Environmental Health & Safety Policy Manual		
Issue Date: 12/08/2009	Updated: 5/30/2024	Policy #: EHS-100.05
X-Ray Machine Inspection Policy		

1.0 PURPOSE:

To ensure all X-ray machines at LSUHSC are properly inspected in accordance with radiation protection regulations and campus radiation safety committee guidance.

2.0 SCOPE:

This policy informs the X-Ray machine operator/inspectors/owners what items are to be addressed during the required inspection and before a Louisiana State Department of Environmental Quality (DEQ) X-ray machine audit.

3.0 RESPONSIBILITIES:

3.1 Radiation Safety Officer (RSO) shall:

- Perform all dental and veterinarian X-ray machine inspections every 3 years.
- Verify that all medical X-ray machine inspections are completed annually.
- Maintain all inventory records of X-Ray devices and inspection results.

3.2 Department X-Ray Owners shall:

- Notify RSO of any new X-ray machine purchase to ensure proper DEQ registration.
- Notify RSO of any X-ray machine removal.
- Notify RSO of any X-ray relocations.
- Notify RSO of any X-ray repairs and/or modifications.

4.0 IMPLEMENTATION REQUIREMENTS:

4.1 Inspection Requirements:

- Inspections shall be performed at determined intervals (See Section 3.1) and after any X-ray machine relocation, modification, or repair.
- The following items are required in the immediate equipment area of every X-ray unit:
  - Copy of DEQ Registration License.
  - Copy of DRC-3 form.
  - Technique chart which indicates what time duration (ms) and milliamp (ma). values are used for different patient sizes and/or body parts.
  - Warning Label posted on machine.

- Exposure indication of a visual or audible type when X-rays are produced.
- Shielding to protect the patient from scatter X-rays. A lead apron should be worn except for direct focused dental machines.
- Operator shall stand at least 12 feet from tube housing while making exposures or shall stand behind approved leaded glass shield.
- Ensure the DEQ registration license is correct (e.g., serial #, model #).
- Ensure the operator is located at least 12 feet from tube housing while making inspection exposures. Operator may stand behind glass leaded shield.
- X-Ray inspection specific tasks include recording the following:
    1. Exposure Duration (Time) Reproducibility test (use 4 timing tests)
    2. Exposure Reproducibility test (use 4 exposures made in one hour)
    3. Linearity test (if equipment allows choice of X-Ray current settings)
    4. Accuracy test (no more than 10% error from one reading to another)
    5. Use Appendix A, Form RS 04, X-ray Inspection Form, to record results.

5.0 RECORDKEEPING:

Copies of all inspections must be on file at the unit's location, with the RSO, and be monitored for the current fiscal year and the previous three fiscal years.

6.0 INSPECTIONS AND PROGRAM REVIEW:

This procedure shall be performed at the determined intervals (See Section 3.1) schedule or whenever there are any modifications or repairs to the X-ray machine.

7.0 REFERENCE:

LA DEQ Title 33, Part XV - Sections 603, 604 and 608

8.0 APPENDIX:

A. Radiation X-ray Inspection Form

LSU-HSC Radiation Safety Office
X-Ray Machine Inspection

Facility Name _____ Facility Location _____ Date _____
Building Name _____ Room # _____ Specific location _____
Unit Type_____(Dental, Medical, etc.) **State DEQ Registration #** _
Manufacturer _____ Model _____ Serial # _____
Max kVp _____
Person Interviewed _____

Most Frequent Exam Setting
kVp _____ mA_____time _____

**Note: Instruments used for measurements* _____ *Scatter Survey Instrument* _____

TIMER/EXPOSURE REPRODUCIBILITY TEST *Based on settings*:_____*kVp* _____*mA* _____*mSec*

$(T_{max} - T_{min}) \leq 0.1\ T_{avg}$ **(needs to be less than 10% error)** $(E_{max} - E_{min}) \leq 0.10\ E_{avg}$ **(needs to be less than 10% error)**

	Dose Reading (mR)	**Time (mS)**	**(kVp)**	**(Hvl)**
1				
2				
3				
Avg				

Scatter Radiation Measurements

Operator @ 12 feet=_____ uR/ hr exp

uR per sec=_____ x exp per sec_____

=uR per exp_____

Table 1 - values must be greater than ones shown below

Design Operating Range System	**Measured Potential (kVp)**	**Dental Intraoral Manufactured before 8/1/74 and on or before 12/1/80**	**All Other Diagnostic X-ray Half-Value Layer (mm of Aluminum)**
Below 51	30	N/A	0.3
	40	N/A	0.4
	50	1.5	0.5
51 to 70	51	1.5	1.2
	60	1.5	1.3
	70	1.5	1.5
Above 70	71	2.1	2.1
	80	2.3	2.3
	90	2.5	2.5
	100	2.7	2.7
	110	3.0	3.0
	120	3.2	3.2
	130	3.5	3.5
	140	3.8	3.8
	150	4.1	4.1

Facility Equipment and Design

___ Registration Certificate ___DRC 3 Posted ___Technique Chart Posted
___ Adequate Signs Posted ___Shielding/Aprons provided

___ Dead man Type Exposure Switch ___Exposure Switch Located Adequate ≥ 10 feet from tube

___ **NO DEVIATIONS FOUND** ___ **DEVIATIONS FOUND**

Comments:

Inspection performed by _____ **DATE**_____