

Non-Destructive Testing Courses by TCR Arabia (1/5)

Radiography Testing – Level II

COURSE OUTLINE

Review of Basic Radiographic Principles

- Interaction of radiation with matter.
- Math review
- Exposure calculations
- Geometric exposure principles
- Radiographic-image quality parameters

Darkroom Facilities, Techniques, and processing

Facilities and equipments

1. Automatic film processor vs manual processing
2. Safe lights
3. Viewer lights
4. Loading lights
5. Miscellaneous equipments

Film loading

1. General rule for handling unprocessed film.
2. Types of film packaging
3. Cassette-loading techniques for sheet and roll

Protection of radiographic film in storage.

Processing of film – manual

1. Developer and replenishment
2. Stop Bath
3. Fixer and replenishment
4. Washing
5. Prevention of water spots
6. Drying

Automatic film processing

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Film filing and storage

1. Retention-life measurements
2. Long term storage
3. Filing and separation techniques

Unsatisfactory Radiographs :- causes and cures

1. High film density
2. Insufficient film density
3. High contrast
4. Low contrast
5. Poor identification
6. Fog
7. Light leaks
8. Artifacts

Film density

1. Step-wedge comparison film
2. Densitometers

Indications, discontinuities, and defects

Indications

Discontinuities

1. Inherent
2. Processing
3. Service

Defects

Manufacturing Processes and Associated Discontinuities

Casting processes and associated discontinuities

1. Ingots, blooms, and billets
2. Sand casting
3. Centrifugal casting
4. Investment casting

Wrought processes and associated discontinuities

1. Forgings

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1. Rolled products
2. Extruded products

Welding processes and associated discontinuities

1. Submerge arc welding (SAW)
2. Shielded metal arc welding (SMAW)
3. Gas metal arc welding (GMAW)
4. Flux corded arc welding (FCAW)
5. Gas tungsten arc welding (GTAW)
6. Resistance welding
7. Special welding processes- electron beam, electro slag, electro gas, etc.

- Controlling personal exposure
- Time, distance, shielding concepts
- ALARA (as low as reasonably achievable) concepts
- Radiation-detection equipments
- Exposure device operating characteristics

Radiographic Viewing

- Film illuminator requirements
- Background Lighting
- Multiple-Composite viewing
- Penetrameter placement
- Film identification
- Location markers
- Film density measurements
- Film artifacts

Radiological safety principles Review

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Application Techniques

- Multiple film techniques
 1. Thickness-variation parameters
 2. Film speed
 3. Film latitude
- Enlargement and projection
- Geometrical relationships
 1. Geometrical unsharpness
 2. Penetrameter sensitivity
 3. Source -to -film distance
 4. Focal-spot size
- Triangular methods for discontinuity location
- Localized magnification
- Film handling techniques

Evaluation of castings

- Casting-methods review
- Casting discontinuities

- Origin and typical orientation of discontinuities
- Radiographic appearance
- Welding codes/standards-applicable acceptance criteria
- Reference radiographs or pictograms

Evaluation of weldments

- Welding-method review
- Welding discontinuities
- Origin and typical orientation of discontinuities
- Radiographic appearance
- Welding codes/standards-applicable acceptance criteria
- Reference radiographs or pictograms

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Radiography Testing – Level II

Standards, codes and Procedures for Radiography

- ASTM E94/E142
- Acceptable radiographic techniques and setups
- Applicable employer procedures
- Procedure for radiograph parameter verification
- Radiographic reports.

The duration of this course is for 5 days and it is conducted by NDT experts from TCR Arabia. Students will be given an ASNT Level II certificate at the end of this course.

All courses, unless specified in advanced with the client, will be conducted at the training facility located at: **TCR Arabia Limited | Gas Gardens, King Abdulaziz Seaport, Dammam, Saudi Arabia**