

Environmental Health & Safety Policy Manual		
Issue Date: 12/08/2009	Updated: 1/6/2012	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 shall:

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

3.2 X-Ray machine owners shall:

- Notify Radiation Safety Officer on any new X-ray machine purchase to ensure proper DEQ registration.
- Notify Radiation Safety Officer on any X-ray machine removal.

4.0 IMPLEMENTATION REQUIREMENTS:

4.1 Inspection Requirements

- Inspections shall be performed at quoted intervals and after any X-ray machine modification or repair.
- The following placard signage is required for 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.

4.2 X-Ray machine annual inspection specific tasks

- Ensure the DEQ registration license is correct (e.g., serial #, model #).
- Ensure operator is located at least 12 feet from tube housing while making inspection exposures. Operator may stand behind glass leaded shield.

Tasks include:

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 Annual Inspection Form, to record results.

5.0 RECORDKEEPING:

Copies of all inspections must be on file at units' location and 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 quoted 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 _____	Most Frequent Exam Setting kVp _____ mA _____ time _____	
Person Interviewed _____		

*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 = _____ μ R/ exp

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 \geq 10 feet from tube | |

___ **NO VIOLATIONS FOUND** ___ **VIOLATIONS FOUND**

Comments:

Inspection performed by _____ DATE _____