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

   * 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 Forms & 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)