

COURSE OVERVIEW FE0770
Ultrasonic Testing Level I Training & Certification
(ASNT, SNT-TC-1A)

Course Title

Ultrasonic Testing Level I Training & Certification
(ASNT, SNT-TC-1A)

Course Date/Venue

May 05-09, 2024/Boardroom Meeting Room, M
Gallery Hotel Istanbul, Turkey

Course Reference

FE0770



Course Duration/Credits

Five days (40 hours)/4.0 CEUs/40 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art equipment.



This course is designed to provide participants the theory lectures and practical training with a preliminary understanding of Ultrasonic Testing (UT) as per the ASNT Recommended Practice No. SNT-TC-1A for Personnel Qualification and Certification in Non-destructive Testing.



Sample Questions for general examinations are presented in the separate question booklets that can be obtained from ASNT International Service Center. Participants will further demonstrate familiarity with and ability to operate the necessary equipment for UT, record and analyse the resultant information to the degree required as well as test flawed specimen and component and analyse the results of NDT as part of the practical training.

At the completion of the course, participants will be appearing for a Level I exam. Each candidate will be a 'Certified ASNT NDT Level I in Ultrasonic Testing' upon successfully passing the examination with a minimum passing composite grade of at least 80 percent (%).

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get certified as a “*Certified ASNT-NDT Level I in Ultrasonic Testing*”
- Perform specific calibrations, specific nondestructive testing (NDT) and specific evaluations properly for acceptance or rejection determinations according to written instructions and record results
- Test and apply ultrasonic energy as well as perform basic math review
- Recognize the responsibilities of levels of certification and identify the basic principles of acoustics
- Discuss basic pulse-echo instrumentation (A-scan, B-scan, C-scan and computerized systems) covering electronics, control functions and calibration including digital thickness instrumentation
- Perform transducer operation and explain transducer theory
- Explain the purpose and principles of couplants as well as identify the materials and their efficiency
- Demonstrate basic testing methods comprising of contact, immersion, air coupling and comparison of contact and immersion methods
- Carryout equipment standardization and inspection
- Implement straight-beam and angle-beam examination through specific procedures

Who Should Attend

This course provides an overview of all significant aspects and considerations of ultrasonic testing in accordance with the ASNT international standard for all engineers and other technical staff working in the field of welding technology and quality assurance of welded joints using ultrasonic testing and in order to investigate material with such technique.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during

Exam Eligibility & Structure

Exam Candidates shall have the following minimum pre-requisites:-

| Initial Training & Experience Levels | | | |
|--------------------------------------|----------------|----------------------------|--------------------|
| Level | Training Hours | Minimum Hours in UT Method | Total Hours in NDT |
| I | 40 | 210 | 400 |
| II | 40 | 630 | 1200 |

The experience shall consist of time at NDT Level I or equivalent. If a person is being qualified directly to NDT Level II with no time at NDT Level I, the experience (both Method and Total NDT) shall consist of the sum of the hours for NDT Level I and Level II and the training shall consist of the sum of the hours for NDT Level I and Level II.

Examinations Category & Criteria

Vision Examinations

- Near-Vision Acuity
 - This examination will ensure natural or corrected near-distance acuity in at least one eye such that the applicant is capable of reading a minimum of Jaeger Number 2 or equivalent type and size letter at the distance designated on the chart but not less than 12 inches (30.5 cm) or a standard Jaeger test chart. The ability to perceive an Ortho-Rater minimum of 8 or similar test pattern is also acceptable. This examination shall be administered annually.

- Color Contrast Differentiation
 - This examination will demonstrate the capability of distinguishing and differentiating contrast among colors or shades of gray used in the method as determined by the company. This shall be conducted upon initial certification and at five-year intervals thereafter

General (Written)

- This examination will address the basic principles of the applicable method
- The NDT Level III will provide appropriate questions covering the applicable method to the degree required by the company’s written practice
- The minimum number of examination questions that will be given is 40

Specific (Written)

- This examination will address the equipment, operating procedures and NDT techniques that the individual may encounter during specific assignments to the degree required by the company’s written practice
- The specific examination will also cover the specifications or codes and acceptance criteria used in the company’s NDT procedures
- The minimum number of examination questions that will be given is 20

Practical

- The candidate shall demonstrate familiarity with and ability to operate the necessary NDT equipment, record and analyse the resultant information to the degree required
- At least one flawed specimen or component shall be tested and the results of the NDT analysed by the candidate
- The description of the specimen, the NDT procedure including check points and the results of the examination shall be documented
- Proficiency shall be demonstrated in performing the applicable NDT technique on one or more specimens or machine problems approved by the NDT Level III and in evaluating the results to the degree of responsibility as described in the employer's written practice. At least ten (10) different checkpoints requiring an understanding of test variables and the employer's procedural requirements will be included. The candidate shall detect all discontinuities and conditions specified by the NDT Level III.

Note: While it is normal to score the practical on a percentile basis, practical examinations will contain check points that failure to successfully complete will result in failure of the examination

Additional Criteria

All written examinations will be closed-book except that necessary data such as graphs, tables, specifications, procedures, codes, etc., may be provided during the examination. All questions are approved by the responsible NDT Level III.

Course Fee

US\$ 6,500 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Qualification Certificate(s)

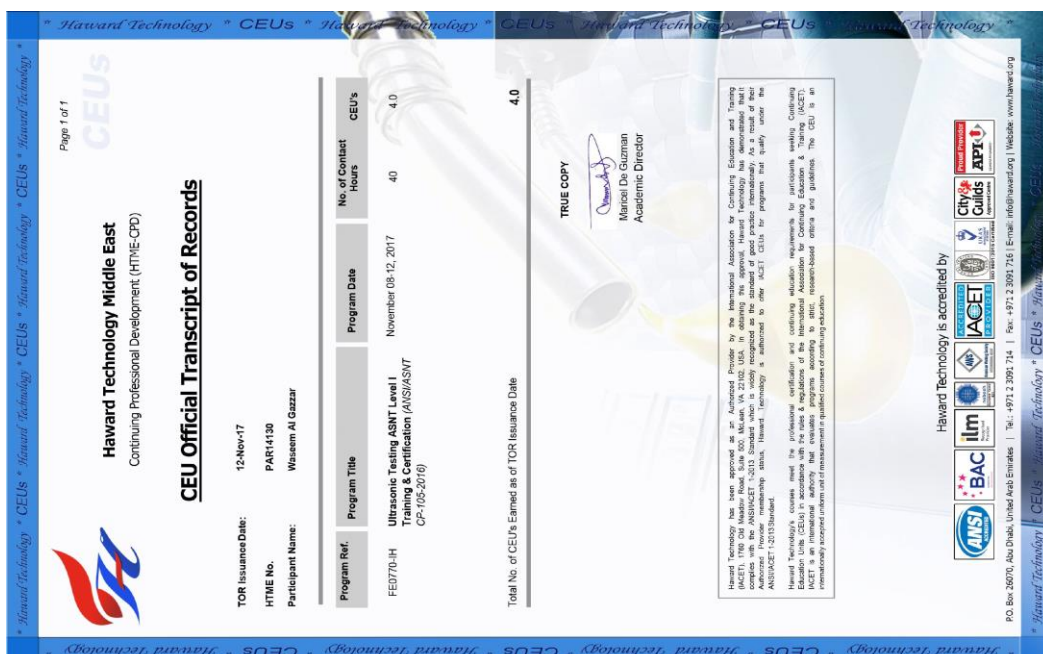
(1) Internationally recognized Qualification Certificates will be issued to participants who have successfully completed the course and passed the exam at the end of the course. Successful candidate will be certified as an “*Certified ASNT-NDT Level I in Ultrasonic Testing*”. Qualification Certificate is valid for 5 years.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-




(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.




Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

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The American Society for Nondestructive Testing (ASNT)

Haward Technology's instructors are certified by **The American Society for Nondestructive Testing (ASNT)** and are authorized to conduct ASNT's certification programs for specific NDT methods in accordance with ASNT-TC-1A (2016). ASNT is the world's largest technical society for nondestructive testing (NDT) that provides a forum for exchange of NDT technical information, NDT educational materials and programs, and standards and services for the qualification and certification of NDT personnel.


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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **4.0 CEUs** (Continuing Education Units) or **40 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council for Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Dr. Mohammed Elsaady, PhD, MSc, BSc, ASNT-NDT, is a **Senior NDT Weld Inspector** in **Ultrasonic Testing, Liquid Penetrant Testing and Radiographic Testing** with extensive years of experience within the **Oil, Gas, Refinery and Petrochemical** industries. His wide expertise includes in the areas of **ASNT-NDT Inspection & Testing, Welding & Metallurgy, Metallurgical Failure Analysis & Prevention, Welding Technology Testing & NDT Procedures, Non-Destructive Testing & Engineering**

Materials, NDT Methods & Application, Measuring Tools Calibration & Inspection Techniques, Welding & Fabrication, Welding Processes, Welding Inspection, Welding Procedure Specification, Welding Quality & Control, Welding Engineering, Welding & Machining, Welding Safety, Welding Defects Analysis, Welding Technology, Welding Inspection, Welding Defects Analysis, Welding Joints & Coating Inspection, Metal Technology, Heat Treatment, Steel Metallurgy, Valve Inspection & Repair, Pipe Testing, Piping System, Steel Structures, Metals Casting, Crane Functional Testing & Load Testing, Hydrotesting, Pressure Testing Procedure, Pressure Equipment Calibration, Calculation & Investigation of PWHT, SMAW, GMAW, FCAW, GTAW, Metallurgical & Materials Engineering, Material Selection & Failure Analysis, NDT Procedures, Isometric Drawing, Remedial Repair, Post Weld Heat Treatment, Hardness Testing, Welding Electrodes Monitoring & Control, Leak Testing, Vendor & Supplier Inspection, Third-party Inspection, Stream Inspection, Corrosion Evaluation, Casting Products Inspection and Raw Materials Inspection. He is currently the **Senior NDT Weld Inspector** of Petrojet wherein he is responsible in the inspection and testing of ASNT-NDT methods.

During his career life, Dr. Mohammed has gained his practical experience through his various significant positions and dedication as the **Senior NDT Weld Inspector, NDT Weld Inspector** and **Senior ASNT-NDT Instructor/Trainer** from Petrojet.

Dr. Mohammed has a **PhD, Master and Bachelor** degrees in **Metallurgical Engineering** and a **Diploma in Project Management**. Further, he is a **Certified Instructor/Trainer, a Certified ASNT-NDT Level III Inspector** in Ultrasonic Testing (UT), Liquid Penetrant Testing (PT) and Radiographic Testing (RT); a **Certified AWS-CWI Welding Inspector** and a **Certified Internal Auditor**. He has further delivered numerous trainings, courses, workshops, seminars and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 05th of May 2024

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|-------------|---|
| 0730 – 0800 | Registration & Coffee |
| 0800 – 0815 | Welcome & Introduction |
| 0815 – 0830 | PRE-TEST |
| 0830 – 0930 | Introduction Definition of Ultrasonics • History of Ultrasonic Testing • Applications of Ultrasonic Energy • Basic Math Review • Responsibilities of Levels of Certification |
| 0930 – 0945 | Break |
| 0945 – 1200 | Basic Principles of Acoustics Nature of Sound Waves • Modes of Sound-wave Generation • Velocity, Frequency & Wavelength of Sound Waves • Attenuation of Sound Waves • Acoustic Impedance • Reflection • Refraction & Mode Conversion • Snell's Law & Critical Angles • Fresnel & Fraunhofer Effects |
| 1200 – 1300 | Lunch |
| 1300 – 1500 | Equipment Basic Pulse-Echo Instrumentation (A-scan, B-scan, C-scan & computerized systems) • Digital Thickness Instrumentation • Transducer Operation & Theory • Couplants |
| 1500 – 1515 | Break |
| 1515 – 1650 | Basic Testing Methods Contact • Immersion • Air Coupling |
| 1650 – 1700 | Recap |
| 1700 | End of Day One |

Day 2: Monday, 06th of May 2024

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|-------------|---|
| 0730 – 0930 | Testing Methods: Contact Straight Beam • Angle Beam • Surface-Wave & Plate Waves |
| 0930 – 0945 | Break |
| 0945 – 1200 | Testing Methods: Contact (cont'd) Pulse-Echo Transmission • Multiple Transducer • Curved Surfaces (Flat Entry Surfaces, Cylindrical & Tubular Shapes) |
| 1200 – 1300 | Lunch |
| 1300 – 1500 | Testing Methods: Immersion Transducer in Water • Water Column, Wheels, etc • Submerged Test Part • Sound Beam Path - Transducer to Part |
| 1500 – 1515 | Break |
| 1515 – 1650 | Testing Methods: Immersion (cont'd) Focused Transducers • Curved Surfaces • Plate Waves • Pulse-echo & Through-transmission |
| 1650 – 1700 | Recap |
| 1700 | End of Day Two |

Day 3: Tuesday, 07th of May 2024

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| 0730 – 0930 | Testing Methods: Comparison of Contact & Immersion Methods |
| 0930 – 0945 | Break |
| 0945 – 1200 | Testing Methods: Comparison of Contact & Immersion Methods (cont'd) |
| 1200 – 1300 | Lunch |
| 1300 – 1500 | Calibration (Electronic & Functional): Equipment Monitor Displays (Amplitude, Sweep, etc.) • Recorders • Alarms |
| 1500 – 1515 | Break |
| 1515 – 1650 | Calibration (Electronic & Functional): Equipment (cont'd) Automatic & Semiautomatic Systems • Electronic Distance/Amplitude Correction • Transducers |
| 1650 – 1700 | Recap |
| 1700 | End of Day Three |

Day 4: Wednesday, 08th of May 2024

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| 0730 – 0930 | Calibration (Electronic & Functional): Standardization of Equipment Electronics Variable Effects • Transmission Accuracy |
| 0930 – 0945 | Break |
| 0945 – 1200 | Calibration (Electronic & Functional): Standardization of Equipment Electronics (cont'd) Standardization Requirements • Standardization Reflectors |
| 1200 – 1300 | Lunch |
| 1300 – 1500 | Calibration (Electronic & Functional): Inspection Standardization Comparison with Reference Blocks • Pulse-Echo Variables • Reference for Planned Tests (Straight Beam, Angle Beam, etc.) • Transmission Factors |
| 1500 – 1515 | Break |
| 1515 – 1650 | Calibration (Electronic & Functional): Inspection Calibration (cont'd) Transducer • Couplants • Materials |
| 1650 – 1700 | Recap |
| 1700 | End of Day Four |

Day 5: Thursday, 09th of May 2024

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| 0730 – 0830 | Straight-Beam Examination to Specific Procedures Selection of Parameters • Test Standards |
| 0830 – 0930 | Straight-Beam Examination to Specific Procedures (cont'd) Evaluation of Results • Test Reports |
| 0930 – 0945 | Break |
| 0945 – 1030 | Angle-Beam Examination to Specific Procedures Selection of Parameters • Test Standards |
| 1030 – 1115 | Angle-Beam Examination to Specific Procedures (cont'd) Evaluation of Results • Test Reports |
| 1115 – 1215 | Lunch |
| 1215 – 1415 | Theoretical Examination |
| 1415 – 1430 | Break |
| 1430 – 1530 | Theoretical Examination (cont'd) |
| 1530 – 1630 | Practical Examination |
| 1630 – 1645 | Course Conclusion |
| 1645 – 1700 | Presentation of Course Certificates |
| 1700 | End of Course |

Practical Sessions

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will carryout NDT inspection using our “Ultrasonic Testing (UT) Equipment” and our specifically designed flawed specimen test components.



Ultrasonic Testing (UT) Equipment



Ultrasonic Testing Package USM 36



Course Coordinator

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