TechKnowServ (TKS) Phased Array Ultrasound training courses are designed to satisfy ISO 9712, Non-destructive testing — Qualification and certification of personnel and the American Society for Nondestructive Testing (ASNT) SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing.

All courses are designed by Thomas R. Hay, Ph.D., P.E., ASNT UT Level III since 2001, active in advanced nondestructive testing and research and development for over 20 years.

TKS is an [authorized training partner](http://www.olympus-ims.com/en/training-members/) of Olympus NDT Training Academy.

The course is 80 hours long (10 days). The student is required to successfully pass a general and practical exam at the end of the course, as required by the ISO/ASNT standards.

The instructor is available to travel to the client site to provide the training as well. Instructor travel, lodging & boarding costs will apply.

Please contact Thomas Hay, President, TKS for any further details or clarification.

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Course Outlines are provided in the following pages.

**Phased Array UT Level II Course Outline – Week 1**

1. **Introduction to Phased Array Ultrasound**

- General introduction to PAUT  
- History of PAUT  
- Advantages and limitations of PAUT  
- PAUT system components  
- Ultrasonic phasing

2. **Phased Array Probes**

- Ultrasonic beam characteristics  
- Fundamental properties of sound waves  
- Phased array probe characteristics  
- Phased array wedges  
- Phased pulsing  
- Beam shaping and steering  
- Beam focusing with phased array probes  
- Grating lobes and side lobes  
- Phased array probe selection summary

3. **Basics of Phased Array Imaging**

- A-Scan data  
- Single value B-Scans  
- Cross-sectional B-Scans  
- Linear Scans  
- C-Scans  
- S-Scans

4. **Phased Array Instrumentation**

- Example specification  
- Product comparisons  
- Calibration and normalization methods

5. **Phased Array Test Setup and Display Format**

- Instrument setup consideration  
- Normal beam linear scans  
- Angle beam linear scans  
- S-Scan display examples  
- Interpreting reflector positioning

**Phased Array UT Level II Course Outline – Week 2**

1. **Phased Array Applications**

- Aerospace industry  
- Power generation industry  
- New and in-service pressure vessels  
- Oil and natural gas pipelines  
- Thermite welds in rail track

2. **Phased Array Probes**

- Review of near and far field  
- Phased array probes and sound fields  
- Active apertures  
- Passive apertures  
- PAUT wedges  
- Focal depth and range  
- Index point length  
- Dynamic depth focusing  
- Setting up a probe

3. **Focal Laws and Ray Tracing**

- A-Scan data  
- Single value B-Scans & Cross-sectional B-Scans  
- Linear Scans, C-Scans & S-Scans  
- Combined image formats  
- Scan rate and data acquisition

4. **Weld Inspection**

- Weld inspection code review  
- Probe and wedge selection and setup  
- Weld geometry setup on instrument  
- Calibration and normalization methods  
- Flaw Sizing  
- Encoder operation and setup

5. **PAUT in lieu of Radiography**

- ASME Section V and Code case 2235 and 181