

# Phased Array Ultrasonic Testing - Level II

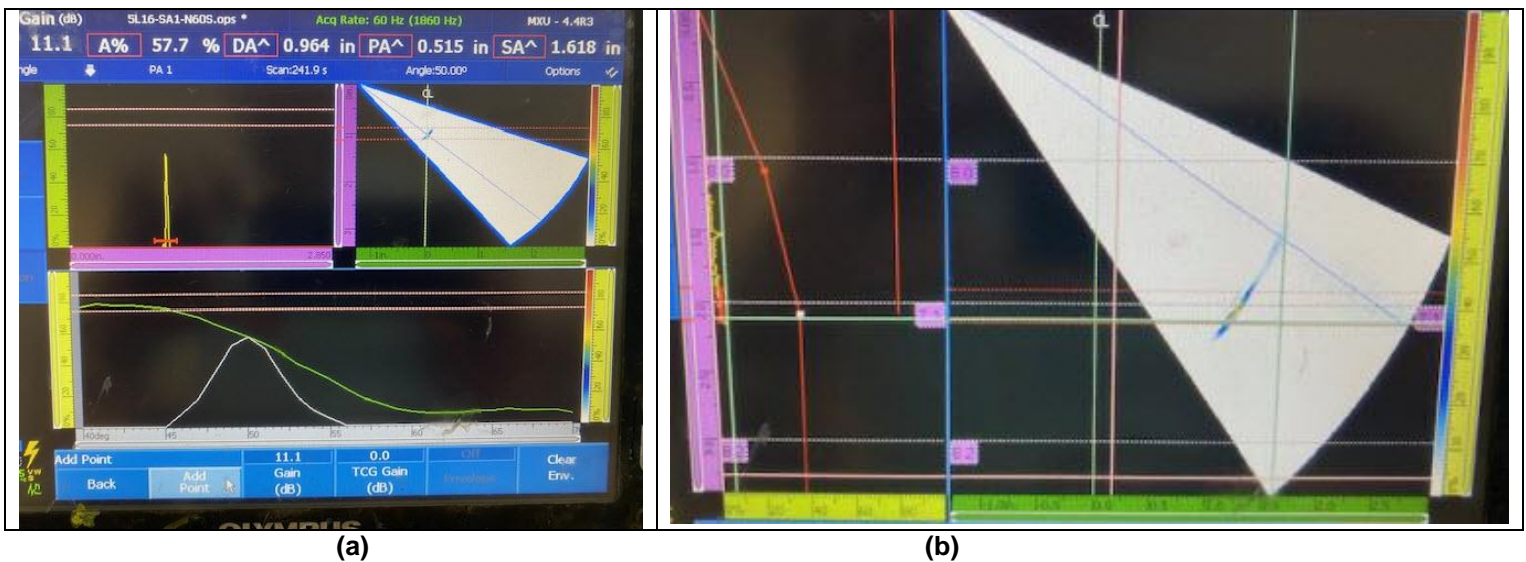
Specific Training 80 hours

Training Course Outline

## SCOPE

This course introduces the basic principles of ultrasonic phased arrays and prepares the candidate use Phased Array for ultrasonic examinations. Training will include practicals on plates/pipes with embedded flaws

The training is conducted over a two week period to meet the requirements of SNT-TC-1A 2020.



Building TCG to Establish Reference Level for Code Inspections. (a) Signal prior to TCG showing amplitude decrease with angle (b) after TCG all angles set to reference level

## Training Modules

**Module 1: Phased Array Level II Certification as per SNT-TC-1A 2020**

**Module 2: Phased Array Physics**

- Beam Profile of a Conventional Probe
- Near Field and Beam Spread
- Conventional Focusing
- Phased array Focusing using Time Delays
- Beam Steering and Element Size
- Menus, Submenus

### **Module 3: Omniscan Instrument Menus**

- UT Settings, Gain, Sound path range
- angle range, Focal laws

### **Module 4: Omniscan Setups**

- Probe and Wedge selection
- Straight beam and Angle beam

### **Module 5: Probe and Wedge**

### **Module 6: Depth Calibration**

- Velocity
- Wedge delay

### **Module 7: Reference Level Calibration**

- Sensitivity: Equalizing amplitude over angles for single depth
- Time Control Gain TCG: Equalizing amplitude over angles for multiple depths

### **Module 8: Element Check**

### **Module 9: Weld Inspection**

- Setup
- Probe/Part
- Welding codes and TCG Calibration
- Scanning Weld Samples

### **Module 10: Straight Beam Inspection**

- Probe Selection
- Focal law
- Sensitivity Calibration
- Sweep Angle

### **Module 11: Flaw Definition and Sizing**

### **Module 12: Encoded Scans**

- Setup of scanner
- Encoder Calibration
- Scanning Weld Samples

**Module 13: PAUT in lieu of RT**

- ASME Section V, Article 4, Appendix VIII and IX
- ASME Section VIII, Section 7.5.5 (previously Code Case 2235-09)
- B31.3 Code Case 181-2, Use of Alternate Acceptance Criteria
- Examples of Accept/Reject

**Module 14: Phasor Menus and Setup**

- Menus
- Setting
- Setting sectorial scan

**Module 15: Phasor Calibration**

- Sound velocity
- Wedge Delay
- Sensitivity
- TCG

**Module 16: Special Applications; Inspection of stainless steel, duplex steels and A 625 welds using refracted L-waves**

- Generating of Refracted L-waves
- Limitation of Refracted L-waves
- Inspection of welds in stainless steels and duplex steel
- Inspection of A625 closure welds
- Inspection of A625 clad

**References**

Anmol Birring, "Phased Array Ultrasonic Testing – A Tutorial" Quality Magazine, July 2023

**EXAMINATIONS**

- General
- Specific
- Practical

Candidates must score a minimum of 70% in each written tests, 80% in practical test and a 80% average for all the three tests.



## Birring NDE Center

515 Tristar Drive

Webster, Texas 77598

832-533 8366

email: [training@nde.com](mailto:training@nde.com)

[www.nde.com](http://www.nde.com)