COURSE OVERVIEW FE0750-2D

Magnetic Particle Testing Level I Training & Certification

(ASNT's SNT-TC-1A)

Course Title

Magnetic Particle Testing Level I Training & Certification *(ASNT's SNT-TC-1A)*

Course Date/Venue

September 09-10, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

FE0750-2D

Course Duration/Credits

Course: Twelve hours/1.2 CEUs/12 PDHs
Exam: half day
Total: Two days

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.

The course will provide participants the theory lectures and practical training with a preliminary understanding of Magnetic Particle Testing (MT) as per the ASNT Recommended Practice No. SNT-TC-1A for Personnel Qualification and Certification in Nondestructive Testing.

Magnetic Particle Testing (MT) is one of the most widely used Nondestructive Tests. It is a quick and effective test for the detection of discontinuities at or very close to the surface of the object being examined. As with PT, MT is usually performed in addition to a volumetric NDT. It is limited to those materials that can be effectively magnetized. Fine ferromagnetic particles are applied to the surface of the magnetized parts and align themselves in areas of magnetic flux leakage indicating the presence of discontinuities.

The course participants will learn the principles of magnetism as it relates to the detection of flaws in ferromagnetic materials. There are a number of techniques that make MT suitable for a wide range parts with various shapes and sizes. MT can be performed with portable equipment or stationary systems.

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, 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 Magnetic Particle 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 Level I in Magnetic Particle Testing"*
- Perform specific calibrations, specific nondestructive testing (NDT) and specific evaluations properly for acceptance or rejection determinations according to written instructions and record results
- 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

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of magnetic particle 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 magnetic particle 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 the course for technical reasons.

Exam Eligibility & Structure

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

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

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 employer. 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 employer'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 employer's written practice
- The specific examination will also cover the specifications or codes and acceptance criteria used in the employer'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 Liquid Penetrant Testing 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$ 3,000 per Delegate + **VAT**. 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.

Qualification Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully 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

Certificate No. 01/PT/2019

Ali Al Hajri

NPCC

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

ASNT NDT Level I

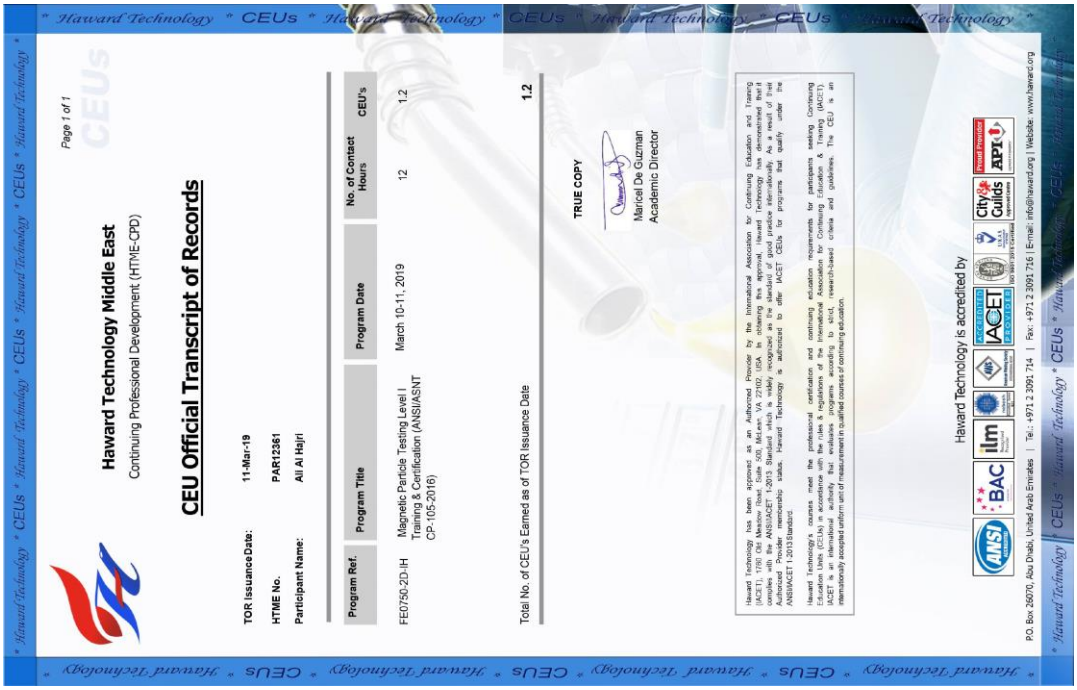
in the following Nondestructive Testing Methods:

Method	Product Form	Issue Date	Expiry Date
Magnetic Particle Testing	All Form	03/19	03/24

ASNT Level III Examiner
Mr. Mohamed Hosny (ASNT# 153072)
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.



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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 2018-1 Standard which is recognized worldwide for the quality assurance of continuing education and training. As an Authorized Provider, 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). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted unit of measurement for qualified courses of continuing education.

Haward Technology is accredited by

Haward Technology * CEUs * Haward Technology * CEUs * Haward Technology * CEUs * Haward Technology

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | Fax: +971 2 3091 716 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Certificates are 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.

- 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 **1.2 CEUs** (Continuing Education Units) or **12 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.

- 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:

Mr. Luis Lopez is a **Senior Inspection Engineer** with extensive experience within the **Oil & Gas**, **Petrochemical** and **Refinery** industries. His expertise widely covers in the areas of **Thermography**, **Thermal Infrared** Testing, **Radiographic Film** Interpretation, **Visual** Testing, **Phased Array Ultrasonic** Testing, **Ultrasonic** Testing, **Magnetic Particle** Testing, **Liquid Penetrant** Testing, **Non-destructive Testing**, **NDT** Methods & Applications, **Electromagnetic** Testing, **Hydrostatic Leak** Testing, **Eddy Current** Testing, **Valve Inspection & Testing**, Codes & Standards Interpretation, **Corrosion** Engineering, **Corrosion & Metallurgy**, **Welding & Corrosion** Engineering, **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, **Pressure Equipment** Calibration, Stream Inspection, **Corrosion** Evaluation, **Casting** Products Inspection and Raw Materials Inspection. He is currently the **Senior NDT Instructor** of **SETE** wherein he is deeply involved in thermography, NDT qualification and certification of personnel.

During his career life, Mr. Lopez gained his practical and field experience through his various significant positions and dedication as the **Technical Manager**, **NDT Instructor**, **NDT Manager & Instructor**, **NDT Inspector**, **NDT Offshore Inspector & Quality Control**, **Phased Array Ultrasonic Technician** and **Radiographic Testing Technician** for various international companies such as the JP Inspections, Nova Inspection, NSD Services, Cotemar, UNISPEC Inspection and Ruiver.

Mr. Lopez holds a **Diploma** in **Professional Mechanical & Electrical Technician**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management** (**ILM**), a **Certified ASNT-NDT Level III Inspector** in Infrared & Thermal Testing (**IR**), Liquid Penetrant Testing (**PT**), Magnetic Particle Testing (**MT**), Ultrasonic Testing (**UT**), Visual Testing (**VT**), Radiography Testing (**RT**), Leak Testing (**LT**), Electromagnetic Testing (**ET**), Certified Welding Inspection & Metallurgy Professional (**API 577**) and a **Certified AWS-CWI Welding Inspector**. 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: ***Monday, 09th of September 2024***

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 – 1045	***Characteristics of Magnetic Fields*** *Bar Magnet • Ring Magnet*
1045 – 1145	***Effect of Discontinuities of Materials*** *Surface Cracks • Scratches • Subsurface Defects*
1145 – 1245	*Lunch*
1245 – 1345	***Magnetization by Means of Electric Current*** *Circular Field • Longitudinal Field*
1345 – 1445	***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*
1445 – 1530	***Inspection Materials*** *Wet Particles • Dry Particles*
1530 – 1545	*Break*
1545 – 1650	***Principles of Demagnetization*** *Residual Magnetism • Reasons for Requiring Demagnetization • Longitudinal & Circular Residual Fields • Basic Principles of Demagnetization • Retentivity and Coercive Force • Methods of Demagnetization*
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: ***Tuesday, 10th of September 2024***

0730 – 0930	***Magnetic Particle Testing Equipment*** *Equipment Selection Considerations • Manual Inspection Equipment • Medium- & Heavy-Duty Equipment • Stationary Equipment • Mechanized Inspection Equipment*
0930 – 0945	*Break*
0945 – 1030	***Types of Discontinuities Detected by Magnetic Particle Testing*** *Inclusions • Blowholes • Porosity • Flakes • Cracks • Pipes • Laminations • Laps • Forging Bursts • Voids*
1030 – 1145	***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*

1145 – 1200	***Theoretical Examination***
1200 – 1300	*Lunch*
1300 – 1545	***Theoretical Examination (cont'd)***
1545 – 1600	*Break*
1600 – 1630	***Practical Examination***
1630 – 1645	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
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 be provided with an opportunity to carryout welding inspection using the "American Welding Society (AWS) Tool Kit" and "Structural Weld Replica Kit" and magnetic testing and calibration using the "Magnetic Yoke Testing Kit" suitable for classroom training.

AWS Tool Kit

Structural Weld Replica Kit

Magnetic Yoke Testing Kit

Course Coordinator
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