can be surveyed with portable probes such as Geiger Mueller meters. Scintillation counting and wipe tests must be performed on alpha or low energy beta emitters as these emissions cannot be detected by Geiger meter probes. Always where PPE (safety glasses, disposable gloves, and lab coats) when conducting surveys.

When conducting a wipe test, use a filter paper to wipe 100 cm$^2$ of the surface. Place the filter in a vial with scintillation cocktail (biosafe brands only) and run the scintillation counter.
Contamination levels must not be equal to or exceed 100 dpm/100 cm². Contact the RSO if action levels are exceeded.

Geiger meter survey should be conducted such that the probe is directly above the surface being surveyed. To prevent contamination of the probe, cover it with a glove or fine plastic film. Check hands and feet for contamination with the probe after every protocol. Survey levels must not exceed 0.2 mR/hr. Contact the RSO if action levels are exceeded.

Surveys should be conducted at the end of the day whenever radioactive materials are used, weekly in labs where materials are used, and monthly where materials are stored. Also, authorized users of high energy beta and gamma emitters should do a self-survey of hands and feet with a Geiger meter to check for contamination after each use. Maintain copies of all surveys conducted, including maps of where surveys were taken, scintillation counts, Geiger readings, the date of the survey, and the initials of the person conducting the survey. Keep a copy for your records and scan and send a copy to the RSO for their records. Survey records must be maintained for three years.

Geiger meters must be calibrated annually to be of use in the laboratory. The RSO returns Geiger meters to Ludlum in March. The RSO will provide a loaner to use during calibration.

Decontamination Procedures
Survey results above action levels require decontamination. Whether it is a minor spill or a major spill, the RSO should be contacted immediately to assist in the clean-up (contact information is posted on every lab). If contamination is found, prevent others from entering the area, but do not leave the area and keep anyone around the contamination from leaving unless an emergency requires immediate evacuation. Staying put minimizes the spread of contamination.

There are two types of contamination: fixed and removable. Fixed contamination cannot be removed, and the item must either be shielded for decay or disposed of as waste. Removable contamination is determined by a smear test and can be decontaminated.

**Minor spills** are those with contamination levels below 1000 dpm/100 cm², less than 2 mR/hr at 5 cm, or less than 2 L. Survey personnel first to determine if they or their clothing are contaminated: contaminated clothing should be collected in plastic bags for decay or disposal. Limit contamination with absorbent materials and coverings and remove any contaminated items into bags for waste disposal. The RSO will assist in cleaning up the spill.

**Major spills** are those with contamination levels above 1000 dpm/100 cm², greater than 2 mR/hr at 5 cm, or greater than 2 L. Anyone not involved in the spill should be notified to leave the lab at once. Survey personnel first to determine if skin or clothing is contaminated. Bag all contaminated clothing and leave behind. Collect wash water if possible to minimize spread of contamination. Use absorbent material to contain the spill whenever possible. Switch off fans
and ventilation if possible and vacate the room. The room should not be reentered until assessed by the RSO. The RSO will assist in cleaning up the spill. Do not attempt clean-up without the RSO.

Whenever a person’s skin is contaminated with radioactive materials, they must immediately wash with soap and water for at least five minutes. Contact the RSO anytime an individual may have inhaled, ingested, or come into physical contact with radioactive materials.

Radioactive Waste Procedures

All radioactive waste is to be collected in plastic-lined primary containers (for solid waste), polyethylene bottles (liquid waste), vial boxes (for scintillation waste), or by steel shipping drums (also for solid waste).

Radioactive waste containers should be separated by isotope whenever possible: at the very least they should be separated into short half-life (less than 90 days) or long half-life containers. Mixing isotopes and short half-life with long half-life isotopes is very costly. Waste should also be separated by form which includes solid waste (contaminated solid materials, gels, paper, animal carcasses, plant tissue, etc.), liquid waste (including rinse-water and water miscible radio-chemicals) and scintillation waste (which includes cocktail and the vial).

The following radioactive material may be disposed of regardless of radioactivity per 64E-5.331 (F.A.C.):

1) 0.05 microcurie (1.850 kBq) or less of tritium 3 or carbon 14 per gram of medium used for liquid scintillation counting, and
2) 0.05 microcurie (1.850 kBq) or less of hydrogen 3 or carbon 14 per gram of animal tissue averaged over the weight of the entire animal tissue averaged over the weight of the entire animal; provided, however, tissue may not be disposed of under this section in the manner that would permit its use either as food for humans or as animal feed.  

Note: Biohazardous waste such as animal tissue is still hazardous waste: submit hazardous waste requests to EHS for all Biohazardous waste.

Detailed records for all radioactive waste must be recorded and sent to the RSO before requesting the waste to be picked up: disposal records must be kept for the lifetime of the license with the RSO in the office of EHS.

All radioactive waste is picked up by the RSO. All waste containers must be properly labeled with either a tag or sticker with the radiation trefoil and the caution wording “Radioactive Waste.” The label must also include the isotope, date, estimated activity on date, and the PI’s name. Contact the RSO if you need assistance with labeling.
It is strongly discouraged to mix hazardous waste with radioactive waste as this increases the cost of disposal. If it impossible to avoid mixed wastes, also include a hazardous waste label with the chemical contents listed.

Radioactive wastes are disposed by decay, sewer disposal, or sent to a commercial site by the RSO. Short lived wastes can be stored until decayed to acceptable levels (at least 10 half-lives). They will be surveyed before disposal to verify it is decayed and then disposed of by the RSO as conventional waste. Radiation labels/signage should be removed or defaced before disposal. Sewer disposed radioactive material must be readily soluble or dispersible in water and meet the requirements of 64E-5.330, State of Florida Bureau of Radiation Control ALIs, DACs, and Effluent Concentrations, Table III. Items that cannot be decayed or sewer disposed will be packaged for shipment to a commercial disposal site.

Sealed Sources
Sealed sources are used at Florida Tech for instrumental calibration, laboratory experiments, and/or gas chromatography detectors (ECD). Because they are encapsulated, the risk of internal exposure is minimized; general safety cautions should still be followed, and the capsule of a sealed source should never be intentionally broken.

Sealed sources should be in a locked box when not in use, and their use should be logged in a log that is easily accessible and adjacent to the lock box. All Authorized Users must record their use of the sealed sources in the log book (including name, date used, isotope, and activity).

All sealed sources will be inventoryed biannually by the RSO. Leak tests must be conducted every six months unless the sealed source contains an isotope with a half-life less than 30 days, contains only a gas, is 100 µCi or less of a beta or gamma emitting material, is 10 µCi or less of an alpha-emitting material, or the source is listed as storage only.

Out of service sources will be maintained in storage at the Radiation Safety Storage location. Sources may not be put back into service without approval of the RSO and the subsequent amendment of the license to allow such use.

Radiation Producing Equipment
Radiation producing equipment at Florida Tech include X-ray diffractors (XRDs) and electron microscopes. All radiation producing equipment must be registered with the Florida Department of Health. Contact the RSO prior to purchasing radiation producing devices. All registrations are required to be renewed annually with the Florida Department of Health; they are due in October. New registrations and renewals are completed by the RSO. If equipment is damaged, not functioning currently, or to be discarded, contact the RSO.
Emergency Procedures
Whenever there is direct threat to life or a potential for serious injury, always call 911 before contacting the RSO. Whenever emergency services are contacted, they should be informed of the radioactive materials they may possibly encounter during their response.

All radioactive labs must be posted with the Emergency Notice with 24-hour emergency contact information (which includes how to contact the RSO and Security). Contact the RSO whenever there are spills or possible external or internal exposures. It is strongly discouraged to conduct radioactive material protocols alone or after hours, during holidays, or over the weekends. Whenever there is a plan to conduct after hours protocols, always let the RSO know well in advance.

Record Keeping
Surveys, use logs, and waste logs must be kept for three years by both the PI and the RSO (all PIs must send copies of their records to the RSO as soon as completed). Records of exposure, purchases, training, and disposals must be kept by the PI for the duration of their radioactive materials use at Florida Tech and by the RSO for the duration of the license.

Audits and Inventory
The RSO will conduct audits annually to evaluate the records and procedures of a lab and to conduct annual refresher training. Inventories of radioactive materials will be taken during these audits as well. The audit is to ensure compliance with regulations and to address any concerns the PI and authorized user may have. A PI or authorized user may contact the RSO for assistance outside of the provision of the audits.
Appendix 1 - Radioactive Material User Approval Request

IONIZING RADIATION USER APPROVAL REQUEST

Name_________________________________________ Department___________________________

Bldg/Location__________________________________ Tel. #___________________________________

TRAINING (Use Supplemental Sheets if Necessary)

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<td>1. Principles and practices of radiation protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Radioactivity measurements, standardization and monitoring techniques and instruments.</td>
<td></td>
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<tr>
<td>3. Biological effects of radiation</td>
<td></td>
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</tbody>
</table>

I certify that I have read and understand the following:

1. Florida Tech Radioisotope Use Manual       Yes   No
2. Florida DOH – Control of Radiation Hazard Regulations Yes   No
3. Local Procedures and Methods of Control   Yes   No

Name of User __________________________ Date_______________

Signature of User__________________________

Approved________________________________ Date_______________
(Radiation Safety Officer)
### Appendix 2 - Radioactive Material Use Authorization

**RADIOACTIVE MATERIAL USE AUTHORIZATION**  
*(Prepare in original and one copy)*

<table>
<thead>
<tr>
<th>Department</th>
<th>□ New Request</th>
<th>□ Modification</th>
<th>Date Prepared</th>
<th>Reference Number</th>
</tr>
</thead>
</table>

1. Title or Brief Description of Project:

2. Procedure Including Special Techniques and Safety Precautions (Information to be submitted on additional sheets in duplicate)  
   3. Completion Date

4. Radioactivity Requirements

   A. Element and Isotope
   B. Physical Forms

   C. Total Quantity Required
   D. Estimated Activity Per Experiment

5. Location of Use

   □ Main Campus (FIT)  □ Temporary Site (Specify)  
   Building  Room Number

6. Users (Submit Supplement Form for Each Individual)  
   7. Signature of Request Originator  
   Date

   Principle Investigator
   Title or Position  Extension

8. Signature of Department Head  
   Date

   Title or Position  Extension  □ Disapproved

   □ Approved, subject to conditions noted in Item 12

9. Signature – Radiation Safety Officer  
   Date  Chairman – Radiation Safety Committee  Date

   Title or Position  Extension

10. Radiation Safety Committee

11. Expiration Date

12. An approved “Radioactive Material Use Authorization” shall be subject to all applicable rules, regulations and the orders of the Florida Tech Radiation Safety Committee now or hereafter in effect and any conditions specified below

   a. **Standard Conditions**
      1. The Principle Investigator shall insure compliance with Florida Tech Radiation Safety Manual and statements and procedures contained within the request.
      2. The Principle Investigator shall provide health and safety procedures covering radiological protection, control and security of radioactive material, to each individual using or having responsibility for use of such material.

   b. **Special Conditions** (To be completed by Radiation Safety Committee)
Appendix 3 – Caution: Radioactive Materials Sign