SELF-SHIELDED IRRADIATORS

PURPOSE

This procedure presents the requirements for acquisition and use of self-shielded, dry-source-storage irradiators. It also describes the required qualifications and authorization of individuals intending to use such irradiators.

POLICY

The acquisition, installation and use of large gamma-ray irradiators involves long-term commitments of University resources, space and administrative controls. In addition to concerns of safety and security, the issues of long-term custody and ultimate disposal costs must be carefully considered by individuals and departments acquiring an irradiator and by the Radiation Safety Committee (the "Committee").

The complete description of the irradiator and its intended location shall be included with the "RADIATION MACHINE USE APPLICATION" (RPR 2C). The application shall be approved by the Committee before submittal to the licensing agency. No commitment to purchase an irradiator shall be made until the license application has been approved by the Committee.

Individual operators shall complete the specified training prior to use of an irradiator. Operators will also be required to meet trustworthiness requirements per the U.S.NRC guidance for increased controls.

DEFINITION

"Key custodian" refers to an individual responsible for controlling keys to a self-shielded irradiator. An individual who is not an authorized operator may be designated as a key custodian, but the designation shall be done in writing with a copy to the RSO.

AUTHORIZED KEY CUSTODIANS

Blood Bank.

Tony Gatherum, Responsible User
A602 UHOSP, 585-3371 or
Cindy Manning, Transfusion Services
Group Manager
A602 UHOSP, 581-2760

Experimental Oncology

Dr. Raymond L. Warters, Responsible User
BC125 SOM, 581-8344

Center for Applied Dosimetry.

Gerry Kenner, Research Asst. Professor, Responsible User
729 Arapeen Dr., Research Park, Salt Lake City,
Utah 84108, 581-3429
PERSONNEL QUALIFICATIONS AND TRAINING

The responsible user for the irradiator shall submit an application in accordance with "RADIATION USE APPLICATION" (RPR 2). The "RESPONSIBLE USER'S TRAINING & EXPERIENCE" form (RPR 2A) shall clearly demonstrate competency on the subjects listed below.

1. Principles and good practices of radiation protection.
2. The use of radiation detection instruments.
3. The design and operation of the irradiator.
4. Procedures to be followed in the event of an equipment malfunction or other emergency.

Each individual intending to operate a self-shielded irradiator shall submit a completed "RADIATION USER TRAINING & PERSONAL DATA" form (RPR 1A) to the Radiation Safety Officer (RSO), who will schedule appropriate training and administer a written examination for verification of the adequacy of the training.

A list of currently authorized operators of self-shielded irradiators shall be maintained by the RSO. The list will be audited and updated annually. Individuals who have completed the required training and have operated an irradiator will be re-authorized.

To provide an auditable record of use for authorized purposes by authorized operators, an "Irradiator Use Log" shall be maintained. The log may be kept by the key custodian or may be kept at the irradiator. For each occasion of use, the operator should record the date, duration of irradiation and purpose or type of material irradiated. Each entry in the log shall be signed by the authorized operator.

SOURCE SECURITY

Each self-shielded irradiator shall be secured against unauthorized use. If control is by means of a lock on the irradiator itself, the locking device shall prevent any movement of the source or housing, as well as access to the irradiation chamber. An authorized operator may be issued an individual key or may check out a key from the key custodian. Records of keys issued shall be maintained for inspection by the RSO and the licensing agency.

The irradiator keys shall be kept in a location or under conditions that will positively preclude key access and irradiator use by unauthorized individuals. The irradiator keys shall not be duplicated nor turned over to anyone who is not on the list of currently authorized operators.

OPERATING PROCEDURES

A copy of the normal operating procedures, based on the manufacturer's recommended procedures, is to be available at the irradiator control panel. Each user of the irradiator is personally responsible for following the procedures.

Emergency instructions shall be prepared by the responsible user and posted at the control console where they can easily be seen by the operator. The emergency procedures shall contain current names and phone numbers to be notified in the event of:

1. malfunction of the irradiator unit (responsible user, RSO, and the manufacturer), or
2. any event which could physically damage the source, such as fire, explosion, earthquake etc. (University Police, RSO, Fire Department).

The emergency instructions should also inform users in the case of a malfunction to attempt no repairs by themselves, and in the event of possible physical damage of the source to evacuate the area and restrict access until cleared by the RSO.

RADIATION SURVEYS AND MONITORING

A detailed survey of radiation exposure rates in the vicinity of the irradiator and adjacent areas shall be made by the RSO immediately after the initial installation of the irradiator and after any suspected malfunction, modification, or repair of the irradiator. Measurements shall be made both with the irradiator on, i.e. with a sample being irradiated, and with the irradiator off, i.e. with no sample in the cavity and with power to the control unit turned off. The measurements shall be made with a calibrated exposure-rate survey instrument.
Radiation dosimeters shall be worn by all individuals involved in the installation, repair, modification, transfer or disposal of a self-shielded irradiator. Individual operators are required to wear personal dosimeters only if they might receive an exposure from other sources of more than 100 mrem to a major portion of the body in any calendar quarter. (See the Radiation Safety Policy Manual for more information on the policy and procedures for use of personal dosimeters.)

Leak tests of all sealed sources, including those in self-shielded irradiators, are performed by the RSO in accordance with "LEAK TESTS OF SEALED SOURCES" (RPR 51).

REFERENCE


Utah Division of Radiation Control Letter 11/14/05 re: “Administrative Amendment of Utah Radioactive Materials License Number UT1800001 License Action Number 233-2005.