Automatic Ultrasonic Testing (AUT) Interpreter *Training (82 hours)*

Module	Subjects	Duration
Introduction	o Terminology o Basic Principles of Phased Array for AUT o Responsibilities of levels certification	4 hours
Equipment	o Introduction to AUT software o Focal laws Generator o Probes, Pitch, gap and size, Passive planes, Active planes, Wedges o Beam and wave forming o Scanner	14 hours
Testing Techniques	o Zone Discrimination o TOFD	14 hours
Calibration	o Velocity o Sensitivity o Wedge delay	14 hours
Data Collection	o Encoded scans o Zone Discrimination Representation	8 hours
Analysis	o Analysis theory o Geometric reflection	24 hours

Reporting	o Typical defects	
	o Defect Interpretation & Sizing	
	o Imaging outputs;	4 hours
	o On-board reporting tools;	
	o Plotting, ACAD, etc.	

Automatic Ultrasonic Testing (AUT) *Training (112 Hours)*

Module	Subjects	Duration
Introduction	o Terminology o Basic Principles of Phased Array for AUT o Responsibilities of levels certification	8 hours
Equipment	o Introduction to AUT software o Focal laws Generator; o Probes, Pitch, gap and size, Passive planes, Active planes, Wedges o Beam and wave forming o Scanner	14 hours
Testing Techniques	o Zone Discrimination o TOFD	14 hours
Calibration	o Calibration Block Design o Velocity o Sensitivity o Wedge delay	16 hours
Setup Preparation Data Collection	o Setup Preparation o Encoded scans o Zone Discrimination Representation	24 hours

	o Weld inspection	
Analysis	o Analysis theory o Geometric reflection o Typical defects o Defect Interpretation & Sizing	24 hours
Trouble shooting	o Mechanic & electronic o Typical problems on field o Maintenance	8 hours
Reporting	o Imaging outputs; o On-board reporting tools; o Plotting, ACAD, etc.	4 hours

Phased Array Ultrasonic Testing (PAUT) *Training(82 hours)*

(Module	Subjects		Duration
Introduction	o	Terminology	2 hours
	o	Responsibilities of levels certification	
Basic principles of Phased Array Equipment	o	Review of ultrasonic wave theory	8 hours
	o	Introduction to PA concepts and theory.	
	o	Introduction to AUT software	8 hours
	o	Focal laws Generator;	
	o	Probes, Pitch, gap and size, Passive planes, Active planes, Wedges	
	o	Beam and wave forming	
	o	Scanner	
Testing Techniques	o	Calibration Block design	8 hours
	o	Linear Scans	
	o	Sectorial Scans	
	o	Electronic Scans	
Calibration	o	Calibration Block Design	12 hours
	o	Velocity	
	o	Sensitivity	
	o	Wedge delay	

Data Collection	o Single probes	10 hours
	o Time-based data storage	
	o Encoded scans	
	o Line scans	
	o Raster scans	
	o Zone discrimination	
	o Scan plans and exam coverage	
	o Probe offsets and indexing	
Procedures	o Weld inspection	14 Hours
	o Data Presentation	
Data Evaluation	o Codes/standards/specifications	16 hours
	o Flaw characterization	
	o Flaw dimensioning	
	o Geometry	
	o Software tools	
	o Evaluation gates	
Reporting	o Imaging outputs	4 hours
	o On-board reporting tools	
	o Plotting, ACAD, etc	

TOFD *Training (42 Hours)*

Module	Subjects	Duration
Introduction	○ Terminology ○ Responsibilities of levels certification	2 hours
Basic principles of ToFD	○ Review of ultrasonic wave theory ○ Introduction to TOFD concepts and theory ○ Technique Limitations	4 hours
Equipment	○ Computer Based Systems ○ Beam Profile tools ○ Probes and Wedges ○ Scanners	4 hours
TestingTechniques	○ Phased Array ToFD ○ Conventional ToFD	2 hours
Calibration	○ Calibration Block Design ○ Wedge delay Material velocity calculations ○ Combined probe Delay(s) calcutation(s) ○ Digitization rates and sampling ○ Signal averaging ○ Pulse width control ○ PCS and angle selection ○ Sensitivity	8 hours

Data Collection	o Pre-amplifiers	
	o Single probe setups and Multiple probe setups	8 hours
	o Non-encoded scans	
	o Time-based data storage	
	o Encoded Scans	
	o Probe offset and Indexing	
Procedures	o Weld inspection	8 hours
	o Data Presentation	
Data Evaluation	o Codes/standards/specifications	8 hours
	o Flaw characterization	
	o Flaw dimensioning	
	o Geometry	
	o Software tools	
	o Linearization	
	o Lateral/back wall straightening and removal	
	o Synthetic aperture focusing technique (SAFT)	
	o Spectrum processing	
	o Curved surface compensation	
	o Parabolic cursor(s)	
Reporting	o Imaging outputs	2 hours
	o On-board reporting tools	
	o Plotting, ACAD, etc	