***TECHKNOWSERV CORP. 2024 Non-destructive Testing Training Catalog, Schedule, and Rates***



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# Why Choose TKS?

For over 20 years TKS’ staff have worked at the highest level in non-destructive testing R&D, engineering services, inspection services, training and education. TKS has over 400 clients worldwide, many of which are returning customers. Our educational specialists are required to provide field services and are not exclusively classroom instructors. As a result, you will receive the ***theoretical*** and ***practical*** training that you require to be a successful NDT inspector. TKS is an approved Olympus NDT training partner.

Launched in 2020 and continuing in 2024, TKS offered remote learning with the option to perform practical tests remotely. The hybrid approach is cost effective but requires additional logistics to be met.

# Lead Instructor and NDT Course Designer Biography

Thomas R. Hay, Ph.D., P.E. and ASNT Level 3 #107162 has over 20 years of NDT experience and thousands of hours of training experience. He received his Ph.D. from Penn State University’s prestigious Ultrasonic Lab and has been an ASNT Level 3 since 2001. Additionally, he is a practicing P.E. in U.S. and Canada.

His career started in NDT product development building automated ultrasonic and eddy-current inspection solutions.

After many years in product development, he spent more than a decade performing R&D at the highest levels for different clients including the National Science Foundation, Department of Energy, Department of Defense, Transport Research Board, and Department of Transportation.

In parallel he has led an engineering and non-destructive testing service line for a variety of clients world-wide. As of 2020, Dr. Hay has over 400 clients worldwide.

# Training and Related Services

TKS provides formal classroom and client-site training for nondestructive testing professionals. Training classes are designed according to ASNT-TC-1A, CP-189, NAS 410 and ISO 9712 standards.

Personnel qualification services include documentation review, training, and qualification examinations. Documentation review is performed to assure education, training, experience and qualification exams meet the client's codes, specification and requirements.

Written, general, and specific examinations meeting the client's code, specification and/or requirements in accordance with ASNT Recommended Practice SNT-TC-1A, ANSI/ASNT CP-189-2006, ACCP, and NAS 410.

Procedure development and review backed by industry experience combined with extensive involvement with ASNT and ASTM standards development ensures document(s) acceptable for use by your NDT personnel and clients.

**The following consulting services are available:**

* Personnel qualification services
* Written practice development
* Method selection and implementation
* Inspection plan formulation
* Inspection project management
* Technical reporting
* Third party client representation
* Codes & specifications interpretation

# Course Descriptions

Below is a brief description followed by a detailed outline of each course offered by TKS.

## Acoustic Emission Level I

The Level I course is designed to introduce newcomers to acoustic emission testing. A general overview on the method is provided focusing on basic theory and applications. The student is introduced to acoustic emission data acquisition, sensor installation, advantages/limitations of the technique. The course meets SNT-TC-1A and CP-189 requirements.

## Acoustic Emission Level II

The Level II course instructs the student on all aspects of acoustic emission testing. The course addresses the basics of sensor operation, preamplifier function, cable options, analog-to-digital conversion, and inspection data interpretation. This course is a hands-on course that requires the student to set up and perform acoustic emission testing (download PDF). The course meets SNT-TC-1A and CP-189 requirements

## Mag Particle Testing Level I and II

A short course that discusses the principles of MT testing, advantages, and limitations. Practical training on real world specimens is provided (download PDF). A three-day course that covers the theoretical and practical aspects of this technique with practical exercises using industry standard equipment. The course meets SNT-TC-1A and CP-189 requirements.

## Liquid Penetrant Testing I and II

A short course that discusses the principles of PT testing, advantages, and limitations. Practical training on real world specimens is provided (download PDF). A two-day course that covers the theoretical and practical aspects of this technique with practical exercises using industry standard equipment. The course meets SNT-TC-1A and CP-189 requirements.

## Ultrasonic Testing Level I

A complete introductory course designed for staff with minimal background in ultrasonic testing. An in-depth introduction on topics ranging from ultrasonic theory to instrumentation is provided. Using our multi-media training tools we are able to clearly explain important ultrasonic nondestructive testing principles. Level I focuses most on straight beam inspection as well as ultrasonic thickness testing. Angle beam aspects are introduced towards the end of the course.

## Ultrasonic Testing Level II

Advanced Level II training focuses on materials, ultrasonic theories such as Snell’s Law, manufacturing processes, and ultrasonic inspection applications. Level II focuses primarily on angle beam testing with an emphasis on weld inspections. Some PAUT is introduced in this 40-hour course.

## Phased Array Ultrasound (PAUT)

* 1. This advanced course focuses on PAUT applications, principles of PAUT probes and sound fields, focal laws, beam steering, ray tracing, and weld inspection. This course is recommended for ASNT/ACCP Level 3, UT Level 2 weld inspectors and engineers or project managers seeking a greater understanding of PAUT.

Phased array ultrasound (PAUT) is an advanced NDT method that may be used for most conventional ultrasound applications. Due to the technology’s ability to focus and steer the ultrasound inside the part it is rapidly becoming the industry standard for critical weld inspection and small crack detection. PAUT may also be used in more conventional corrosion survey applications.

## Total Focus Method (TFM) / Full Matrix Capture (FMC)

* 1. This advanced course focuses on TFM/FMC wave sets, acoustic intensity maps, synthetic aperture focusing theory, and performance comparisons to PAUT probes and sound fields, focal laws, beam steering, ray tracing, and weld inspection. This course is recommended for ASNT/ACCP Level 3, UT Level 2, PAUT Level 2, weld inspectors and engineers or project managers seeking a greater understanding of PAUT.

## Flow Iron Recertification

This training course focusing on visual inspection of the flowline assemblies and components (internal & external) to identify any damages, flaws, defects or excessive wear, UT Thickness calibration and inspection procedure to verify wall thicknesses, magnetic particle testing to identify the presence of any surface defects in flowline assemblies, introduction to pressure testing on high-pressure frac iron components to their specified cold working pressure rating.

**4.10 Eddy Current Testing Level I**

This training course focuses on the fundamental principles of Eddy Current Testing surface scanning techniques including electromagnetic theory, conductivity measurement and how to detect second layer corrosion and near surface cracking. Eddy Current Testing allows for the inspection of conductive materials without needing to remove non-conductive coatings. The student will become proficient in lift-off measurements, flaw detection procedures and thickness evaluations and learn of the applications of different types of eddy current probes and test coil designs. This course meets SNT-TC-1A, NAS-410 and ANSI/ASNT CP-105 requirements.

**4.11 Eddy Current Testing Level II**

The Level II course continues where Level I left off and advances the student’s knowledge of test setup and data analysis. Student’s will interpret impedance plane data acquired using encircling coils, surface probes and inner diameter probes. Practical exercises will include bolt hole testing and inspecting cracks under fasteners using both ring and sliding probes. The Level II technician will be able to accurately assess which type of Eddy Current Testing is the most appropriate for a given task. This course meets SNT-TC-1A, NAS-410 and ANSI/ASNT CP-105 requirements.

**4.12 Time of Flight Diffraction Level II**

This advanced training course requires UT Level II certification or a minimum of 80 hours of conventional UT training and investigates the principles and theory of Time of Flight Diffraction. The student will learn how to prepare scan plans, become familiar with inspection software, perform TOFD inspection calibrations and optimizing PCS and angles. Procedures for the verification of flaw existence and position will be provided. The various features and designs of TOFD probes and wedges will be covered in addition to parallel and non-parallel scannings and multi-probe setups. Data interpretation of A- and B-scans will allow for flaw sizing and defect differentiation from geometric and include reporting procedures suitable for all relevant codes and standards. Lateral wave synchronization and removal in addition to other advanced digital processing features like SAFT, linearization, and filters will be introduced.

# 2024 Course Schedule

| **January**Jan 9-13 Phased Array IIJan 16-20 Phased Array IIJan 23-27 Flow/Frac Iron Recertification**February**Feb 6-10 TFM/FMCFeb 13-17 TFM/FMCFeb 20-24 Flow/Frac Iron RecertificationFeb 27- March 3 UT Level I **March**March 6- 10 UT Level II March 13- 17 Flow/Frac Iron RecertificationMarch 20- 24 Ultrasonic ThicknessMarch 27-31- 18 Magnetic Particle Testing**April**April 3- 7 Flow/Frac Iron Recertification April 10- 14 UT Level IApril 17 - 21 UT Level II**May** May 1 - 5 Liquid Penetrant TestingMay 8-12 Magnetic Particle TestingMay 15-19 Flow/Frac Iron RecertificationMay 22-26 TFM/FMCMay 29 – June 2 TFM/FMC**June**June 5-9 Phased Array IIJune 12-16 Flow/Frac Iron RecertificationJune 19-23 Ultrasonic ThicknessJune 26-30 Magnetic Particle Testing | **July**July 3-7 Flow Iron RecertificationJuly 10-14 Liquid Penetrant TestingJuly 17-21 Magnetic Particle TestingJuly 24-28 Phased Array II **August**August 7-11 Phased Array II August 14-18 TFM/FMCAugust 21-25 TFM/FMC**September**Sept 18-22 Flow/Frac Iron Recertification**October**Oct 2-3 MT Level II Oct 4-5 PT Level II Oct 5-6 UTT Level II **November**Nov 6-10 Phased Array II Nov 13-17 Phased Array II **December**Dec 4-8 Ultrasonic ThicknessDecember 11-15 Liquid Penetrant TestingDecember 18-22 Magnetic Particle Testing |
| --- | --- |



# **NDT Training Course Pricing**

| **Course** | **Cost** | **Length** |
| --- | --- | --- |
| Acoustic Emission Level I | $1950 | 40 hours |
| Acoustic Emission Level II | $1950 | 40 hours |
| Magnetic Particle Testing Level 2 | $1250 | 20 hours |
| Liquid Penetrant Testing Level 2 | $1250 | 12 hours |
| Ultrasonic Testing Level I | $1750 | 40 hours |
| Ultrasonic Testing Level II | $1750 | 40 hours |
| Ultrasonic Thickness Testing | $900 | 8 hours |
| Guided Wave Ultrasound Level II | $5000 | 40 hours |
| Phased Array Ultrasound  | $3500 | 80 hours |
| Total Focus Method / Full Matrix Capture | $3500 | 80 hours  |
| Flow Iron Recertification Training | $1750 | 30 hours |
| Eddy Current Level I |  | 40 hours |
| Eddy Current Level II |  | 40 hours |

# **NDT Training Course Terms**

Full payment must be received prior to attending the selected training course(s).

Please review and complete the Nondestructive Training Course Guidelines and Policy

Nondestructive training courses are designed and delivered to satisfy the guidelines set forth in The American Society for Nondestructive Testing’s (ASNT) Recommended Practice No. SNT-TC-1A (2011), CP-189 and ISO-9712.

Level 1 and 2 attendees are administered a General, Specific, and Practical Examination. A passing composite grade of at least 80 percent is required with no individual examination having a passing grade less than 70 percent.

Level 3 attendees are administered a General, Specific, Practical Exam, and Procedure Examination. A passing composite grade of at least 80 percent is required with no individual examination having a passing grade less than 70 percent.

Reexamination policy: In the event of a composite grade of less than 80%, or an individual test score of less than 70%, the candidate can retake the examination(s) on-line 2 weeks after the course completion date. The candidate will be supplied with a username and password to access the online examination. A $75 fee is charged by TechKnowServ Corp (TKS) to administer each exam and payment must be made prior to the taking the exam.

Attendees that complete the training course and successfully pass the exam as outlined above will be provided with a certificate that states the attendee’s name, the nondestructive testing method, level, course duration, course dates, course location, and is signed by the Level III course director. A separate cover letter will be provided to the attendee with a summary of test scores. Copies of the completed exams are not provided to attendees and will remain on file at TKS.

Nondestructive testing personnel certification is a process that involves Practical Experience, Classroom Training, and Examination. TKS nondestructive testing training courses are designed to satisfy the Classroom Training and Examination requirements for Employer based certification and to prepare the candidate for ASNT Central Certification (ACCP), and Recertification. As with all other NDT training courses, the NDT training course does not satisfy the Minimum Required Work Experience for certification.

**REFUND/CANCELLATION POLICY:** TKS must receive written notification of cancellation at least ten (10) business days prior to the first day of the course for a full refund minus any credit card transaction fees. If a trainee reschedules or cancels a program less than 10 business days before the class start date, only 50% of the course registration fee will be refunded. If TKS were to cancel a course, at least five days notice will be given and a full refund will be issued.