COURSE OVERVIEW FE1016
Inspection, Quality Management & Checks of Pipelines, Pumps & Process Equipment

Course Title
Inspection, Quality Management & Checks of Pipelines, Pumps & Process Equipment

Course Date/Venue
September 01-05, 2025/Boardroom 2 Meeting Room, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
FE1016

Course Duration/Credits
Five days/3.0 CEUs/30 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 simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Inspection, Quality Management & Checks of Pipelines, Pumps & Process Equipment. It covers the principles of industrial inspection, fundamentals of quality management and pipeline systems; the pumps in industrial systems, process equipment and codes, standards and regulatory compliance; the visual inspection techniques, pipeline NDT techniques and hydrostatic and pneumatic testing; the welding inspection and quality checks; the corrosion mechanisms in pipelines, pipeline quality documentation and pump performance testing; and the visual and functional inspection of pumps, pump failure analysis.

Further, the course will also discuss the seal system inspection and maintenance; the lubrication and bearing inspection and pump quality control procedures; the proper inspection of heat exchangers and pressure vessels; the storage tank inspection and quality management systems (QMS) in maintenance; the risk-based inspection (RBI) approach and fitness-for-service (FFS) evaluation; the inspection reporting, data management and frequency determination; the shutdown and turnaround planning, coordination with operations and safety teams; the resource and manpower allocation; and the internal versus external audits

During this interactive course, participants will learn the non-conformance detection and follow-up; the 5 Whys, Fishbone diagram and continuous improvement loops; the inspection during construction phases, material verification and traceability; and the welding and NDT coordination and turnover dossier completion.

Course Objectives

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

- Apply and gain an in-depth knowledge on inspection, quality management and checks of pipelines, pumps and process equipment
- Discuss the principles of industrial inspection, fundamentals of quality management, pipeline systems,
- Recognize pumps in industrial systems, process equipment and codes, standards and regulatory compliance
- Carryout visual inspection techniques, pipeline NDT techniques, hydrostatic and pneumatic testing and welding inspection and quality checks
- Discuss corrosion mechanisms in pipelines and apply pipeline quality documentation, pump performance testing and visual and functional inspection of pumps
- Employ pump failure analysis, seal system inspection and maintenance, lubrication and bearing inspection and pump quality control procedures
- Implement proper inspection of heat exchangers and pressure vessels, storage tank inspection and quality management systems (QMS) in maintenance
- Apply risk-based inspection (RBI) approach, fitness-for-service (FFS) evaluation and inspection reporting and data management
- Inspect frequency determination, and apply shutdown and turnaround planning, coordination with operations and safety teams and resource and manpower allocation
- Differentiate internal versus external audits and carryout non-conformance detection and follow-up, 5 whys and fishbone diagram and continuous improvement loops
- Apply inspection during construction phases, material verification and traceability, welding and NDT coordination and turnover dossier completion

Who Should Attend

This course provides an overview of all significant aspects and considerations of inspection, quality management and checks of pipelines, pumps and process equipment for project managers inspection supervisors inspection engineers, maintenance engineers, pipeline engineers, process and mechanical engineers, project engineers, junior engineers , quality assurance/quality control (QA/QC) personnel, maintenance technicians, pipeline technicians and other technical staff.

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**.*

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- 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 **3.0 CEUs** (Continuing Education Units) or **30 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. Steve Magalios, CEng, PGDip (on-going), MSc, BSc, is a **Senior Mechanical & Maintenance Engineer** with almost **30 years** of extensive **On-shore/Offshore** experience in the **Oil & Gas**, **Construction**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of Risk Based Inspection (**RBI**) Methodologies, **Piping & Process Equipment Design, Inspection, Maintenance RBI & FFS** (ASME & API Codes), **API-579/580/581: Risk-Based-Inspection (RBI), Fitness-for-Service (FFS) and Repair Practices of Pipelines, Piping, Vessels and Tanks** in Refineries, Gas, Oil and Petrochemical Facilities, **API 510, 570 & 653**: Inspection of Stationary Equipment, **Pipeline** Operation & Maintenance, **Pipeline** Systems, **Pipeline** Design & Construction, **Pipeline** Repair Methods, **Pipeline** Engineering, Pipeline Integrity Management System (**PIMS**), **Pump** Technology, Fundamentals of **Pumps**, **Pump** Selection & Installation, **Centrifugal Pumps & Troubleshooting**, **Reciprocating & Centrifugal Compressors**, **Process Control Valves, Process Equipment Design, Process Equipment and Piping Systems: Application, Design and Operation**, Industrial **Valve Inspection** & Performance **Testing,** Field **Testing** & **Inspection** of Industrial Valves, **API**-Based **Valve** Testing & Inspection Procedures, **Troubleshooting** & Repair of Failed **Valves,** Gate Valve Design, Field **Evaluation** & **Testing** of **Gate Valves,** Operational Reliability of **Gate Valves** in **Process Systems, Butterfly Valve** Operation, **Valve** Testing, **Pressure Vessels** Fabrication, **Material Science & Selection**, **Composite Repair Materials**, **Material Selection & Properties**, **Material & Inspection Foundation**, **Refractory Material Design, Application**, **Installation & Inspection**, **Preventive & Predictive** Maintenance, **Reliability Centered** Maintenance, **Applied Maintenance** Management, **Reliability** Modelling, **Reliability** Techniques, **Reliability Design** Techniques, Advanced **Root Causes** Analysis & Techniques, **Reliability** Management, **Pipeline Hot Tapping**, **Hot Tapping** Equipment, **Hot Tapping Operation**, **Boiler** Inspection & Maintenance, **Boiler** Systems, **Boiler** instrumentation & Controls, **Boiler** Start-up & Shutdown, **Boiler** Operation & Steam System Management, **Pipe Cuttings**, **Flange Bolt Tightening** Sequence, **Hydro Testing**, **Screw Compressor**, **Compressor** Control & Protection, **Gas & Steam Turbines**, **Turbine** Operations, **Gas Turbine** Technology, **Valves**, , **API 598: Valve Inspection and Testing**, **Bearings & Lubrication**, Advanced **Machinery Dynamics**, **Rubber Compounding**, **Elastomers**, **Thermoplastic**, **Industrial Rubber Products**, **Rubber** Manufacturing Systems, **Heat Transfer**, **Vulcanization Methods**, **Welding** Engineering, **Fabrication** & Inspection, **Welding** Techniques. Currently, he is the **Chartered Professional Surveyor Engineer & Urban-Regional Planner** wherein he is deeply involved in providing exact data, measurements and determining properly boundaries. He is also responsible in preparing and maintaining sketches, maps, reports and legal description of surveys.

During his career, Mr. Magalios has gained his expertise and thorough practical experience through challenging positions such as a **Project Site Construction Manager**, **Supervision Head/Construction Manager**, **Construction Site Manager**, **Project Manager**, **Deputy PMS Manager**, **Head of the Public Project Inspection Field Team**, **Technical Consultant**, **Senior Consultant**, **Consultant/Lecturer**, **Construction Team Leader**, **Lead Pipeline Engineer**, **Project Construction Lead Supervising Engineer**, **Lead Site Engineer**, **Senior Site Engineer Lead Engineer**, **Senior Site Engineer**, **Mechanical Engineer**, **R.O.W. Coordinator**, **Site Representative**, **Supervision Head**, **Contractor**, Client Site Representative and Acting Client Site Representative for international Companies such as the Public Gas Corporation, Penspen International Limited, Eptista Servicios de Ingeneria S.I., J/V ILF Pantec TH. Papaioannou & Co. – Emenergy Engineering, J/V Karaylannis S.A. – Intracom Constructions S.A., Ergaz Ltd., Alkyonis 7, Palaeo Faliro, Piraeus, Elpet Valkaniki S.A., Asprofos S.A., J/V Depa S.A. just to name a few.

Mr. Magalios is a **Registered Chartered Engineer** and has **Master** and **Bachelor** degrees in **Surveying Engineering** from the **University of New Brunswick**, **Canada** and the **National Technical University of Athens**, **Greece**, respectively. Further, he is currently enrolled for **Post-graduate** in **Quality Assurance** from the **Hellenic Open University**, **Greece**. He has further obtained a Level 4B Certificates in Project Management from the National & Kapodistrian University of Athens, Greece and Environmental Auditing from the Environmental Auditors Registration Association (EARA). Moreover, he is a **Certified Instructor/Trainer**, a **Chartered Engineer** of Technical Chamber of Greece and has delivered numerous trainings, workshops, seminars, courses and conferences internationally.

Course Fee

US$ 5,500 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.

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 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, 01st of September 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Principles of Industrial Inspection*** *Purpose & Scope of Inspection • Types of Inspection: Visual, Dimensional, NDT • Frequency & Timing of Inspections • Inspector Roles & Responsibilities*
0930 – 0945	*Break*
0945 – 1030	***Fundamentals of Quality Management*** *Definition & Importance of Quality in Operations • ISO 9001 & QMS Overview • Key Quality Principles (PDCA, Risk-Based Thinking) • Quality Planning & Assurance in Maintenance*
1030 – 1130	***Overview of Pipeline Systems*** *Pipeline Components & Layout • Materials of Construction • Pressure Ratings & Design Codes • Common Pipeline Failures & Causes*
1130 – 1215	***Pumps in Industrial Systems*** *Types of Pumps (Centrifugal, Positive Displacement) • Key Components & Flow Dynamics • Operating Parameters & Curves • Installation & Alignment Considerations*
1215 – 1230	*Break*
1215 – 1230	***Process Equipment*** *Types: Heat Exchangers, Reactors, Tanks, Vessels • Key Process Functions & Operation • Design Standards (ASME, API, etc.) • Maintenance Requirements*

1230 - 1420	***Codes, Standards & Regulatory Compliance*** *API, ASME, ASTM Relevance • Inspection Codes: API 570, 653, 510 • Pressure Equipment Directive (PED) Overview • Local Authority & SEMBCORP Compliance Requirements*
1420 – 1430	***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*
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 02nd of September 2025***

0730 – 0900	***Visual Inspection Techniques*** *Tools for Visual Inspection • Common Defects: Corrosion, Cracks, Weld Defects • Surface Preparation & Lighting Requirements • Documentation & Defect Categorization*
0900 – 0930	***Pipeline NDT Techniques*** *Ultrasonic Testing (UT) Basics • Radiographic Testing (RT) Interpretation • Magnetic Particle & Dye Penetrant Testing • Acoustic Emission & Advanced NDT*
0930 – 0945	*Break*
0945 – 1100	***Hydrostatic & Pneumatic Testing*** *Test Pressure Calculation • Test Medium Selection • Leak Detection Procedures • Test Documentation & Acceptance Criteria*
1100 – 1230	***Welding Inspection & Quality Checks*** *Weld Joint Types & Symbols • WPS, PQR & Welder Qualifications • Inspection Stages: Pre-Weld, In-Process, Post-Weld • Common Welding Defects & Rejection Standards*
1215 – 1230	*Break*
1230 – 1330	***Corrosion Mechanisms in Pipelines*** *Uniform, Pitting & Crevice Corrosion • MIC (Microbiologically Influenced Corrosion) • Corrosion Rate Monitoring Methods • Coatings, Linings & Cathodic Protection*
1330 – 1345	***Pipeline Quality Documentation*** *Inspection Test Plans (ITPs) • Quality Control Checklists • Non-Conformance Reports (NCRs) • QA/QC Dossier Preparation*
1420 – 1430	***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*
1430	*Lunch & End of Day Two*

Day 3: ***Wednesday, 03rd of September 2025***

0730 – 0900	***Pump Performance Testing*** *Flow, Head, Power & Efficiency Curves • Performance vs Design Data • Vibration & Noise Checks • Pump Acceptance Criteria*
0900–0930	***Visual & Functional Inspection of Pumps*** *Casing, Shaft & Seal Inspection • Impeller & Bearing Condition Checks • Alignment & Anchorage Integrity • Operational Safety Checks*
0930 – 0945	*Break*

0945 – 1100	***Pump Failure Analysis*** *Common Failure Modes: Cavitation, Misalignment • Root Cause Analysis Techniques • Condition-Based Failure Detection • Preventive vs Reactive Maintenance*
1100 – 1230	***Seal System Inspection & Maintenance*** *Types of Mechanical Seals • Seal Flushing Plans • Seal Failure Indications • Installation & Troubleshooting Techniques*
1215 – 1230	*Break*
1230 – 1330	***Lubrication & Bearing Inspection*** *Lubricant Selection & Contamination Control • Bearing Housing Temperature & Vibration • Greasing Intervals & Quantity • Signs of Bearing Fatigue*
1330 – 1345	***Pump Quality Control Procedures*** *Quality Assurance in Procurement & Installation • Factory Acceptance Testing (FAT) • Maintenance Logs & Inspection Reports • Performance Improvement Through KPI Tracking*
1420 – 1430	***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*
1430	*Lunch & End of Day Three*

Day 4: ***Thursday, 04th of September 2025***

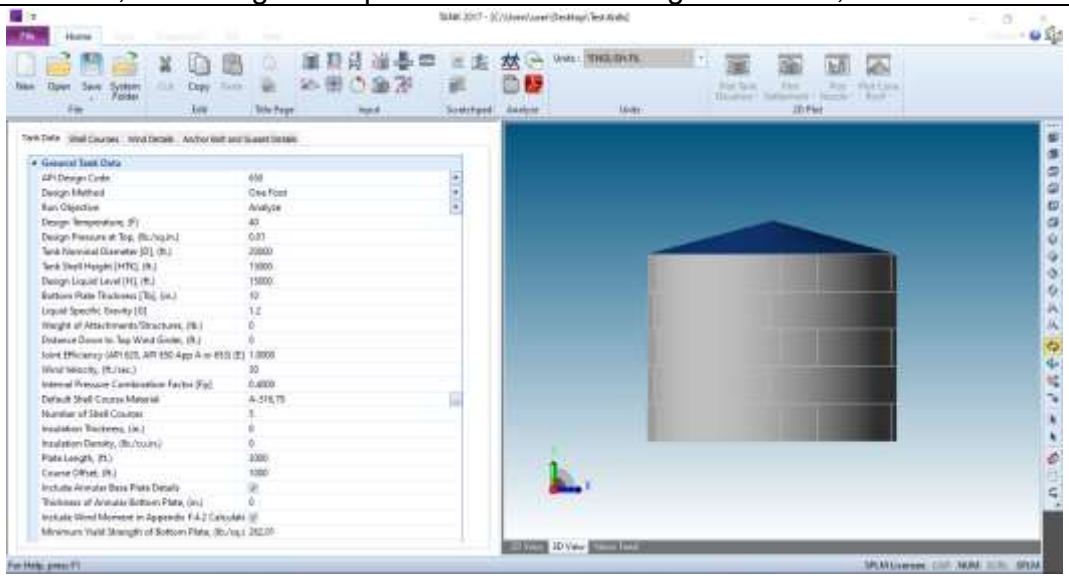
0730 – 0900	***Inspection of Heat Exchangers & Pressure Vessels*** *Tube Inspection & Fouling Checks • Shell-Side & Tube-Side Cleaning Inspection • Leak Testing & Pressure Verification • Integrity of Expansion Joints & Gaskets*
0900 – 0930	***Storage Tank Inspection (API 653)*** *Tank Bottom Scanning & Corrosion Mapping • Roof & Shell Inspection • Settlement & Foundation Checks • Tank Calibration & Certification*
0930 – 0945	*Break*
0945 – 1100	***Quality Management Systems (QMS) in Maintenance*** *Quality Objectives & KPIs • Internal Audits & Corrective Actions • Supplier Quality Management • Continuous Improvement in Inspection Systems*
1100 – 1230	***Risk-Based Inspection (RBI) Approach*** *RBI Methodology Overview • Damage Mechanisms & Likelihood Assessment • Inspection Interval Determination • Risk Matrix Application*
1215 – 1230	*Break*
1230 – 1330	***Fitness-for-Service (FFS) Evaluation*** *API 579 Assessment Levels • Deterioration vs Operational Limits • Remaining Life Estimation • Decision-Making for Repair or Replacement*
1330 – 1345	***Inspection Reporting & Data Management*** *Digital Inspection Records • Report Structure & Photographic Evidence • KPI Tracking & Dashboard Reporting • Compliance Traceability*
1420 – 1430	***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*
1430	*Lunch & End of Day Four*

Day 5: ***Friday, 05th of September 2025***

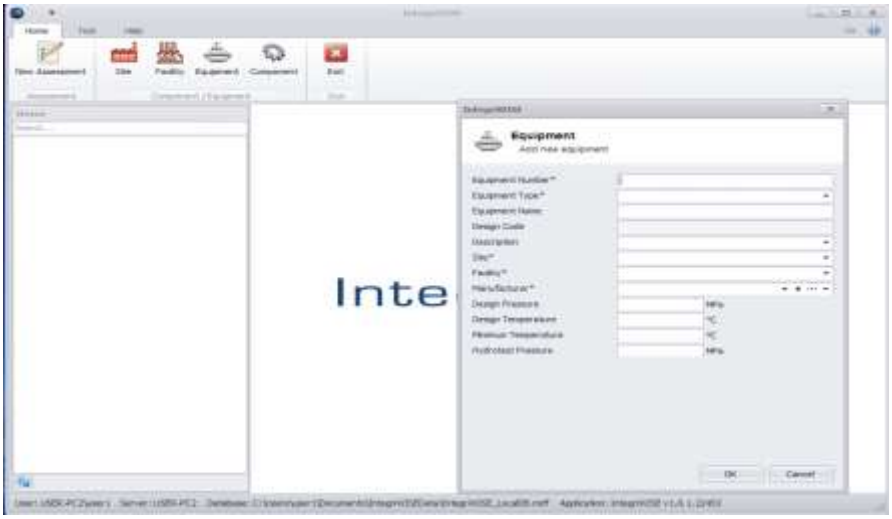
0730 – 0830	***Inspection Planning & Scheduling*** *Inspection Frequency Determination • Shutdown & Turnaround Planning • Coordination with Operations & Safety Teams • Resource & Manpower Allocation*
0830 – 0930	***Quality Audits & Root Cause Analysis*** *Internal vs External Audits • Non-Conformance Detection & Follow-Up • 5 Whys & Fishbone Diagram • Continuous Improvement Loops*
0930 – 0945	*Break*
0945 - 1100	***Case Studies: Pipeline & Pump Failures*** *Real-Life Failure Incidents • Inspection Errors versus Design Flaws • Lessons Learned • Recommendations Implementation*
1100 – 1230	***Integrated QA/QC for Projects*** *Inspection During Construction Phases • Material Verification & Traceability • Welding & NDT Coordination • Turnover Dossier Completion*
1230 – 1245	*Break*
1245 – 1315	***Inspection Walkthrough*** *Simulated Pipeline & Pump Inspection • Reporting Identified Defects • Team-Based Evaluation • Review Against Acceptance Standards*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on 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 various exercises using the simulator "Hexagon PPM COADE TANK 2017 SP1 v9.00.01 (Integraph Tank)", "IntegriWISETM", "Centrifugal Pumps and Troubleshooting Guide 3.0", and "PIPE-FLO".



Hexagon PPM COADE TANK 2017 SP1 v9.00.01 (Integraph Tank)



IntegriWISE™

Centrifugal Pumps and Troubleshooting Guide 3.0

PIPE-FLO

Course Coordinator

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