Chapter 4

General Fluoroscopic Units

Minimum Required Personnel Qualifications:

Level I (Basic X-ray Surveyor)

Testing Periodicity:

All units: Annually, upon acceptance and after major repairs

Instrumentation:

1. Electrometer with large and small ion chambers ($6\ cm^3$ and $180\ cm^3$ nominal vols)
2. 10+ step Aluminum wedge (digital RF units)
3. Exposure rate compatible digital kVp meter
4. High resolution test patterns
   a. RMI® 141, 141-H (low/high level)
5. Penetrameter kit
   a. 2 Al plates (17.8 cm x 17.8 cm x 1.9 cm)
   b. Lead plate (20 cm x 20 cm x 1.6 mm)
   c. 1.5, 3.1, 4.7, & 6.3 mm perf. Al sheet (17.8 cm x 17.8 cm x 0.8 mm)
6. 1100 Al alloy sheets (10 cm x 10 cm) (varying thicknesses; at least 5 mm total)
7. Densitometer
8. Collimator/beam alignment test tool
   a. Etched plate (25 cm x 20 cm x 1.5 mm)
   b. Plastic cylinder with imbedded steel balls
   c. Two dimensional level
9. Tape measure
10. Film/screen cassette with appropriate film (14" x 17", 35 cm x 43 cm)
11. Optional
    a. BRH test stand
    b. Screen-film contact test tool
    c. Copper plate (20 cm x 20 cm x 1.5 mm)
    d. Acrylic phantom (30 cm x 30 cm x 18+ cm)

References:

1. AAPM Report 12. *Evaluation of Radiation Exposure Levels in Cine Cardiac Catheterization Laboratories*, 1984.
2. AAPM Report 25. *Protocols for the Radiation Safety Surveys of Diagnostic Radiological Equipment*, 1988.
3. AAPM Report 35. *Recommendations on Performance Characteristics of Diagnostic Exposure Meters*, 1992.
4. Chakraborty, D.P. *Routine Fluoroscopic Quality Control*, 1991 AAPM Summer School Proceedings, 1994.
5. Code of Federal Regulations, Title 21, Chapter 1, Section 1020.30, 1020.31, 1020.32; 1 April 1996 edition.
6. Curry, T.S. III, Dowdey J.E., Murry, R.C. Jr. *Christensen's Physics of Diagnostic Radiology, Fourth Edition*, Lea & Febiger, Philadelphia. 1990.
7. Gray, J.E., Winkler, N.T., Stears, J., Frank, E.D. *Quality Control in Diagnostic Imaging*, University Park Press, Baltimore, 1983.
8. Lin, P.J.P. *Technical Considerations of Equipment Selection and Acceptance Testing of Cardiovascular Angiography Systems*, 1991 AAPM Summer School Proceedings, 1994.
9. NCRP Report 99. *Quality Assurance for Diagnostic Imaging Equipment*, 1988.
10. *Quality Assurance for Fluoroscopic X-ray Units and Associated Equipment*, Bureau of Radiological Health, Rockville, MD; October 1979.