LOS ANGELES CITY COLLEGE
LACC
The City's College.

Radiologic Technology Department

2020 Radiation Safety Program

Policies and Procedures

Program Number 1014 & 1076

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Introduction

The Los Angeles City College provides one education program that use x-radiation sources and are registered under the facility number (FAC00016286).

LACC Radiologic Technology Radiation Safety Program (CDPH-RHB Facility # FAC00016286)

Philosophy - All students are expected to perform instructor-supervised (direct supervision) experiments using ionizing radiation.

Organization and Administration

A. The Radiation Safety Officer, Richard S. Sayer, EdD, RT(R) CRT LRT(R) sayerrs@lacitycollege.edu oversees the Radiation Safety Plan and maintains all proper documentation for state and federal compliance.

The alternate Radiation Safety Officers (Julie A. Washenik, R.T. (R), (M) washenja@lacitycollege.edu assist with the compliance process as well.

B. The Program Director works with the Radiation Safety Officer(s) to ensure required reporting to the CDPH-RHB is in compliance with CCR Title 17.

Radiation Safety Policy

OSHA and other safety guidelines are followed regarding radiation safety in the classroom and in the clinical setting. Personnel Whole Body Radiation Dosimeters for radiation monitoring are furnished for all radiology students. Dosimeters are to be worn at all times, and will be monitored on a monthly basis. The purpose is to inform students, faculty and administrators of procedures that must be followed to ensure radiation safety through the proper use and monitoring of radiation exposure.

a. Radiation Monitoring During Campus Laboratory **(Mandatory)**

- The following rules have been established for Students protection against ionizing radiation during Campus Laboratory Classes. These rules are mandatory and must be followed without exception.
- An Instadose USB Badge properly oriented and placed, must be worn at all times during exposure activities as they are part of Students uniform. If protective aprons are used, the Instadose USB badge must be worn outside the apron so that any radiation reaching any part of the body will be recorded.
- All students who have declared pregnancy must wear a fetal badge at all times during exposure activities.
- It is the student's responsibility to read the Instadose dosimeter badge by the 1st day of each new month. The student's standing in the program will be affected by failing to adhere to this

requirement. The Instadose dosimetry readings are available to students through the instadose website and each student has a log in to adhere to FERPA privacy rules.

- Any lost badge may result in a negative participation grade in Directed Clinical Practice. A $25 replacement fee to be paid in the form of a check made out to Mirion must be submitted before a student receives a new badge.
- During activation of the tube, students must not be in a direct line with either tube or phantom. Students must not observe the phantom during exposure from an adjacent room or hall unless through a protective window. Students must not "peek" around a door nor through a crack between door and wall.
- During an exposure, Students cannot place themselves in direct line with the central ray, even though they are wearing a lead apron…and even though a lead shield is interposed between the tube and the student. The tube must in all cases be pointing away from the student's body.
- Under no circumstances will students permit themselves or their fellow students (or any other human being) to serve as "patients" for test exposures or experimentation.
- All students must perform all simulation imaging procedures under the **direct supervision** of a qualified practitioner. The JRCERT defines direct supervision as student supervision by a qualified practitioner who: reviews the procedure in relation to the student's achievement; evaluates the condition of the patient in relation to the student's knowledge; is present during the conduct of the procedure; and reviews and approves the procedure and/or image.
- Repeat radiographic examinations: All radiologic technology students, regardless of the student's level of competency and in support of professional responsibility for provision of quality patient care and radiation protection, **Non-Diagnostic Radiographs Shall Be Repeated Only In The Presence Of a Qualified Radiographer.**
- Failure To Comply With This Policy Will Be Grounds For Disciplinary Action. Continued Abuse Will Result In Termination From The Program.

b. ALARA Program for All Student Exposure Limits

Annual Radiation Exposure Limits			
Whole Body (Annual) **Dose for Occupational Workers**		**5,000mrem/ year** **Stochastic Effects**	
Lens of the Eye		**15,000mrem/ year** **Non-Stochastic Effects**	
Extremities and Skin		**50,000mrem/ year** **Non-Stochastic Effects**	
Fetal Entire Gestation		**500mrem/ year**	
Fetal Monthly Dose Limit		**50mrem / year**	
General Population		**100mrem/ year**	
Dosimeter	**ALARA Level I**	**ALARA Level II**	**ALARA Level III**
Whole Body (Monthly)	**50mrem**	**150mrem**	**200mrem**
Whole Body (Quarterly)	**150mrem**	**400mrem**	**600mrem**
Extremity (Monthly)	**400mrem**	**450mrem**	**600mrem**
Extremity(Quarterly)	**1,000mrem**	**1,125mrem**	**1,500mrem**
Declared Pregnant Worker (Monthly)	**20mrem**	**40mrem**	**50mrem**

ALARA I	**Radiation Safety Officer Notified. Report Kept on File.**
ALARA II	**Badged Radiation Employee/ Student receives a Report of Unusual Radiation Exposure (RURE)**
ALARA III	**Badged Radiation Employee/ Student receives a Report of Unusual Radiation Exposure (RURE)**
	RSO performs a Review of a Worker Exposure Conditions and Procedures

- The ALARA concept imposes lower operational dose limits that are even more restrictive than the maximum Legal dose limits shown in Table I above.
- This ensures an enhanced safety factor foe what are already considered to be safe annual doses for radiation workers.
- **What are the ALARA Investigation Levels?**
  -There are two types of ALARA investigation levels for external occupational radiation exposure as indicated by a dosimeter. If a worker's dose for any calendar month (30 days), calendar quarter (3 months) or calendar year (12 months) exceeded these values, an investigation is conducted by the RSO to determine if there are reasonable ways to reduce the dose levels.

If a student exceeds the Level I exposure limit in a month the student will receive verbal advising by the Program Director and RSO.
If the student exceeds the Level II exposure limit in a month, the Radiation Safety Officer will meet with the student to determine the cause of the high exposure and counsel the student on how to reduce the exposure they are receiving. This will be documented in writing and placed in the student's file.

c. Excessive Radiation Exposure

1. The Radiation Safety Officer will monitor all dosimetry reports.
2. If a student's dosimeter reading exceeds the limit, the Radiation Safety officer will investigate the causes for the excessive exposure readings.
3. The investigation may include interviews with the student and clinical site and all relevant individuals.
4. All previous exposure readings for the student and clinical facility will be evaluated.
5. The investigation is to evaluate why the exposure readings are elevated.
6. A report of the information for interviews and all other sources will be shared for corrective action and placed in the students file.
7. The counseling form will be used to document the event and be placed in student file.
8. If corrective action of the student is not implemented, and dose readings do not reduce, student will be removed from the program.

d. Radiation Safety Procedures for the Declared Pregnant Student

The following radiation procedures must be followed:

i. Continue to wear your whole body dosimeter on the outside of your collar.

ii. Wear a second dosimeter, fetal badge, at the waist level.

iii. If wearing a lead apron, the fetal badge goes under the lead at the level of the waist.

iv. If there is not a wrap lead skirt, wear a lead shield and a half wrap apron wrapped around the back.

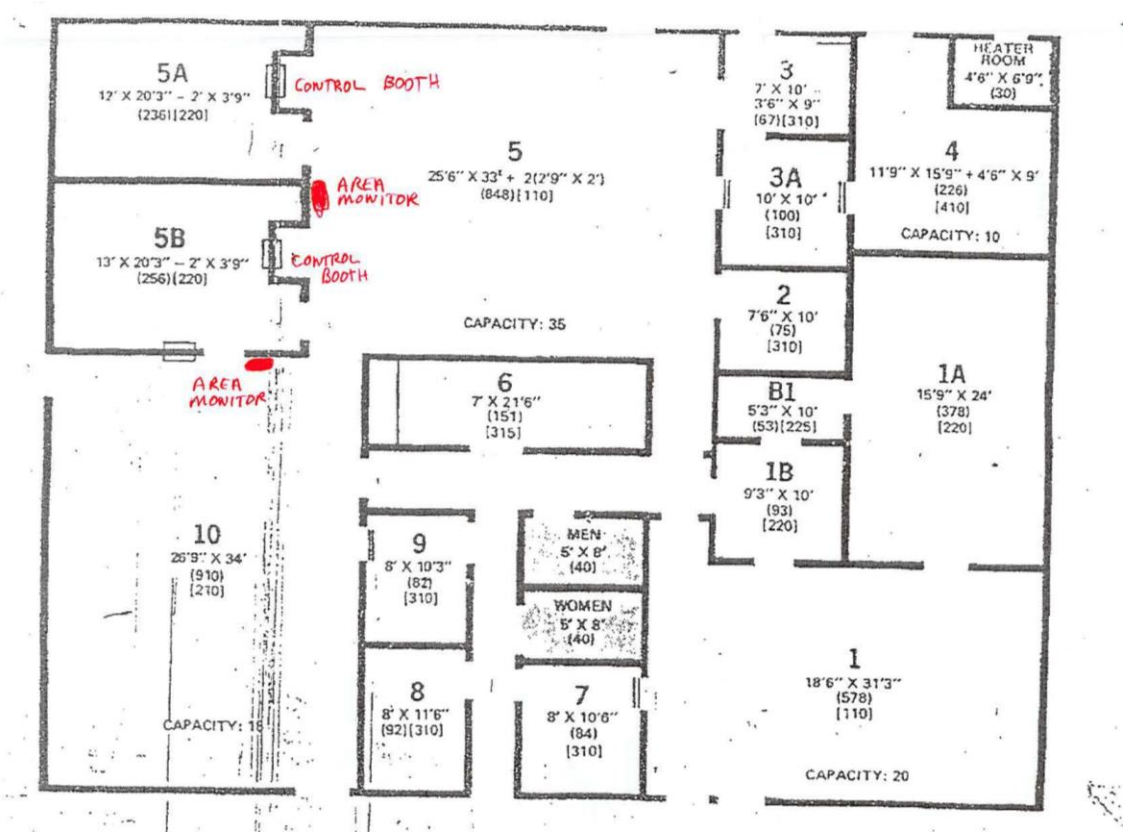
v. Keep maximum distance between yourself and the tube and the patient.

vi. Review the monthly fetal dosimeter exposure every month with the Radiation Safety Officer(s).

Floor Plan

Room Design: Rooms 5A and 5B are live x-ray rooms. The control booths are placed to where only twice scattered radiation could reach the operator. The doors leading into the x-ray room contain 1/16th lead shielding and have interlocks that prevent making an exposure if the door is not closed. The rooms have "Caution X-ray" warning signs on all doors as well as flashing light indicators above the doors when the equipment is energized. In addition, padlocks are inserted into the x-ray equipment circuit breakers so the equipment cannot be activated unless the lock is removed first by faculty member.

All equipment is periodically calibrated and may be verified during regular CDPH-RHB inspections. The primary barriers are 1/16th thick lead to protect the students in the classroom. All clinical training facilities are JCAHO approved and have regular inspections by the CDPH-RHB and their in-house radiation safety officer. Area monitors are placed in rooms 5 and 10 (See the RT floor plan below).



ALARA- As Low As Reasonably Achievable

a. Any unauthorized exposure or activation of equipment will result in the student's dismissal from the program.

b. Any individual experiment or project will be reviewed and authorized by the faculty member or clinical instructor first.

c. A student is required to exercise sound radiation protection practices at all times. At no time may a student participate in a procedure utilizing unsafe protection practices.

d. Students shall practice "as low as reasonably achievable" (ALARA) guidelines, with respect to themselves, peers, healthcare personnel and patients.

e. Students are not allowed to expose any human being or animal to the direct x- ray beam while in the school laboratory.
   i. Students engaged in practices must work under the direct supervision of a qualified practitioner.

f. Phantoms and positioning devices are provided for campus laboratory experiments, as necessary.

g. Students must remain behind the primary barrier for all exposures, except:

   i. When wearing protective lead apparel for directly supervised fluoroscopic laboratory experiments.

h. The student is required to wear a lead apron with their dosimetry device worn on the collar outside the apron for fluoroscopic experiments.

i. The program provides lead glasses, aprons, gloves, gonad shields and mobile shields for protective use.

Dosimetry Reports to Individuals

A. Occupational Workers

i. The programs utilizes Instadose (www.instadose.com) as a provider of dosimetry devices and analysis.

ii. Program students and faculty are provided with dosimetry monitoring.

iii. Each month the dosimetry results are reviewed by the Radiation Safety Officer and are available for students to review in their individual Instadose login.

iv. All dosimetry records are archived in the Radiation Safety Officer's office or the Clinical Coordinators Office. All dosimetry records are kept indefinitely, according to CA Code of Regulations (CCR), Title 17.

v. Students and instructors are provided dosimeter devices by the program and are mandated to wear them during energized laboratory experiments and clinical training hours, with their dosimetry device worn on the collar outside the apron.

vi. Each student and instructor is subject to the occupational exposure limits and the requirements for the determination of the doses which are declared in CCR, Title 17.

vii. Occupational dose limits for adults (18 years of age or older):

- Total effective dose of 5.0 rems (0.05 Sv) or effective dose of 15 rems (0.15 Sv) to the eye or 50 rems (0.5 Sv) to the skin or extremities.

viii. Occupational dose limits for minors (under 18 years of age):

- Total effective dose of 0.5 rems (0.05 Sv) or effective dose of 1.5 rems (0.15 Sv) to the eye or 5.0 rems (0.5 Sv) to the skin or extremities.

ix. Requests for copies of dosimetry records will be accommodated within 30 days by the Radiation Safety Officer(s).

b. Pregnant Workers

i. Definition of declared pregnant worker: A woman (female student) who has voluntarily informed her employer (or program director) in writing of her pregnancy and estimated due date.

ii. The student is not required to notify the program, nor will she be dismissed from the program, if she is pregnant.

iii. A student may withdraw their written declaration of pregnancy at any time.

iv. Any student who declares her pregnancy in writing to the Program Director and who desires to continue the program will be required to wear an additional fetal dosimetry device and continue active and direct participation in all laboratory experiments while practicing proper radiation safety. If she prefers to discontinue and defer to the next year's student cohort, she may do so. She may defer only once.

v. The student is encouraged to talk to the Program Director about any questions or concerns she may have.

DOSIMETRY PROGRAM

Students in the radiography program are instructed in the use of radiation monitoring and the detrimental effects of radiation on the body (RT 202, 240). The students are educated in the different types of patient and personnel protective devices as well (RT 202, 206, 207, 240, 280, 281, 282, 283, 103, 104).

Table. Types of individual monitoring device, area monitors and exchange frequency:

Types of Badges	*Radiation Detector Type*	*Exchange Frequency*
Personnel Monitor	Instadose™ dosimeter	N/A
Area Monitor Room 5	Instadose™ dosimeter	N/A
Area Monitor Room 10	Instadose™ dosimeter	N/A

Instructions to employees/students on the proper use of individual monitoring devices is found under Radiation Protection Program – Policies and Procedures. Student are instructed not to switch badges with other occupational workers, deliberately expose their badges to radiation except in the course of training or employment and understand the consequences of deceptive exposure of the radiation monitor.

Current instructions to students/employees about the use of badges include:

(a) Instadose Badges shall be worn at all times when radiographic exposures are being made
(b) Instadose Badges shall be read at the beginning of each month
(c) Any student making radiographic exposure while not wearing radiation badge or wearing someone else's badge will be sent home and a formal disciplinary hearing with the radiology department staff and Dean of Academic Affairs will be convened to determine the seriousness and consequences to the student. Using someone else's badge would be considered falsification of college records and would be grounds for dismissal from the college.
(d) Instadose Badges will be used at Los Angeles City College and at their clinical training sites.

The students are provided radiation monitoring badges from Los Angeles City College during the fall Semester in which they are enrolled. The student uses that radiation monitor while they are on campus for laboratory experiments and at their clinical training site for two days a week in the RT 260 class. Once the student begins their actual clinical training in RT 280, the hospital and their radiation safety officer will provide us with copies of the students' dosimetry reports. In addition, with Instadose badges we are able to monitor the exposure students receive on a monthly basis.

4. Procedures to ensure the combined TEDE doesn't exceed 5 Rem per year:

(a) Review of monthly dosimeter records for students on campus and at the clinical education training site.
(b) There are no procedures for minors because any person under the age of 18 is not permitted to enroll or participate in the Radiology program

Area Monitoring and Radiological Controls

A. Area Radiation Monitoring

i. The entrance to each x-ray room is marked with signage, “Caution: X- ray”.

ii. Conspicuously posted in the energized laboratory area are the following:

- Operating and emergency procedures applicable to radiation sources.
- A current copy of Department Form RH-2364 (Notice to Employees).
- Any notice of violation(s) or any order pursuant to the applicable regulations (immediately).
- Current copies of user licenses

iii. Proper signage is maintained by the Program Director and RSO’s.

iv. Instructions of how to access CCR Title 17 and incorporated sections of 10 CFR 20 are posted in the main display case when you enter the RT building.

B. Instrument Calibration and Maintenance

i. All experiments will be conducted on CDPH-RHB inspected x-ray machines, which are inspected annually using instruments and procedures compliant with CCR Title 17.

ii. The Los Angeles Community College District maintains service contracts for all x-ray machines and utilizes these contracts as necessary to correct any potential problems.

iii. Registration and physicist certification of all machines are available for review in the Program Director’s office.

iv. Operator manuals for each machine are available for review in the Program Director’s office.

v. The disposal of x-ray machines is made in compliance with CCR Title 17

B. Quality Assurance/Quality Control

i. The program maintains all records regarding performance evaluations, acceptance testing and radiation safety of all x-ray machines.

ii. The program maintains required QC testing equipment in proper working order, including records of calibration frequency and type.

iii. Records are kept at least three years.

Emergency Exposure Situations

a. A student is required to notify the Radiation Safety Officer in writing when a situation arises that the student knows may affect the quality of the radiation monitoring report.

i. Examples may be leaving it attached to a lead apron or lab coat which has been stored in a radiographic/fluoroscopic room, passing it through an airport security (radiation) system or wearing it during a medical procedure.

b. In the event that a student receives an excessive dosimetry reading, a consultation with the Program Director and Radiation Safety Officer is required.

i. An excessive dose will be considered by the program as one that appears out of usual range for a student or faculty member's usual practice, or exceeds regulatory limits.

ii. The Radiation Safety Officer will investigate to determine the reason (i.e.: student practices, equipment, or erroneous badge handling or reading). The student will be counseled regarding radiation safety practices and their employer (if applicable) notified.

iii. The student will be provided a written conference form for their record; a copy will also be kept by the program for five years as part of the student record.

iv. The CDPH-RHB will be notified (via telephone and in writing) of the event:

- Within 24 hours for any exposure that causes or is likely to cause a total effective dose of 5 rems (0.05 Sv) or effective dose of 15 rems (0.15 Sv) to the eye or 50 rems (0.5 Sv) to the skin or extremities.
- Immediately for any exposure that causes or is likely to cause a total effective dose of 25 rems (0.25 Sv) or effective dose of 75 rems (0.75 Sv) to the eye or 250 rems (2.5 Sv) to the skin or extremities.
- Reports will contain the caller's name and call-back telephone number, description of event with exact location, date and time, the quantities and physical form of the licensed material involved, manufacturer and model number of any equipment that failed or malfunctioned, any personnel radiation exposure data available and corrective actions taken or planned.

v. The CDPH-RHB address is P.O. Box 997414, MS 7610, Sacramento, CA 95899-7414. The telephone number is (916) 327-5106.

vi. If a student has been found to have willfully mishandled or influenced the reading of another student's film badge, the student may be dismissed from the program and/or reported to appropriate agencies.

Record Keeping and Reporting

a. It is the responsibility of everyone to promptly report to the Radiation Safety Officer and/or Program Director any condition which may lead to or cause a violation of department regulations, inspection provisions, or an unnecessary exposure to radiation.

i. The Program Director will notify the CDPH-RHB (via telephone and in writing) of the event within 24 hours, according to Title 17.

ii. Individuals may choose to report the situation or incident directly to the CDPH-RHB.

iii. The CDPH-RHB address is P.O. Box 997414, MS 7610, Sacramento, CA 95899-7414. The telephone number is (916) 327-5106.

Radiation Safety Training

a. Occupational Workers

i. The program provides training on each x-ray machine to each student and faculty. Documentation of this training is available in the RSO's office.

ii. No one is allowed to operate the energized lab on campus without having been trained on it and a trained radiology instructor is present.

iii. After having been training on a particular machine, if the operator has any doubt as to the function or performance of it, he or she should stop and consult a faculty or clinical instructor.

- The program provides education to each operator as to the health risks of radiation exposure, methods to comply with ALARA and related state and federal regulations.

Non-Occupational Workers

i. The Radiation Safety Officer shall work together with campus Facilities personnel to provide information and/or training for working around radiation equipment.

Internal Audit Procedures

a. The Radiation Safety Officer maintains an annual, formal assessment of dosimetry results and compliance and reports the data to the Program Director.

b. The Program Director maintains an annual, formal audit of all other aspects of the Radiation Protection Program pertinent to their programs. Items include:

i. Inspections and results
ii. QA/QC
iii. Training

c. Internal audit data is available to the CDPH-RHB, program advisory committees and the public, upon request and in compliance with FERPA.

Clinical Affiliates

1. Radiation Protection Programs (RPP's) are required for all licensees of radiation sources, including clinical affiliates (10 CFR 20, Section 20.1101). RPP's are required for each facility's annual machine registration with the CDPH-RHB.
2. The LACC RT Program is required to verify the current status of radiation machine registrations of each clinical affiliate when applying for a Clinical Affiliate Site (CAS) certificate and submit a copy of the current machine registration with application to the CDPH-RHB.
3. Students are provided a detailed orientation to the LACC RT Radiation Safety Program upon admission to the program.
4. Students are oriented to their clinical affiliate RPP through their clinical instructors.

Clinical Supervision of Students

1. Students training at clinical affiliates assist or perform radiologic examinations of a living human being or animal ordered by a licentiate under the direct supervision of a qualified, licensed practitioner until competencies have been achieved and under indirect supervision after competencies have been achieved.
2. Clinical Instructors have the overall responsibility of supervision compliance at their site and report student radiation safety issues to the Program Directors and their own department administrators.

Program Responsibilities

1. The program will provide a copy of the LACC RT Department Radiation Safety Policies to each student enrolled in the program.
2. The program will provide the most current and applicable state-approved curriculum to the student.
3. The program will provide the most current and applicable state-approved curriculum to the instructor and will facilitate academic and equipment resources as necessary and applicable.
4. Upon successful completion, the program will provide certification to the student to be used with their CDPH-RHB application for appropriate licensures.
5. The program will keep copies of student records for five years.
6. The program will provide notification to the CDPH-RHB of any changes in facility location or telephone number, course offerings, program director or faculty, clinical affiliation agreements, student status (dismissals, withdrawals and graduations) within 30 days, according to Title 17 of the CA Code of Regulations, using form CDPH 8697 or 8696, as appropriate.
7. The program will comply with all applicable laws of CDPH-RHB Title 17.

Instructor Responsibilities

1. The instructor will understand and enforce the policies and procedures contained in this manual.
2. The instructor will present the most current and applicable state-approved curriculum to the student.
3. The instructor will require the student to attend all state-mandated didactic and laboratory sessions. The instructor will provide makeup opportunities as the instructor deems fit, within the required and available parameters of the program.
4. The instructor will not give the student a passing grade if the student has not attended all the required hours and completed all of the required laboratory assignments, as outlined by the CDPH-RHB.
5. The instructor will provide student attendance and performance data to the Program Director who will then issue certification to the student, if appropriate.
6. The instructor will comply with all applicable laws of CDPH-RHB Title 17.
7. The instructor will attend training for all equipment utilized by the program.

Student Responsibilities

1. Students are not allowed to hold a patient.
2. Students must ensure a ratio of 1:1, meaning one student with one supervising technologist.
3. Once student obtains competency, student may have indirect supervision EXCEPT when working on portable exams, or fluoroscopy and Operating Room (OR) with C- arm, as they are to be directly supervised at all time.
4. Students who are working in fluoroscopy, whether in the fluoroscopy room or the OR, will only work with a state licensed technologist only.
5. Students must have a fluoroscopy licensed technologist directly supervising them when selecting technical factors, positioning the fluoroscopic unit or making any type of fluoroscopic exposures.

The student will understand and comply with the policies and procedures contained in this manual.

REGULATORY CONTACT INFORMATION

California Department of Public Health - Radiation Health Branch

P.O. Box 997414, MS 7610 Sacramento, Ca 95899-7414 (916)327-5106 www.cdph.ca.aov/rhb

Important Notes:

- The use of ionizing radiation is governed by state and federal law.
- The state regulations can be found in Title 17 (Public Health) of the California Code of Regulations:

  http://ccr.oal.ca.gov/linkedslice/default.asp?SP=CCR- 1000&Action=Welcome
- The federal regulations can be found in 10 CFR 20: http://www.gpoaccess.gov/cfr/
- Students are encouraged to access these sources directly for updated, complete and accurate information.

§ 20.1101 Radiation Protection Programs.

(a) Each licensee shall develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part. (See § 20.2102 for recordkeeping requirements relating to these programs.)

(b) The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).

(c) The licensee shall periodically (at least annually) review the radiation protection program content and implementation.