X-R-I TESTING
DIVISION OF X-RAY INDUSTRIES, INC.

Digital Radiology

Course Outline

1. Digital Radiologic Imaging
    a. Digital Imaging Basics
    b. Conversion processes and comparisons
    c. Advantages/disadvantages of digital imaging
    d. Industry acceptance
    e. Future direction

2. History of Digital Radiology
    a. Fluoroscopes to aSe detectors - evolution
    b. Industrial digital RT and consumer product development
    c. Medical based technology for radiology - the parallels

3. Radiology Fundamentals
    a. Applications specifics
    b. Discontinuity orientation sensitivity and detection
    c. Geometric variables
    d. Image quality (spatial resolution, contrast sensitivity
    e. Radiation quality variables
    f. Component coverage

4. Conversions: Digital Imaging Modalities
    a. Computed Radiology (CR)

    4.1. Introduction
        a) Condensed History
        b) Digital imaging technology
        c) CR Systems and procedure overview

    4.2. CR Subsystems (Image plates, Laser scanner, Workstations)
        a) IP composition
        b) IP characteristics
        c) IP care and maintenance
        d) Laser scanner operation
        e) Laser scanner specifics
        f) Laser scanner maintenance
        g) Workstation environment
        h) Monitor specifics
        i) Imaging processing functions

4.3. Operational Requirements

a) Applicable ASTM specifications, Standards, Guides and Practices
b) Customer or prime specifics
c) System performance measurements the CR Phantom
d) System capability
e) System qualification – image quality
f) CR technique Parameters

4.4. PRACTICAL SESSION

a) CR Phantom: system performance gauging
b) IP protocol: erasure, registrations, damage study
c) CR enhancement: use of filtration and masking, exposure considerations, control of scatter.

i. Direct/Digital Array Radiology (RD/DDA)

- DR: aSi Detectors
- DDA: aSe Detectors

Composition; Distinctions; Advantages; disadvantages; applications

ii. Linear Diode Arrays (LDA)

- Composition; Distinctions; Applications

iii. Computed Tomography (CT)

- Systems and detectors; characteristics; advantages; application

iv. Radioscopy (Real Time/RTR)

- Detectors; systems; advantages; disadvantages; applications

v. Other Quantum Detectors and Imaging Modalities

- Charge Coupled Device (CCD); Complimentary Metal Oxide Semi-Conductor (CMOS); Reverse Geometry (RGX)

5. Terms and Definitions Relating to Digital Radiology

6. Final Comprehension Assessment