

APPENDIX I

UNIVERSITY OF FLORIDA

Program for Maintaining Occupational Radiation Exposure for Non-Medical Licensed Activities at the University of Florida, As Low As Reasonably Achievable (ALARA)

I. Management Commitment

- A. The University of Florida is committed to the program described in this document for keeping radiation exposures (individual and collective) as low as reasonably achievable (ALARA). In accordance with this commitment, we hereby establish an administrative organization for radiation safety and will develop the necessary written policies, procedures, and instructions to foster the ALARA concept within our institution. The organization includes a Radiation Control Committee (RCC) and a Radiation Control Officer (RCO).
- B. The RCO will perform a review to determine methods by which exposures might be lowered. This review shall include reviews of operating procedures and past exposure records, inspections and consultations with the radiation control staff. A brief summary of the audit will be prepared covering the scope of the review and the conclusions reached, and lessons learned, if any.
- C. A representative of administration shall be an active member of the RCC. The University of Florida will consider any modifications or changes as recommended by the Committee including those resulting from the annual review of the radiation safety program performed by the RCO.
- D. Modifications to operating and maintenance procedures and to equipment and facilities will be made when they will reduce exposures at reasonable costs. We will be able to demonstrate that improvements have been sought, that modifications have been considered, and that they have been implemented where reasonably achievable. Where modifications have been considered but not implemented, we will be prepared to describe the reasons for not implementing them.
- E. In addition to maintaining doses to individuals as far below the limits as reasonably achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level.

II. Radiation Control Committee

- A. Review of Proposed Users and Uses
 - 1. The RCC will review the qualifications of each potential Principal Investigator (PI) and approved user of radioactive material and radiation producing devices with respect to the types and quantities of materials and uses for which he/she has applied to assure that the user will be able to take appropriate measures to maintain exposure ALARA.

2. When considering a new use of radioactive material, the RCC will review the efforts of the PI to maintain exposure ALARA. The user shall have systematic procedures to ensure ALARA and must consider the use of special radiation safety equipment, such as rubber or disposable gloves, fume hoods, remote handling tools, and appropriate shielding in his/her proposed use, when appropriate.

B. Delegation of Authority

1. The RCC will delegate authority to the RCO for enforcement of the ALARA policy.
2. The RCC will support the RCO in those instances where it is necessary for the RCO to assert his authority. Where the RCO has been overruled by the RCC, the RCC will record the basis for its action.

C. Review of the ALARA Program

1. In association with the RCO, the RCC will perform an annual review of all current radiation safety procedures and the development of new procedures as appropriate to implement the ALARA concept.
2. The RCC will review all instances of deviations from the ALARA philosophy. Information in support of the review will be supplied by the RCO.
3. The RCC will evaluate the institution's overall effort for maintaining exposures ALARA. This annual review will include the efforts of the RCO, approved users and workers as well as those of Administration.
4. The RCC will perform a periodic review of occupational radiation exposure with particular attention to instances in which the Investigational Levels in Section VI are exceeded. The principal purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when Investigational Levels are exceeded.

III. Radiation Control Officer (RCO)

A. Annual and Quarterly Review

1. The RCO will perform an annual review of the radiation control program for adherence to ALARA concepts. Reviews of specific procedures may be conducted on a more frequent basis.
2. The RCO will review, at least quarterly, the external radiation exposures of approved users and workers to determine that their exposures are ALARA in accordance with the provisions of Section VI of this program.

3. The RCO will review, at least quarterly, the records of radiation level surveys in unrestricted and restricted areas to determine that radiation levels were ALARA during the previous quarter.

B. Education Responsibilities for ALARA Program

1. The RCO will inform PIs, approved users, workers, and ancillary personnel of ALARA program efforts.
2. The RCO will ensure that PIs, approved users, workers and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that the administration, the RCC, and the RCO are committed to implementing the ALARA concept.

C. Cooperative Efforts for Development of ALARA Procedures

PIs, approved users, workers and ancillary personnel will be given opportunities to participate in formulation of the procedures that they will be required to follow.

1. The RCO will be in close contact with all users and workers in order to develop ALARA procedures for using radioactive materials and radiation producing devices.
2. The RCO will establish procedures for receiving and evaluating suggestions for improving ALARA procedures and will encourage the use of these procedures.

D. Reviewing Instances of Deviation from Good ALARA Practices

The RCO will investigate all known instances of deviation from good ALARA practices and will determine the causes. The RCO may require changes in working procedures to maintain exposures ALARA.

IV. Principal Investigators

A. New Procedures Involving Potential Radiation Exposures

1. The PI will consult with and receive the advance approval of the RCO during the planning stage before using radioactive material for a new procedure.
2. The PI will evaluate all procedures before using radioactive material to ensure that exposure will be kept ALARA. This may be implemented through the application of trial runs.

B. Responsibility of Principal Investigator to Persons Under His/Her Supervision

1. The PI will explain the ALARA concept and his/her commitment to maintain exposures ALARA to all persons under his/her supervision.

2. The PI will ensure that persons under his/her supervision who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

V. Persons Who Receive Occupational Radiation Exposure

- A. The worker will be instructed in the ALARA concept and its relationship to working procedures and work conditions.
- B. The worker will also be informed of recourses that are available if he/she feels that ALARA is not being promoted on the job.

VI. Establishment of Investigational Levels in Order to Monitor Individual Occupational External Radiation Exposures

The University hereby establishes Investigational Levels for occupational external radiation exposure which, when exceeded, will initiate review or investigation by the RCO with subsequent review by the RCC. The Investigational Levels are listed in the table below. These levels apply to the exposure of individual workers. In cases where it is necessary for a worker's or a group of workers' doses to exceed these Investigational Levels; the RCC retains the right to establish new Investigational Levels on the basis that is consistent with good ALARA practices for that individual or group. Justification for new Investigational Levels will be documented.

- A. The following actions will be taken at the Investigational Levels as stated in the table below.

- 1. Monthly exposure of individuals to less than Investigational Level I

Except when deemed appropriate by the RCO, no further action will be taken in those cases where an individual's exposure is less than values for the Investigational Level I.

- 2. Personnel exposures equal to or greater than Investigational Level I, but less than Investigational Level II.

The RCO will investigate the exposure of each individual whose monthly exposures equal or exceed Investigational Level I and will report the results of the investigation at the first RCC meeting following the quarter when the exposure was recorded. If the exposure does not equal or exceed Investigational Level II, no further action related specifically to the exposure is required unless deemed appropriate by the RCC. The RCC will, however, consider each such exposure in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the RCC minutes.

- C. Personnel exposures equal to or greater than Investigational Level II

The RCO will investigate in a timely manner the cause(s) of all personnel exposures equaling or exceeding Investigational Level II and, if warranted, will take action. A report of the investigation and actions taken, if any will be presented to the RCC at the first meeting following completion of the investigation. The details of these reports will be recorded in the meeting minutes. A report of the investigation will also be made available to the Department of Health, Bureau of Radiation Control.

**Investigation Levels
for Radiation Exposure**

		Level I mrem per month	Level II mrem per quarter
Research Laboratories,	TEDE	40	375
	DDE+CDE	400	3750
	LDE	125	1125
	SDE	400	3750
Veterinary Medicine Radiology	TEDE	300	1250
	DDE+CDE	3300	12500
	LDE	1000	3750
	SDE	3300	12500

TEDE = Total Effective Dose Equivalent = DDE + CEDE = deep dose equivalent and the committed effective dose equivalent

DDE+CDE = Sum of the deep dose equivalent (DDE) and the committed dose equivalent (CDE) to any organ or tissue other than the lens of the eye

LDE = Lens of the eye (eye dose equivalent)

SDE = Skin (shallow dose equivalent) or to any extremity

NOTE: Bimonthly Investigation Levels are 2x monthly Investigation Levels

When annual doses exceed the levels specified in 64E-5.304 (1) (a) and (b), a report of the investigation will also be made available to the Department of Health, Bureau of Radiation Control.

VII. Signature of Certifying Official

I hereby certify that this institution has implemented the ALARA program set forth above.

By: _____

Date: _____

Ed Poppell
Vice President of Finance and Administration
University of Florida