[redacted]

Standard Operating and Quality Assurance Procedures

X-Ray Generating Equipment

Office of Environmental Health and Safety

Revised, 3-9-2022

Equipment Use

Signage

The areas in which x-ray generating equipment are located shall be posted with signage informing those entering that x-ray generating equipment is present. This signage bears the radiation symbol and has the words "Caution – X-Ray Radiation Authorized personnel only." A copy of the Notice to Employees from the ODH also shall be posted in/near the room.

Operation

Each user shall provide the RSO with a written copy of instructions detailing st- by-step operation of the equipment as well as a copy of the manufacturer's op manual, if available. Should any of the operating procedures be modified for any reason, the revised procedure should also be forwarded to the RSO.

Dosimetry

The main goal of the CSU Radiation Safety Program and procedures for workin X-Ray Generating Equipment are to minimize exposure to radioactive materials, and to the radiation levels they may produce, to a level that is AS LOW AS REASONABLY ACHEIVABLE (ALARA). Various types of x-ray generating equipment require the use of personal dosimeters/film badges by the operator. are designed and equipped with a series of internal safety features that automa deactivate the x-ray unit which eliminates the need for film badge monitoring. Whether or not a film badge is required for use will be determined by the RSO reviewing the operator's manual and proposed experiment. If film badges are required, each individual who operates an x-ray generating device will be issued a film badge. The Department of Environmental Health and Safety replaces film badges on a quarterly basis and maintains a dosimetry report of all personnel i film badge. Each individual who is issued a radiation film badge shall be provided with an annual personal dosimetry report. Film badges cannot be removed fror operating area for any reason and should never be worn off campus.

The Radiation Safety Office also has a limited number of spare badges which r issued in emergency situations (i.e. when individuals not normally issued a badge, such as maintenance personnel who must enter a radiation area to perform maintenance work). In accordance with provisions set forth in the *Ohio Administrative Code 3701:1-38*, the maximum permissible exposures for CSU personnel are:

Maximum Permissible Dose (Annual)

Should an exposure report indicate an individual has received an exposure ir of 20 mRem, the RSO will notify the individual as soon as possible. The RS make every effort to identify the cause of the exposure and take corrective ac eliminate the source. All whole body exposures indicated in excess of 200 mRem for a reporting period will result in the RSO immediately halting further use of radioisotopes until the cause of the reported exposure is determined.

In the event exposures in excess of levels set forth in the *Ohio Administrative Code 3701:1-38-12 and 3701:1-38*-13, the RSO will notify the Ohio Department of He in writing within thirty days after learning of the overexposure. Corrective act may include, but is not limited to revising specific standard operating procedures in an individual lab, having the x-ray generating equipment evaluated by a manufacturer's service representative, and the use of additional shielding.

Exposure reports are available for individual review their values by making an appointment with the RSO. Upon receipt of a signed releasnt8s l 126 237.l graduate and undergraduate students using x-ray generating equipment are adequately trained and the documentation of this training is recorded.

Regulatory Guide 8.13 – Instruction Concerning Prenatal Radiation Exposure

All females who will be working with x-ray generating equipment must be provided a copy of Regulatory Guide 8.13 – Instruction Concerning Prenatal Radiation Exposure (Nuclear Regulatory Commission) as part of their training.

Should any female working with x-ray generating equipment decide to declare their pregnancy, the ***"Declaration of Pregnancy"*** form shall be used for this purpose.

Repair of X-Ray Equipment

Operators are required to monitor performance of x-ray generating equipment, and to noti the RSO of any erratic operating patterns and possible exposure. Should any x-ray generating unit require maintenance and/or repair, the RSO should be notified and copies of any documents pertaining to the repair shall be forwarded to the Department of Environmental Health and Safety.

Relocation/Disposal of X-Ray Generating Equipment

If the intent exists to relocate a piece of x-ray generating equipment from its original loca to another site, be it within the same building or to a different building, the RSO shall notified in writing.

If an x-ray generating unit is slated for disposal, the RSO shall be notified in writing so that the University's Certificate of Registration with the ODH Bureau of Radiological Heal properly amended. All copies of documentation pertinent to the disposal of each x-ray unit shall be forwarded to the RSO. This includes a letter of intent to dispose of the x-ray generating equipment which includes information that specifically identifies each unit (model, serial number, CSU tag number), as well as correspondence from the CSU F Control Department confirming removal of the x-ray unit from the University's inventory.

Equipment Inventory

Periodically, the RSO will request an inventory of all x-ray generating equipment be taken. These records will be kept on file and will aide in ensuring that information contained on the University's Certificate of Registration with the ODH is current a accurate. Leybold units are calibrated before use maintenance schedule is not recommended, DEXA is calibrated prior to use every time, maintenance is when needed per manufactures recommendations.

Quality Assurance

Each registered piece of x-ray generating equipment will be evaluated at six month inter by the Radiation Safety Officer to ensure. The evaluation consists conducting a radi survey of each piece of x-ray generating equipment while activated and in use in accordance with established operating procedures set forth for each unit by trained personnel. Dissemination of information to workers is through verbal means and/or email to the employee.

Appendix A Documentation of

Training Form

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Cleveland State University
Environmental Health & Safe
X-Ray Radiation Training

Employee_________________________________ Date_________________________ A

Concentration:

- Fundamentals of Radiation □ Effects of X- Radiation
- Radiation Exposure □ Biological Effects
- Dosimetry □ Radiation Safety (ALARA)
- Monitoring □

Appendix B
X-Ray Generating Equipment
Safety Training Program

Appendic C: Equipment list

location	type	user	manufacturer	Model #	kV	uA	serial#	operable	calibrated
SH 25	sem	tara							