



OPERATING AND SAFETY PROCEDURES BAYLOR UNIVERSITY RADIATION MACHINES

- A. General requirements for research and development, industrial accelerators, and radiation machines. (Note: Electron Microscopes are exempt from these rules.)

These procedures, as followed, will minimize radiation exposure to students, faculty and staff. They are provided to comply with rules enforced by the Texas Department of State Health Services (TDSHS), Radiation Control. The rules require that each facility using X-ray machines, accelerators and/or simulators be registered with TDSHS, Radiation Control.

The certificate of registration contains conditions and restrictions that apply to the operation of the radiation machines in this facility as well as a listing of the sections of the rules that apply. These rules are available for your review at the Texas Department of State Health Services website [See §289.203(b)]. The rules require that a Radiation Safety Officer (RSO) be designated. The RSO has the responsibility and authority for assuring safe radiation practices and serves as the contact person between this facility and the TDSHS. Direct all your questions or concerns on radiation safety to the RSO - contact EHS at 710-2900. [See §289.226(e)(2)].

1. Personnel Monitoring Requirements

- (a). Any adult who is likely to receive a dose from occupational exposure to radiation in excess of 500 millirem in a year must use an individual monitoring device such as a film badge or thermoluminescent dosimeter. Declared pregnant women who are likely to receive a dose from occupational exposure to radiation in excess of 50 millirem during the entire pregnancy must also use an individual monitoring device [See §289.231(n)].
- (b). The individual monitoring device shall be assigned to and must be worn only by one individual [See §289.231(q)(1)(A)].
- (c). Individual monitoring devices must be worn at the unshielded location of the whole body likely to receive the highest exposure. When a protective apron is worn, the location of the individual monitoring device is typically at the neck (collar) [See §289.231(q)(1)(B)].
- (d). Additional individual monitoring devices used for monitoring the dose to the embryo/fetus of a declared pregnant woman must be located at the waist under any protective apron being worn by the

woman [See §289.231(q)(1)(C)]. If multiple individual monitoring devices are worn by a declared pregnant woman, dose to the embryo/fetus and the occupational dose to the woman shall be determined in accordance with the rules [See §289.231(m)(1)(D)(iv)].

- (e). Individual monitoring devices that are not being worn and the control monitoring device will be stored in an area that is away from rooms where radiation machines are in use. This is typically in your office.
 - (f). The RSO is responsible for the occupational dose records and exchanging the individual monitoring devices on a quarterly basis. The individual monitoring device readings (film badge reports) are located at the office of EHS.
 - (g). If you are working for another employer and receive an occupational dose, report that dose to the RSO so that it can be included in your annual record of occupational dose.
2. Posting notices, instructions, and reports to workers; and posting a radiation area.
- (a). Read the "Notice to Employees" sign posted in your work area near the radiation machine.
 - (b). The certificate of registration, operating and safety procedures, and any notices of violations involving radiological working conditions are located on the EH&S website [See §289.203(b)].
 - (c). Your rights and obligations as a radiation worker are found in §289.203(c),(d), and (e) of the rules.
 - (d). The room(s) in which the radiation machine(s) is/are located and operated is a radiation area and is restricted [See §289.231(x)].

3. Radiation incidents and overexposures.

The following incidents, overexposures, or misadministrations should immediately be reported to the RSO.

- (a). stolen, lost, or missing radiation machines [See §289.231(gg)]
 - (b). overexposures [See §289.231(hh)]
4. Annual training and credentialing for operators of equipment.

- (a). Operators of accelerators, x-ray and other radiation emitting machines used in research and development shall receive instruction in and demonstrate competence with the following [See §289.229(f)(4) and 289.228(g)(1)]:
 - (I). operating and safety procedures;
 - (II). radiation warning and safety devices;
 - (III). identification of hazards associated with use of the equipment;
 - (IV). symptoms of an acute localized exposure; and
 - (V). procedures for reporting an actual or suspected overexposure.

This training will be accomplished by classes, one-on-one instruction by a qualified user, or one-on-one instruction by the RSO and may include testing. A record shall be kept of this training [See Appendix A].

- (b). Individuals who operate radiation machines for human use shall meet the appropriate credentialing requirements of rules issued in accordance with the Medical Radiologic Technologist Certification Act, Texas Occupations Code, Chapter 601. Copies of the credentialing document shall be maintained at each facility where the individual is working. [See §289.229(h)(1)(C)].

B. Requirements for accelerators, x-ray and other radiation emitting machines used in research and development. [See §289.229(f)(3)(B) and 289.231(s & v)]:

- 1. The methods used to secure the machine from unauthorized use include maintaining the room locked when not occupied by an authorized user.
- 2. The procedures for testing interlocks, entrance controls, alarm systems, and leakage include:
 - (a). all interlocks shall be tested for proper operation on a yearly basis by the Principle Investigator.
 - (b). all visible or audible alarms shall be tested for proper operation on a yearly basis by the Principle Investigator.

- (c). general area around the machine shall be tested for leakage during machine operation on a yearly basis by the Principle Investigator and/or RSO.

APPENDIX A

SAMPLE RECORD FOR DOCUMENTING
TRAINING AND COMPETENCE IN RESEARCH AND DEVELOPMENT OPERATIONS
for
BAYLOR UNIVERSITY

The following individuals completed training in and demonstrated competence with the items in §289.228(g)(1) and 289.229(f)(4).

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Full Name _____ Date _____

Signature of RSO _____ Date _____

Note: According to §289.227(i)(2)(D), this training is required annually.