

Radiographic Training--Level 1

Course Outline

1. Introduction
 - * NDT Introduction
 - * Facility Tour & Method Demonstrations
2. Radiation Origin & History
 - * Basic Structure Of Matter
 - * Radiation Characteristics
 - * Ionization/Scatter
 - * Origin and Types of Radiation
 - * Radiation Discovery and Historical Events
 - * Industrial Radiography Beginnings
3. Radiation Safety
 - * Radiation/Interactions and Origin Review
 - * Units of Radiation Measurement
 - * Radiological and Biological Effects
 - * Exposure Reductions/ALARA
 - * Requirements and Regulations
 - * Personnel Monitoring and Monitoring Equipment
 - * Equipment Requirements
 - * Emergency Response/Employee Notifications
 - * Personnel Training and Qualifications
4. Basic CP X-ray Systems & Subsystems
 - * Tube Head
 - * High Voltage Generators
 - * Control Panel
 - * Cooler
 - * High Voltage Cables
 - * Radiation Enclosures
5. Special Radiation Generating Systems
 - * High Energy X-Ray
 - * Portable X-Ray Systems
 - * Mini Focus X-Ray Systems
 - * Micro-Focus X-Ray Systems
 - * Gamma Radiography

- * Special Radiation Generating Systems (Continued)
- * Rod Anode
- * Neutron Radiography

6. Imaging Modalities

- * Film Radiography
- * Computed Radiography (CR)
- * Digital Radiography (DR)
- * Radioscopy/Real Time Imaging
- * Computed Tomography (CT)
- * Other Imaging Methods

7. Automatic Film Processing

- * Operational Overview
- * Film Systems
- * Darkroom Operations
- * Chemistry Systems
- * Mechanical Systems
- * Controlling Factors/Common Malfunctions
- * Discharge Considerations
- * Start-Up/Shut Down
- * Maintenance

8. Radiographic Quality Process Variables

- * Test Specimen Coverage
- * Exposure Parameters
- * Geometric & Spatial Relationships
- * Radiographic Density
- * Image Quality
- * Scatter Control
- * Radiographic Identification
- * Radiographic Technique

9. Ed-Lab Exercise: Full Technique Development & CR Comparison

- * Students Choose A Test Specimen & Fully Develop An RT Technique(s) IAW/XRI 4004 /ASTM E 1742
- * Student Will Develop “CR” Technique For Comparison Of Parameters & imaging quality results

10. Procedures & Specifications – History & Applications

- * ASTM E-1742 Full Review & Discussion – Open Book Quiz
- * Full Review & Discussion, Demonstrations of Process
- * Controls, Verifications & Calibrations – Review
- * Comprehensive Review Of Unique Customer Requirements

11. Material Processes Training

- * OJT XRI 2003 FORMS: Full Review & Discussion of All Checkpoints
- * Materials & Processes – Product Formss & Applications
 - o Castings & Weldments
 - Investment Casting
 - Sand Casting
 - General Welding
 - TIG Welding

(Materials and Processes instruction supplemented with videos and review of selected sample radiographs)