

COURSE OVERVIEW FE0725-8D
ASNT Level I - Certification for UT, MT & PT
(ASNT, SNT-TC-1A)

Course Title

ASNT Level I – Certification for UT, MT & PT (ASNT, SNT-TC-1A)

Course Date/Venue

September 02-11,2024/Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference

FE0725-8D

Course Duration/Credits

Eight days/5.6 CEUs/56 PDHs



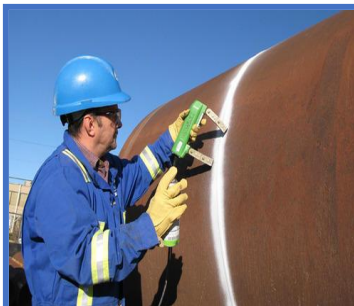
Course Description



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



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 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 PT, MT 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 I exam. Each candidate will be a 'Certified ASNT NDT Level I in Ultrasonic Testing, Magnetic Testing and Liquid Penetrant 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 (UT), Magnetic Particle Testing (MT) and Liquid Penetrant Testing (PT)
- 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 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
- 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
- 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 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 lighting, 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

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 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, 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:-

Initial Experience Levels			
NDT Method	Training Hours	Minimum Hours in the Applicable Method	Total Hours in NDT
UT	40	210	400
MT	12	70	130
PT	4	70	130

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 applicable NDT method. This shall be conducted upon initial certification and at five-year intervals thereafter.

General (Written)

- The 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)

- The examination will address the equipment, operating procedures and NDT techniques that the individual may encounter during specific assignments to the degree required by company written practice
- The specific examination will also cover the specifications or codes and acceptance criteria used in company 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 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)

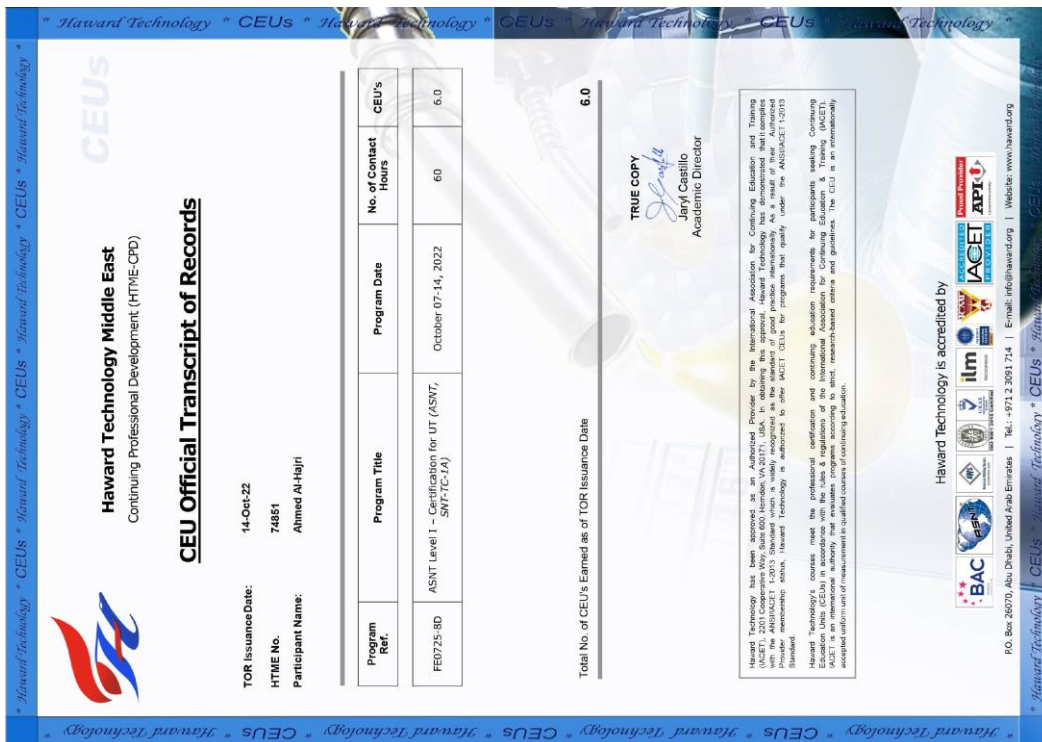
- (1) Internationally recognized Qualification Certificates will be issued to participants who have successfully completed the course and passed the exam at the end of the course. Successful candidate will be certified as a "Certified ASNT NDT Level-I in Ultrasonic Testing (UT)". Qualification Certificate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

Qualification Certificate(s)

The following qualification certificate is a sample of the qualification certificates that will be issued to successful candidates:



- (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





Qualification Certificate(s)

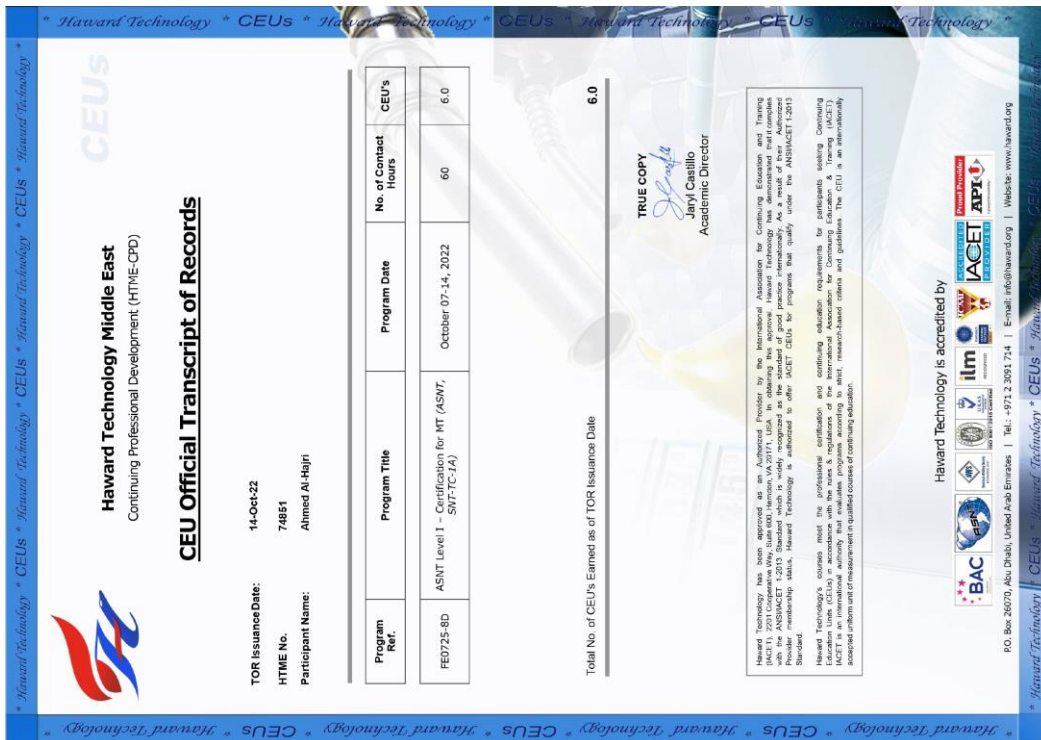
- (1) Internationally recognized Qualification Certificates will be issued to participants who have successfully completed the course and passed the exam at the end of the course. Successful candidate will be certified as a "Certified ASNT NDT Level-I in Magnetic Particle Testing (MT)". Qualification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

Qualification Certificate(s)

The following qualification certificate is a sample of the qualification certificates that will be issued to successful candidates:



- (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.





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 and Liquid Penetrant Testing (PT)". Qualification Certificate is valid for 5 years.

Qualification Certificate(s)

The following qualification certificate is a sample of the qualification certificates that will be issued to successful candidates:




- (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.





Course Accreditations

Certificates are accredited by the following international accreditation organizations:-

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The American Society for Non-destructive Testing (ASNT)


Haward Technology through its certified ASNT instructors is authorized to conduct ASNT’s certification programs for all NDT methods. The American Society For Non-destructive Testing (**ASNT**) is the world's largest technical society for non-destructive 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 **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.

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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:



Mr. Mohamed Hosny is a **Senior Inspection Engineer** with **25 years** of extensive training and field industrial experience within the **Oil & Gas, Petrochemical, Refinery, Utilities and Power** Industries. His expertise widely covers in the areas of **Non-destructive Inspection & Testing** in **Liquid Penetrant, Magnetic Particle, Ultrasonic and Radiographic, ASNT-NDT Fundamentals, Eddy Current Testing, Film Interpretation, Visual Testing, Ultrasonic Weld Inspection, X-Ray Machines Inspection, Welding, Rolling, Forging, Heat Treatment, Surface Treatment, Machinery, Casting, Laminar, Procedure & Inspection, Pipe Welding Inspection, Tube Weld Inspection, Tanks Inspection, Gas Turbine & Steam Turbine Inspection for Power Generation, NDT & Welding Procedures, NDT Repair Procedures, Weld Quality Testing & Applications, Welding Inspection, Heat Treatment Procedures, Post Weld Heat Treatment (PWHT), Welding Procedure Specification (WPS), Welding Codes & Qualification, Piping, Pipelines, Rotating & Static Equipment, Refractory Inspection, Risk Based Inspection, Risk Based Assessment, Damage Mechanisms, Fitness-for-Service, Failure Analysis Methodologies, Engineering Drawings, Risk Management, Heat Exchangers, Welding Technology, Metallurgy, Cathodic Protection and Vibration Analysis.** Further, he is also well-versed in L-wave, T-wave, S-wave, Kraut Kramer USM62, USM58, USM35X, USM32, USIP11, USN60, USN62, Normal Probes, Angle Probes, Twin Probes, Special Probes, Longitudinal, Transverse, Head Shot, Coil, Central Conductor, Knife Type, Flat Type, Prod, Electromagnetic Yoke, Permanent Yoke on Tiede & Magnaflux Machines (6000-12000A), Visible Dyes, Fluorescent Dyes, Immersion, Electrostatic, Spraying, Ardox & Magnaflux Products, Impedance Meter, Phase Analysis Instrument, Inside Coils (Bobbin), Surface Coils and Encircling Coils – Forester & Olympus Products. He is currently the **NDT Manager of Siemens Limited Technology** wherein he carries out NDT tasks on steam/gas turbine components as per the updated work instructions, technical drawing and protocol in due time.

During his career life, Mr. Mohamed gained his practical and field experience through his various significant positions and dedication as **NDT Supervisor, NDT Engineer, Senior Consultant/Instructor** and **Part-time Lecturer** for Arab Organization of Industrialization (AOI), Canadian Institute for Non-Destructive Test (**CINDE**), Harman Institute for Non-Destructive Test (**HINDE**), SNECMA Company, Turbomeca, **Siemens AG**, Arab Institute of Airplane Technology (**AIAT**), EPIC, Zahran Steel Company, Egypt Air Company, Petrojet Petroleum Company, Khalda Petroleum Company, Socomenin Company and El-Naher Company.

Mr. Mohamed has a **Bachelor's** degree in **Metallurgical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management (ILM)** and a **Certified ASNT-NDT Level III Inspector** in Liquid Penetrant Testing (**PT**), Magnetic Particle Testing (**MT**), Ultrasonic Testing (**UT**) and Radiography Testing (**RT**). Moreover, he is a **Certified Level II Inspector** in Eddy Current Testing (**ET**) in accordance with the **SNT-TC-1A** and **EN ISO-9712**. He has further 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\$ 9,000 per Delegate + **VAT**. This rate includes H-STK® (Howard 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: Monday, 02nd of September 2024

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 • 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: Tuesday, 03rd of September 2024

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
1700	End of Day Two

Day 3: Wednesday, 04th of September 2024

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
1700	End of Day Three

Day 4: Thursday, 05th of September 2024

0730 – 0930	Calibration (Electronic & Functional): Calibration of Equipment Electronics Variable Effects • Transmission Accuracy
0930 – 0945	Break
0945 – 1200	Calibration (Electronic & Functional): Calibration of Equipment Electronics (cont'd) Calibration Requirements • Calibration Reflectors
1200 - 1300	Lunch
1300 – 1500	Calibration (Electronic & Functional): Inspection Calibration 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: Friday, 06th of September 2024

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 - 1200	Lunch
1200 – 1500	Theoretical Examination
1500 – 1515	Break
1515 – 1550	Theoretical Examination (cont'd)
1550 - 1650	Practical Examination
1650 – 1700	Recap
1700	End of Day Five

Day 6: Monday, 09th of September 2024

0730 – 0830	Principles of Magnets & Magnetic Fields Theory of Magnetic Fields • Theory of Magnetism • Terminology Associated with Magnetic Particle Testing
0830 – 0930	Characteristics of Magnetic Fields Bar Magnet • Ring Magnet
0930 – 0945	Break
0945 – 1045	Effect of Discontinuities of Materials Surface Cracks • Scratches • Subsurface Defects
1045 – 1245	Magnetization by Means of Electric Current Circular Field • Longitudinal Field
1245 - 1345	Lunch
1345 – 1530	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
1530 – 1545	Break
1545 – 1650	Inspection Materials Wet Particles • Dry Particles
1650 – 1700	Recap
1700	End of Day Six

Day 7: Tuesday, 10th of September 2024

0730 – 0830	Principles of Demagnetization Residual Magnetism • Reasons for Requiring Demagnetization • Longitudinal & Circular Residual Fields • Basic Principles of Demagnetization • Retentivity and Coercive Force • Methods of Demagnetization
0830 – 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 – 1100	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
1100 - 1200	Lunch
1200 – 1500	Theoretical Examination
1500 – 1515	Break
1515 – 1550	Theoretical Examination (cont'd)
1550 - 1650	Practical Examination
1650 – 1700	Recap
1700	End of Day Seven

Day 8: Wednesday, 11th of September 2024

0730 – 0830	Introduction to Liquid Penetrant Testing 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
0830 - 0930	Liquid Penetrant Processing Preparation of Parts • Adequate Lightning • Application of Penetrant to Parts • Removal of Surface Penetrant • Developer Application & Drying • Inspection & Evaluation • Postcleaning
0930 – 0945	Break
0945 -1030	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
1030 - 1115	Liquid Penetrant Testing Equipment Liquid Penetrant Testing Units • Lightning for Liquid Penetrant Testing Equipment & Light • Materials for Liquid Penetrant Testing • Precautions in Liquid Penetrant Inspection
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 “Liquid Penetrant Testing (PT) Equipment”, “Magnetic Particle Testing (MT) Equipment”, “Ultrasonic Testing (UT) Equipment”, “Ultrasonic Testing Package USM 36” and our specifically designed flawed specimen test components.



Ultrasonic Testing (UT) Equipment



Magnetic Particle Testing (MT) Equipment



Liquid Penetrant Testing (PT) Equipment



Flawed Specimen Test Components

Course Coordinator

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