COURSE OVERVIEW FE0725-7D
ASNT NDT Level I Certification Program (MT, PT and UT)
(ASNT SNT-TC-1A)

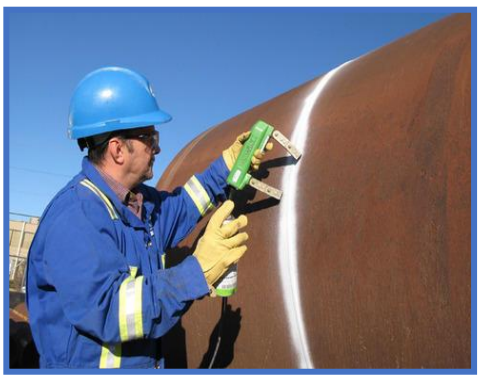
Course Title
ASNT NDT Level I Certification Program (MT, PT and UT) *(ASNT SNT-TC-1A)*

Course Date/Venue
May 04-12, 2025/Meeting Plus TBA, City Centre Rotana Doha, Doha, Qatar

Course Reference
FE0725-7D

Course Duration/Credits
Seven days/5.6 CEUs/56 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 developed by Haward Technology in order to provide participants with the theoretical and practical training in the subject and certify them as an "ASNT Level-I" in the following Non-Destructive Testing (NDT) methods:-

a) Magnetic Particle Testing (MT)
b) Liquid Penetrant Testing (PT)
c) Ultrasonic Testing (UT)

The course is developed in compliance with the requirements of the American National Standards Institute (ANSI) and The American Society for Non-destructive Testing (ASNT) based on the ANSI/ASNT CP-105 Standard for qualification of non-destructive testing personnel and as per the ASNT Recommended Practice No. SNT-TC-1A for Personnel Qualification and Certification in Non-destructive Testing together with the extra specific requirements.

This covers the principles of magnets and magnetic fields including its theory and the terminology associated with magnetic particle testing; the characteristics of magnetic fields and the effect of discontinuities of materials; and the magnetization in circular and longitudinal field by means of electric current and the proper method of magnetization.

Further, the course will also discuss the proper inspection of materials for wet particles and dry particles; the principles of demagnetization and magnetic particle testing equipment; the types of discontinuities detected by magnetic particle testing; the magnetic particle test indications and interpretations in a correct manner; the history of nondestructive testing as well as the purpose and basic principles of liquid penetrant testing; the various types of liquid penetrants commercially available and the method of personnel qualification; and the liquid penetrant processing including preparation of parts, adequate lightning, application of penetrant to parts, removal of surface penetrant, developer application and drying, inspection, evaluation and post cleaning.

Moreover, the course covers various types of penetrant testing methods based on the current ASTM and ASME standard methods particularly ASTM E 165, E 1208, E 1209, E 1210 and E 1417; the characteristics of each method and perform general applications of each method; penetrant testing equipment including its testing units, lighting and light meters, materials and precautions in liquid penetrant inspection; the proper testing and application of ultrasonic energy as well as basic math review; and the responsibilities of levels of certification and the basic principles of acoustics.

During this interactive course, participants will learn the basic pulse-echo instrumentation covering electronics, control functions and calibration including digital thickness instrumentation; transducer operation and transducer theory; the purpose and principles of couplants including materials and their efficiency; the basic testing methods comprising of contact, immersion, air coupling and comparison of contact and immersion methods; the equipment calibration and inspection; and the straight beam and angle beam examination through specific procedures.

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 MT, PT and 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 II exam. Each candidate will be a “Certified ASNT NDT Level-I in MT, PT & UT” upon successfully passing the examination with a minimum passing composite grade of at least 80 percent (%) which will be administered and graded by Haward Technology through its Certified ASNT Level-III instructors.

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 Magnetic Particle Testing (MT), Liquid Penetrant Testing (PT) and Ultrasonic Testing (UT)*
- Discuss the principles of magnets and magnetic fields including its theory and the terminology associated with magnetic particle testing
- Describe the characteristics of magnetic fields and identify the effect of discontinuities of materials
- Explain magnetization in circular and longitudinal field by means of electric current and select the proper method of magnetization
- Employ proper inspection of materials for wet particles and dry particles

- Recognize the principles of demagnetization and magnetic particle testing equipment
- Enumerate the types of discontinuities detected by magnetic particle testing
- Carryout magnetic particle test indications and interpretations in a correct manner
- Discuss the history of nondestructive testing as well as the purpose and basic principles of liquid penetrant testing
- Identify the various types of liquid penetrants commercially available and the method of personnel qualification
- Employ liquid penetrant processing including preparation of parts, adequate lightning, application of penetrant to parts, removal of surface penetrant, developer application and drying, inspection, evaluation and post cleaning
- Carryout various types of penetrant testing methods based on the current ASTM and ASME standard methods particularly ASTM E 165, E 1208, E 1209, E 1210 and E 1417
- Describe the characteristics of each method and perform general applications of each method
- Recognize penetrant testing equipment including its testing units, lighting and light meters, materials and precautions in liquid penetrant inspection
- 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 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 calibration and inspection
- Implement straight beam and angle beam examination through specific procedures

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of non-destructive 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, magnetic particle testing and liquid penetrant testing and in order to investigate material with such technique.

Exam Eligibility & Structure

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

MT Initial Training & Experience Levels			
Level	**Training Hours**	**Minimum Hours in Method**	**Total Hours in NDT**
I	12	70	130
II	8	210	400

PT Initial Training & Experience Levels			
Level	**Training Hours**	**Minimum Hours in Method**	**Total Hours in NDT**
I	4	70	130
II	8	140	270

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

A person may be qualified directly to NDT Level II with no time as a certified NDT Level I, providing the recommended training and experience consist of the sum of the hours recommended for NDT Level I and Level II.

Examinations Category & Criteria

Vision Examinations

- Near-Vision b Acuity
    - This examination will ensure natural or corrected (no pharmacological agents) 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.
    - Pharmacological agents (eye drops) that would improve or enhance visual acuity at any distance shall not be used
- 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 employer. This shall be conducted upon initial certification and at five-year intervals thereafter.
    - Vision examinations expire on the last day of the month of expiration

General (Written)

- This examination will address the basic principles of the applicable method
- The NDT Level III will select or devise appropriate questions covering the applicable method and techniques described by the employer's written practice and the applicable elements of the outline in ANSI/ANT CP-105
- The minimum number of examination questions that will be given is 40

- A valid ACCP, ASNT NDT or ASNT 9712 Level II certificate may be accepted as fulfilling the General examination criteria for each applicable method if the NDT Level III has determined that the ASNT examinations meet the requirements of the employer's written practice. This acceptance should be documented

Specific (Written)

- This examination will address the equipment, operating procedures and NDT techniques that the individual may encounter during specific assignments described by the employer's written practice and the applicable elements of the outline in ANSI/ASNT CP 105
- The specific examination will also cover the specifications or codes and acceptance criteria used in the NDT conducted by the employer
- 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
    - Phased Array Ultrasonic Testing and Time of Flight Diffraction Practical Examination. Flawed samples used for practical examinations should be representative of the components and/or configurations that the candidates would be testing under this technique and approved by the NDT Level III
    - Film Interpretation Limited Certification. The Practical examination should consist of review and grading of a sufficient number of radiographs to demonstrate satisfactory performance to the satisfaction of the NDT Level III. The number of radiographs should be addressed in the employer's written practice
- The description of the specimen, the NDT procedure including checkpoints and the results of the examination shall be documented
- Specimens. Proficiency shall be demonstrated in performing the applicable NDT technique on one or more flawed specimens as appropriate for the method and approved and documented by the NDT Level III (Grading Key)
- Evaluation. The candidate should evaluate the results to the degree of responsibility as described in the employer's written practice. The candidate should detect all discontinuities and conditions specified and documented by the NDT Level III. The written practice should address the acceptable detection rate as well as the maximum number of falls calls acceptable
- Grading. A checklist containing at least ten (10) different checkpoints requiring an understanding of test variables and the employer's procedural requirements will be included. While it is normal to score the Practical on a percentile basis *(80% required)*, the practical examination checklist should also contain a single checkpoint or multiple checkpoints that failure to successfully complete will result in failure of the examination. This requirement should be clearly marked on the checkpoint(s)

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.

Magnetic Particle Testing 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 a *"Certified ASNT NDT Level I in Magnetic Particle 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:-

Qualification Certificate

Haward Technology Middle East

الشركة السعودية للكهرباء
Saudi Electricity Company

This is to certify that

Ahmed Al-Hajri

has met the established & published Requirements for Certification by ASNT in accordance with SNT-TC-1A (2020) and the company's Written Practice as

ASNT NDT Level I

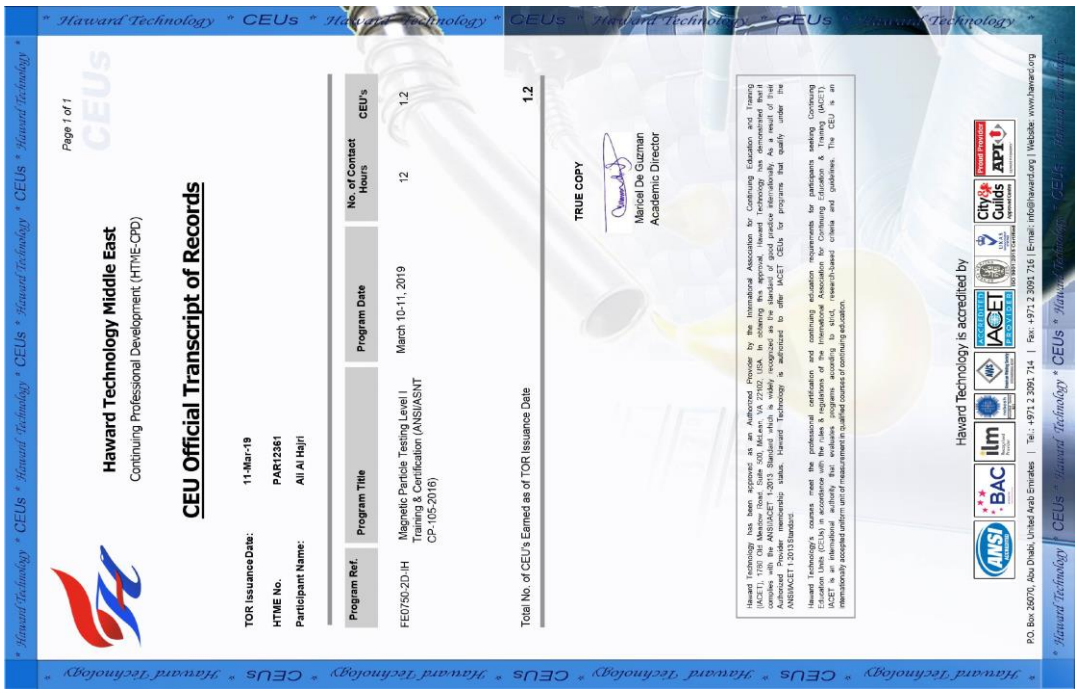
in the following Nondestructive Testing Methods:

Method	Product Form	Certificate No.	Issue Date	Expiry Date
Magnetic Particle Testing	All Forms	74851/01/FE0750-2D/DIA/14.10.22	10/22	10/27

ASNT Level III Examiner
Mr. Luis Lopez (ASNT# 219655)
Signature & Stamp:

Mr. Jaryl Castillo
Academic Director

(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.



Haward Technology * CEUs *

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Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 11-Mar-19
HTME No. PAR12361
Participant Name: Ali Al Hajri

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
FE0750-2D-IH	Magnetic Particle Testing Level I Training & Certification (ANSI/ASNT CP-105-2016)	March 10-11, 2019	12	1.2
Total No. of CEU's Earned as of TOR Issuance Date				1.2

TRUE COPY

Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 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 Association for Continuing Education & Training (IACET). As an IACET Authorized Provider, the Haward Technology is qualified to issue IACET CEUs for its programs that qualify under the ANSI/IACET 1-2013 Standard. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by

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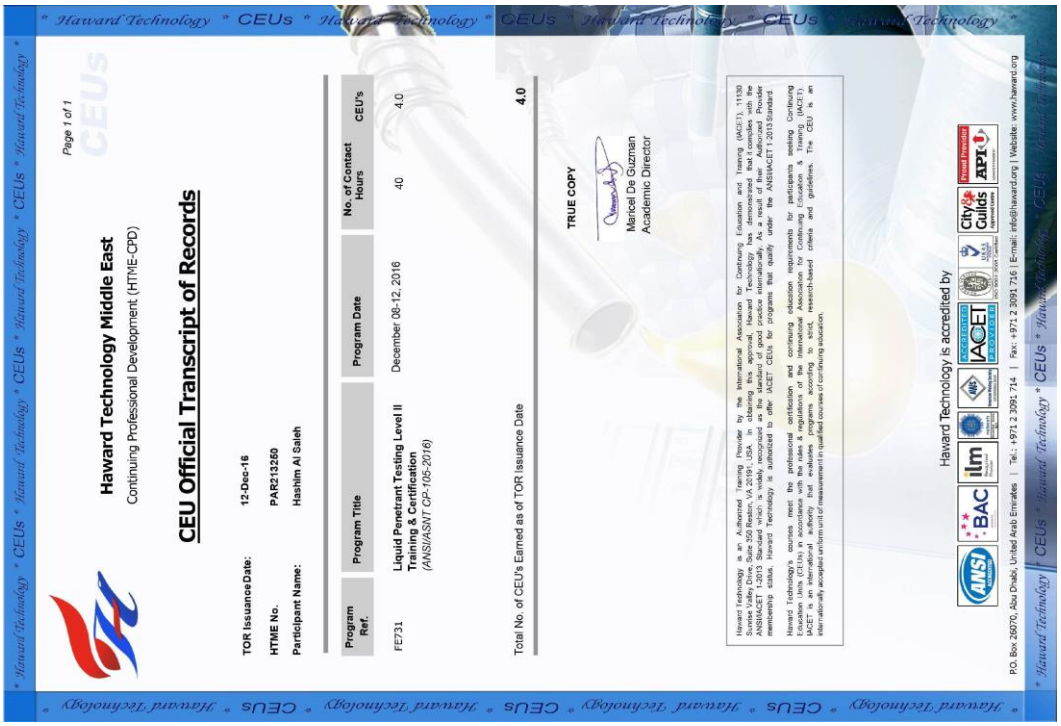
Liquid Penetrant Testing Qualification Certificate(s)

(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 a *"Certified ASNT NDT Level I in Liquid Penetrant 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.

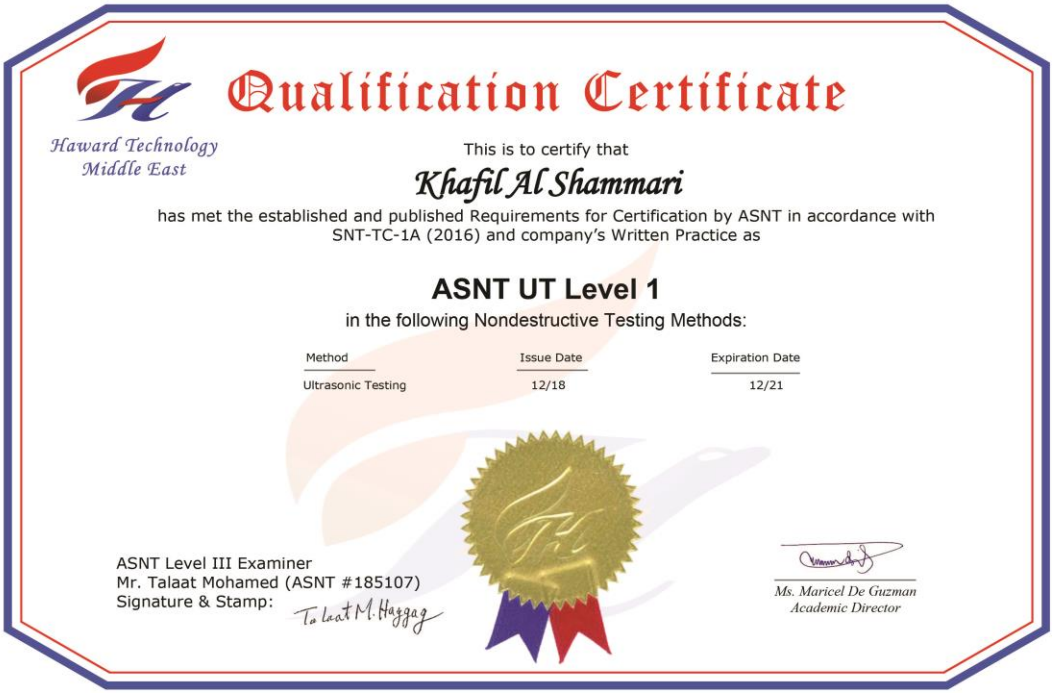


Ultrasonic Testing Qualification Certificate(s)

(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 a *"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:-



Qualification Certificate

Haward Technology Middle East

This is to certify that

Khafil Al Shammari

has met the established and published Requirements for Certification by ASNT in accordance with SNT-TC-1A (2016) and company's Written Practice as

ASNT UT Level 1

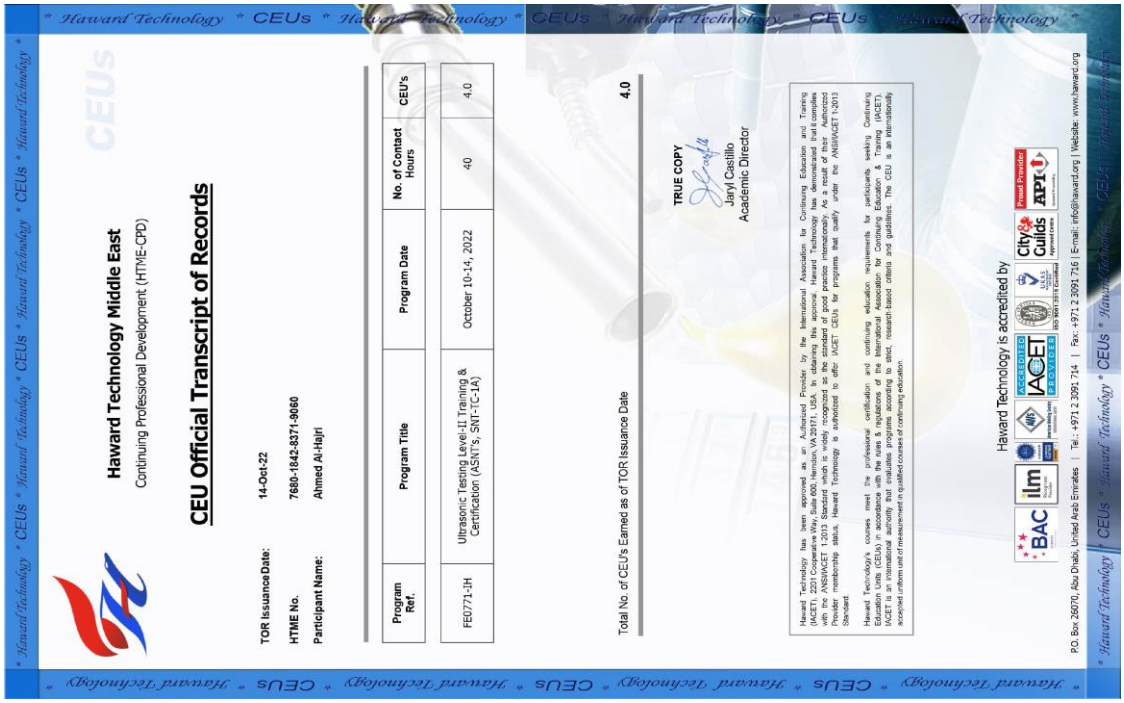
in the following Nondestructive Testing Methods:

Method	Issue Date	Expiration Date
Ultrasonic Testing	12/18	12/21

ASNT Level III Examiner
Mr. Talaat Mohamed (ASNT #185107)
Signature & Stamp:

Ms. Maricel De Guzman
Academic Director

(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.



Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Oct-22
HTME No. 7680-1842-8371-9060
Participant Name: Ahmed Al-Hajri

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
FE0771-IH	Ultrasonic Testing Level-II Training & Certification (ASNT's, SNT-TC-1A)	October 10-14, 2022	40	4.0

Total No. of CEU's Earned as of TOR Issuance Date 4.0

TRUE COPY
Jaryl Castillo
Academic Director

Haward Technology is accredited by

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the standards of the International Association 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.

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Course Accreditations

Haward Technology is accredited by the following international accreditation organizations:-

- 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.

- 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.

- 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 **5.6 CEUs** (Continuing Education Units) or **56 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.

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:

Mr. Saed Barakat (**ASNT ID# 187859**), BSc, ASNT-NDT, is a **Senior NDT Weld Inspector** in **Ultrasonic** Testing, **Radiographic** Testing, **Magnetic Particle** Testing, **Electromagnetic** Testing and **Liquid Penetrant** Testing with over **25 years** of experience within the **Oil & Gas**, **Petrochemical** and **Refinery** industries. His wide expertise includes in the areas of **ASNT-NDT** Inspection & Testing, **Welding Inspection** Technology, **NDT** Methods & Applications, **Conventional NDT & Advanced NDT**, Surface Method Testing (**MT&PT**), **Fabrication** of **NDT Test** Pieces, **Thermography**, **Thermal Infrared** Testing, **Radiographic Film** Interpretation, **Visual** Testing, **Phased Array Ultrasonic** Testing, **Long Ranged Ultrasonic** Testing, **Hydrostatic Leak** Testing, **Eddy Current** Testing, **Valve Inspection & Testing**, Codes & Standards Interpretation, **Corrosion** Engineering, **Corrosion & Metallurgy**, **Welding & Corrosion** Engineering, **Corrosion** Evaluation, **Corrosion in Fertilizer Plants**, **Welding** Metrology, International Welding Codes, Practical **Welding** Technology, Plastic Pipe Welding, **Welding** Inspection, **Welding** Defects Analysis, **Welding** Joints & Coating Inspection, Post Weld Heat Treatment, Hardness Testing, **Welding** Electrodes Monitoring & Control, **Pipe** Testing, **Piping** System, **Steel** Structures, Metals Casting, Crane Functional Testing & Load Testing, **Hydrotesting**, **Pressure Testing** Procedure, Stream Inspection, **Casting** Products Inspection, Raw Materials Inspection, **Ultrasonic Flaw Detector** Calibration, Operation & Testing, **Pressure Equipment** Calibration, **Calibration & Standardization of Equipment** Electronics and **Calibration & Testing Labs** in accordance with **ISO 17025** standard. He is also well-versed in **Radiation Safety & Protection**, Road Crossing, ICDL, Leadership Management, Train the Trainer, **Primavera**, **Six Sigma**, **Project Management**, **Construction Contracts** Management, **Performance Management** System, Total Quality Management (**TQM**), Quality Management System (**QMS**), **Self & Stress** Management and **Laboratory** Management, **Time** Management and Presentation Skills. He is currently the **Regional & Operations Manager** of National Inspection Technical Testing wherein he is deeply involved in **NDT** qualification and certification of personnel.

During his career life, Mr. Saed gained his practical and field experience through his various significant positions and dedication as the **Regional Manager**, **Operations Manager**, **Advance NDT Manager, General Manager**, **QA/QC Manager**, **QA/QC & Testing Laboratory Manager**, **Center Director** (Non-Destructive Laboratories), **Division Head** (Non-Destructive Testing & Radiation Protection), **Unit Head** (Non-Destructive Testing), **Laboratory Supervisor** (Non-Destructive Testing), **NDT Supervisor**, **NDT Engineer**, **Team Leader**, **National NDT Coordinator**, **NDT Course Director & Examiner**, **Technical Auditor**, **Senior Instructor/Trainer**, **Lecturer** for various international companies such as the ARAMCO, SABIC, Tasnee, Luberef, SEC, SWCC, Gulf Equipment Metrology Services, National Inspection & Technical Testing Co. (FAHSS/TÜV NORD), Brotherhood Technical Services Co., MID Contracting Co., Industrial Refrigeration Company (Coolex), Royal Scientific Society, just to name a few.

Mr. Saed has a **Bachelor's** degree in **Mechanical Engineering** (**Thermal Power**). Further, he is a **Certified Instructor/Trainer**, a **Certified ASNT-NDT Level III Inspector** in Ultrasonic Testing (**UT**), Radiographic Testing (**RT**), Magnetic Particle Testing (**MT**), Electromagnetic Testing (**ET**) and Liquid Penetrant Testing (**PT**). He has published several books and delivered numerous trainings, courses, workshops, seminars and conferences internationally.

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 the course for technical reasons.

Course Fee

US$ 8,500 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), 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.

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: Magnetic Particle Testing: Sunday, 04th of May 2025

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0845	***PRE-TEST***
0845 – 0930	***Principles of Magnets & Magnetic Fields*** *Theory of Magnetic Fields • Theory of Magnetism • Terminology Associated with Magnetic Particle Testing*
0930 – 0945	*Break*
0945 – 1015	***Characteristics of Magnetic Fields*** *Bar Magnet • Ring Magnet*
1015 – 1045	***Effect of Discontinuities of Materials*** *Surface Cracks • Scratches • Subsurface Defects*
1045 – 1115	***Magnetization by Means of Electric Current*** *Circular Field • Longitudinal Field*
1115 – 1200	***Selecting the Proper Method of Magnetization*** *Alloy, Shape & Condition of Part • Type of Magnetizing Current • Direction of Magnetic Field • Sequence of Operations • Value of Flux Density*
1200 – 1230	***Inspection Materials*** *Wet Particles • Dry Particles*
1230 – 1330	*Lunch*
1330 – 1415	***Principles of Demagnetization*** *Residual Magnetism • Reasons for Requiring Demagnetization • Longitudinal & Circular Residual Fields • Basic Principles of Demagnetization • Retentivity and Coercive Force • Methods of Demagnetization*

1415 – 1500	***Magnetic Particle Testing Equipment*** *Equipment Selection Considerations • Manual Inspection Equipment • Medium- & Heavy-Duty Equipment • Stationary Equipment • Mechanized Inspection Equipment*
1500 – 1515	*Break*
1515 – 1600	***Types of Discontinuities Detected by Magnetic Particle Testing*** *Inclusions • Blowholes • Porosity • Flakes • Cracks • Pipes • Laminations • Laps • Forging Bursts • Voids*
1600 – 1650	***Magnetic Particle Test Indications & Interpretations*** *Indications of Nonmetallic Inclusions • Indications of Surface Seams • Indications of Cracks • Indications of Laminations • Indications of Laps • Indications of Burst and Flakes • Indications of Porosity • Nonrelevant Indications*
1650 – 1700	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day One*

Day 2: Magnetic Particle Testing: Monday, 05th of May 2025

0730 – 0930	***Theoretical Examination***
0930 – 0945	*Break*
0945 – 1045	***Theoretical Examination (cont'd)***
1045 – 1115	***Practical Examination***

Day 2: Liquid Penetrant Testing: Monday, 05th of May 2025

1115 – 1130	***Introduction*** *Brief History of Nondestructive Testing &Liquid Penetrant Testing • Purpose of Liquid Penetrant Testing • Basic Principles of Liquid Penetrant Testing • Types of Liquid Penetrants Commercially Available • Method of Personnel Qualification*
1130 – 1145	***Liquid Penetrant Processing*** *Preparation of Parts • Adequate Lightning • Application of Penetrant to Parts • Removal of Surface Penetrant • Developer Application &Drying • Inspection & Evaluation • Postcleaning*
1145 – 1200	***Various Penetrant Testing Methods*** *Current ASTM &ASME Standard Methods – ASTM E 165, E 1208, E 1209, E 1210 & E 1417 • Characteristics of Each Method • General Applications of Each Method*
1200 – 1300	*Lunch*
1300 – 1315	***Liquid Penetrant Testing Equipment*** *Liquid Penetrant Testing Units • Lightning for Liquid Penetrant Testing Equipment & Light Meters • Materials for Liquid Penetrant Testing • Precautions in Liquid Penetrant Inspection*

1315 – 1500	***Theoretical Examination***
1500 – 1515	*Break*
1515 – 1630	***Theoretical Examination (cont'd)***
1630 – 1650	***Practical Examination***
1650 – 1700	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day Two*

Day 3: Ultrasonic Testing: Tuesday, 06th of May 2025

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*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day Three*

Day 4: Ultrasonic Testing: Wednesday, 07th of May 2025

0730 – 0930	***Testing Methods: Contact*** *Straight Beam ● Angle Beam ● Surface-Wave & Plate Waves*
0930 – 0945	*Break*
0945 – 1200	***Testing Methods: Contact (cont'd)*** *Pules-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*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day Four*

Day 5: Ultrasonic Testing: Thursday, 08th of May 2025

0730 – 0930	***Testing Methods: Comparison of Contract & Immersion Methods***
0930 – 0945	*Break*
0945 – 1200	***Testing Methods: Comparison of Contract & 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*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day Five*

Day 6: Ultrasonic Testing: Sunday, 11th of May 2025

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*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1700	*End of Day Six*

Day 7: Ultrasonic Testing: Monday, 12th of May 2025

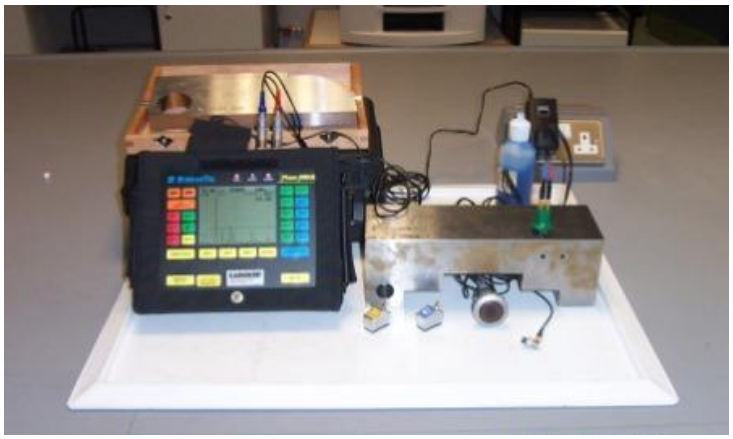
0730 – 0930	***Straight-Beam Examination to Specific Procedures*** *Selection of Parameters ● Test Standards ● Evaluation of Results ● Test Reports*
0930 – 0945	*Break*
0945 – 1100	***Angle-Beam Examination to Specific Procedures*** *Selection of Parameters ● Test Standards ● Evaluation of Results ● Test Reports*
1100 – 1115	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1115 – 1200	***Theoretical Examination***
1200 – 1300	*Lunch*
1300 – 1515	***Theoretical Examination (cont'd)***
1515 – 1530	*Break*
1530 – 1600	***Practical Examination***
1645 – 1700	*Presentation of Course Certificates*
1700	*End of Course*

Practical Sessions

Practical sessions which client shall provide will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout NDT inspection using the "Magnetic Particle Testing (MT) Equipment", "Liquid Penetrant Testing (PT) Equipment, "Ultrasonic Testing (UT) Equipment", and our specifically designed flawed specimen test components.

Magnetic Particle Testing (MT) Equipment

Liquid Penetrant Testing (PT) Equipment



Ultrasonic Testing (UT) Equipment

Ultrasonic Testing Package USM 36

Flawed Specimen Test Components

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