COURSE OVERVIEW FE0751-2D

Magnetic Particle Testing Level II Training & Certification

(ASNT, SNT-TC-1A)

Course Title

Magnetic Particle Testing Level II Training & Certification *(ASNT, SNT-TC-1A)*

Course Date/Venue

November 11-12, 2024/Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference

FE0751-2D

Course Duration/Credits

Two days (08 hours)/0.8 CEUs/08 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 Magnetic Particle Testing (MT) as per the ASNT Recommended Practice No. SNT-TC-1A for Personnel Qualification and Certification in Nondestructive Testing.

The course is designed to provide delegates with a detailed and up-to-date overview on magnetic particle testing. It covers the principles and theory of magnetic particle testing; magnets and magnetism; direct current, direct pulsating current and alternating current of flux fields; the effects of discontinuities on materials including design factors and the relationship to load-carrying ability; and magnetization by means of electric current using circular techniques and longitudinal technique.

Participants will be able to select the proper methods of magnetization; apply demagnetization procedures; and list the various types of equipment such as portable, stationary, automatic, multidirectional units, liquids and powders, ultraviolet radiation type and light-sensitive instruments.

Further, participants will be able to assess the types of discontinuities in casting, ingots, wrought sections, parts and welds; and implement systematic evaluation techniques using various standards and defect appraisal as well as quality control of equipment and processes.

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 II exam. Each candidate will be a '*Certified ASNT NDT Level II in Magnetic Particle Testing'* 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 II in Magnetic Particle Testing"*
- Discuss the principles and theory of magnetic particle testing including magnets and magnetism
- Recognize flux fields covering direct current, direct pulsating current and alternating current
- Identify the effects of discontinuities on materials including design factors and the relationship to load-carrying ability
- Explain magnetization in circular and longitudinal field by means of electric current and select the proper method of magnetization
- Employ demagnetization procedures by identifying the need for demagnetization of parts, and the need for collapsing flux fields as well as describing the current, frequency, field orientation and heat factors and precautions
- List the various types of equipment consisting of portable, stationary, automatic, multidirectional units, liquids and powders, ultraviolet radiation and light-sensitive instruments
- Enumerate the types of discontinuities in casting, ingots, wrought sections, parts and in welds
- Implement systematic evaluation techniques using various standards and appraising the defect
- Carryout strategic quality control of equipment and processes

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 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.

Exam Eligibility & Structure

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

All Participants of this course must have Level-I in MT before they can attend this Level-II course.

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

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 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 selecting and performing the applicable NDT technique within the method and in interpreting and evaluating the results on one or more specimens or machine problems approved by the NDT Level III. At least ten (10) different checkpoints requiring an understanding of NDT 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 shall 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.

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 II 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 II

in the following Nondestructive Testing Methods:

Method	Product Form	Certificate No.	Issue Date	Expiry Date
Magnetic Particle Testing	All Forms	74851/01/FE0751/DMM/14.10.22	10/22	10/27

ASNT Level III Examiner
Mr. Gert Viljoen (ASNT# 219656)
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 Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Oct-22
HTME No. 74851
Participant Name: Ahmed Al-Hajri

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
FE0751	Magnetic Particle Testing Level II Training & Certification *(ASNT, SNT-TC-1A)*	October 13-14, 2022	08	0.8

Total No. of CEU's Earned as of TOR Issuance Date: 0.8

TRUE COPY
Jaryl Castillo
Academic Director

Haward Technology is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | 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 has certain instructors who are certified by **The American Society for Nondestructive Testing** (**ASNT**) and are authorized to conduct ASNT's certification programs for specific NDT methods. 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 **0.8 CEUs** (Continuing Education Units) or **08 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.

Accommodation

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

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$ 2,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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, 11th of November 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 - 0900	***Principles*** *Theory ● Magnets & Magnetism*
0900 - 0930	***Flux Fields*** *Direct Current ● Direct Pulsating Current ● Alternating Current*
0930 - 0945	*Break*
0945 – 1030	***Effects of Discontinuities on Materials*** *Design Factors ● Relationship to Load-Carrying Ability*
1030 – 1130	***Magnetization by Means of Electric Current*** *Circular Techniques ● Longitudinal Technique*
1130 - 1230	***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*
1230 - 1245	*Break*
1245 – 1345	***Demagnetization Procedures*** *Need for Demagnetization of Parts ● Current, Frequency & Field Orientation ● Heat Factors & Precautions ● Need for Collapsing Flux Fields*
1345 - 1420	***Equipment*** *Portable Type ● Stationary Type ● Automatic Type ● Multidirectional Units ● Liquids & Powders ● Ultraviolet Radiation Type ● Light-Sensitive Instruments*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2:	***Tuesday, 12th of November 2024***
0730 – 0815	***Types of Discontinuities*** *In Castings ● In Ingots ● In Wrought Sections & Parts ● In Welds*
0815 – 0900	***Evaluation Techniques*** *Use of Standards-e.g. ASTM E 1444, E 3024, E 709 ● Defect Appraisal*
0900 - 0930	***Quality Control of Equipment & Processes*** *Malfunctioning of Equipment ● Proper Magnetic Particles & Bath Liquid ● Bath Concentration ● Test for Ultraviolet Radiation Intensity*
0930 – 0945	*Break*
0945 - 1145	***Theoretical Examination***
1145 – 1200	*Break*
1200 – 1300	***Theoretical Examination (cont'd)***
1300 - 1400	***Practical Examination***
1400 - 1415	***Course Conclusion***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & 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 "Magnetic Particle Testing (MT) Equipment" and our specifically designed flawed specimen test components.

Magnetic Particle Testing (MT) Equipment

Flawed Specimen Test Components

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org