COURSE OVERVIEW FE0014-4D
ASME B31.3 Process Piping Design, Construction & Mechanical Integrity

Course Title
ASME B31.3 Process Piping Design, Construction & Mechanical Integrity

Course Reference
FE0014-4D

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	January 08-11, 2024	Club B Meeting Room, Ramada Plaza by Wyndham Istanbul City Center, Istanbul, Turkey
2	April 15-18, 2024	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
3	July 01-04, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
4	October 07-10, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Description

This practical 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 ASME B31.3 Process Piping Design, Construction and Mechanical Integrity. It covers the ASME B31.3 code and its significance in process piping design; the design, construction and mechanical integrity requirements; designing conditions and parameters in process piping, pressure and temperature calculations and piping components and supports; the material selection criteria and stress analysis methodologies; and the pipe sizing and pressure drop calculations.

Further, the course will also discuss the fluid properties and their impact on piping design; the pipe sizing criteria and methods; the pressure drop calculations for single-phase and multiphase flow; selecting piping components based on pressure drop limitations; the piping materials, fabrication and installation; the material selection guidelines and considerations; the manufacturing processes for piping materials, fabrications and installation practices; the welding procedures and inspection requirements; and the non-destructive examination techniques.

During this interactive course, participants will learn the flange design and selection; the gasket selection, bolted joint assembly, tightening procedures and flange leakage and testing; the piping system components and specialty items; the instrumentation and control considerations; the pressure testing requirements and procedures; the test medium selection, leak detection methods, test acceptance criteria and documentation and records; the inspection techniques for process piping; the corrosion mechanisms and prevention; the fitness-for-service evaluations and risk-based inspection strategies; the maintenance and repair considerations; the piping and instrumentation diagrams (P&IDs) and isometric and orthographic drawings; the material and equipment specifications, piping standards and codes; the documentation control and management, mechanical integrity programs, regulatory requirements and compliance considerations; the risk assessment methodologies and management of change (MOC) procedures; and the auditing evaluation of process piping systems.

Course Objectives

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

- Apply and gain an in-depth knowledge on process piping design, construction and mechanical integrity in accordance with ASME B31.3 standard
- Discuss ASME B31.3 code and its significance in process piping design as well as the design, construction and mechanical integrity requirements
- Design conditions and parameters in process piping, pressure and temperature calculations and piping components and supports
- Recognize material selection criteria and stress analysis methodologies
- Employ pipe sizing and pressure drop calculations and recognize fluid properties and their impact on piping design
- Identify pipe sizing criteria and methods, apply pressure drop calculations for single-phase and multiphase flow and select piping components based on pressure drop limitations
- Carryout piping materials, fabrication and installation including material selection guidelines and considerations
- Apply manufacturing processes for piping materials, fabrications and installation practices, welding procedures and inspection requirements and non-destructive examination techniques
- Employ flange design and selection, gasket selection, bolted joint assembly, tightening procedures and flange leakage and testing
- Identify piping system components covering valves and their selection criteria, expansion joints and their applications and piping supports and restraints
- Identify specialty items comprising of strainers, filters, vents, drains, etc. and instrumentation and control considerations
- Recognize pressure testing requirements and procedures and apply test medium selection, leak detection methods, test acceptance criteria and documentation and records
- Employ inspection techniques for process piping, corrosion mechanisms and prevention, fitness-for-service evaluations, risk-based inspection strategies and maintenance and repair considerations

- Illustrate piping and instrumentation diagrams (P&IDs) and isometric and orthographic drawings
- Recognize material and equipment specifications, piping standards and codes and documentation control and management
- Organize mechanical integrity programs and identify regulatory requirements and compliance considerations
- Recognize risk assessment methodologies and apply management of change (MOC) procedures and audit evaluation of process piping systems

Who Should Attend

This course provides an overview of all significant aspects and considerations of ASME B31.3 process piping design, construction and mechanical integrity for engineers, maintenance staff and inspectors responsible for the integrity, maintenance and repair of pipelines and piping systems. Further, the course is essential for engineers in charge of pipeline or piping design, project engineers, site/field engineers, piping/pipeline project managers, senior draftsmen and other technical staff.

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

Istanbul	**US$ 5,000** per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	**US$ 4,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	**US$ 4,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	**US$ 4,500** 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.

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: -

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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. Steve Magalios, CEng, PGDip (on-going), MSc, BSc, is a **Welding & Pipeline Engineer** with almost **40 years** of extensive **On-shore/Offshore** experience in the **Oil & Gas**, **Construction**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Pipeline Hot Tapping**, **Hot Tapping** Equipment, **Hot Tapping Operation**, **Welding** Engineering, **Fabrication** & Inspection, **Welding** Techniques, Practical **Welding** Technology, **Welding** Inspection, **Welding & Machine Shop**, **Welding & Machining**, **Welding** Types & Applications, **Welding** Safety, **Welding** Defects Analysis, **TIG & Arc Welding**, **Shielded Metal Arc Welding**, **Gas Tungsten & Gas Metal Arc Welding**, **Welding** Procedure Specifications & Qualifications (WPS & WPQ), **Aluminium Welding**, Safe **Welding**, International **Welding Codes**, **Welding Procedure** Specifications, **Welding & Brazing**, **Welder** Performance Qualification, **Pipeline** Operation & Maintenance, **Pipeline** Systems, **Pipeline** Design & Construction, **Pipeline** Repair Methods, **Pipeline** Engineering, Pipeline Integrity Management System (**PIMS**), **Pipeline** Pigging, Piping & Pipe Support Systems, **Piping** Systems & Process Equipment, **Piping** System Repair & Maintenance and **Piping** Integrity Management. Further, he is also well-versed in Computer Aided Design (**CAD**), **Building & Road** Design Skills, **Civil Engineering Design**, **Structural Reliability** Engineering, **Road** Construction & Maintenance, **Concrete Structures & Building Rehabilitation**, **Reinforced Concrete Structures Protection**, **Geosynthetics & Ground Improvement Methods**, **Blueprint** Reading & Interpretation, **Blue Print** Documentation, Mechanical **Drawings**, **P&ID**, **Flow Diagram** Symbols, **Land Surveying** & Property Evaluation, **Cartographic** Representation, Soil Classification, **Cadastral Surveying** & Boundary Definition, **Project Engineering** & Design, **Construction** Management, **Project Planning** & Execution, **Site Management**, **Site Supervision**, Effective **Resource Management**, **Project Evaluation**, **FEED** Management, **EPC Projects** Design, **Project Completion & Workover**, **AutoCAD**, **STAAD-PRO**, GIS, ArcInfo, ArcView, Autodesk Map and various programming languages such as FORTRAN, BASIC and AUTOLISP. 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**, **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 a **Master's** and **Bachelor's** degree 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 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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction of ASME B31.3*** *Introduction to ASME B31.3 Code & Its Significance in Process Piping Design • Scope & Purpose of the Code • Understanding the Code Organization & Key Sections • Overview of the Design, Construction & Mechanical Integrity Requirements*
0930 – 0945	*Break*
0945 – 1030	***Design Considerations*** *Design Conditions & Parameters in Process Piping • Material Selection Criteria*
1030 – 1230	***Design Considerations (cont'd)*** *Design Pressure & Temperature Calculations • Stress Analysis Methodologies*
1230 – 1245	*Break*
1245 – 1420	***Design Considerations (cont'd)*** *Design of Piping Components & Supports*
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

0730 – 0930	***Pipe Sizing & Pressure Drop Calculations*** *Fluid Properties & their Impact on Piping Design • Pipe Sizing Criteria & Methods • Pressure Drop Calculations for Single-Phase & Multiphase Flow • Selection of Piping Components Based on Pressure Drop Limitations*
0930 – 0945	*Break*
0945 – 1100	***Piping Materials, Fabrication & Installation*** *Material Selection Guidelines & Considerations • Manufacturing Processes for Piping Materials • Fabrication & Installation Practices • Welding Procedures & Inspection Requirements • Non-Destructive Examination Techniques*
1100 – 1230	***Flanges, Gaskets & Bolting*** *Flange Design & Selection • Gasket Selection & Types*
1230 – 1245	*Break*
1245 – 1420	***Flanges, Gaskets & Bolting (cont'd)*** *Bolted Joint Assembly & Tightening Procedures • Flange Leakage & Testing*
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

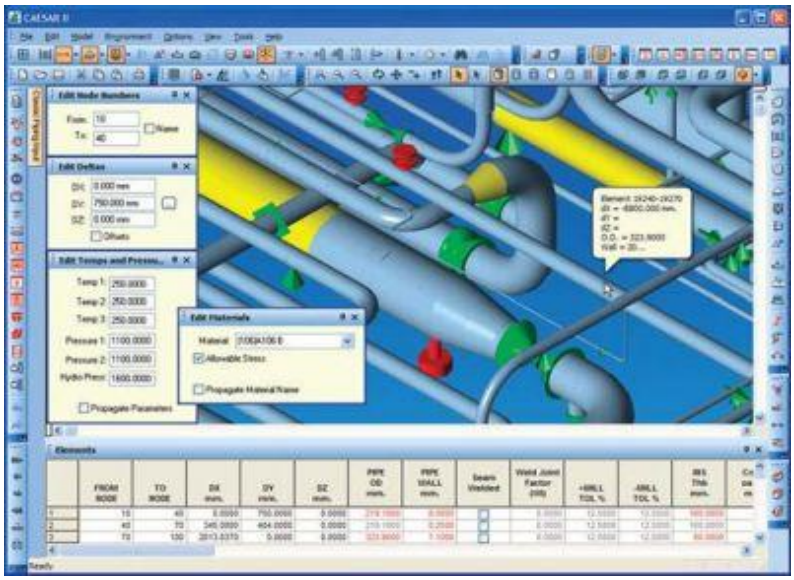
0730 – 0930	***Piping System Components*** *Valves & their Selection Criteria • Expansion Joints & their Applications • Piping Supports & Restraints • Specialty Items (Strainers, Filters, Vents, Drains, etc.) • Instrumentation & Control Considerations*
0930 – 0945	*Break*
0945 – 1100	***Pressure Testing Requirements & Leak Detection*** *Pressure Testing Requirements & Procedures • Test Medium Selection • Leak Detection Methods (Visual, Hydrostatic, Pneumatic, etc.) • Test Acceptance Criteria • Documentation & Records*
1100 – 1230	***Inspection & Maintenance*** *Inspection Techniques for Process Piping • Corrosion Mechanisms & Prevention • Fitness-for-Service Evaluations*
1230 – 1245	*Break*
1245 – 1420	***Inspection & Maintenance (cont'd)*** *Risk-Based Inspection Strategies • Maintenance & Repair Considerations*
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

0730 – 0930	***Piping Documentation & Standards*** *Piping & Instrumentation Diagrams (P&IDs) • Isometric & Orthographic Drawings • Material & Equipment Specifications*
0930 – 0945	*Break*
0945 – 1100	***Piping Documentation & Standards (cont'd)*** *Piping Standards & Codes • Documentation Control & Management*
1100 – 1230	***Mechanical Integrity & Compliance*** *Overview of Mechanical Integrity Programs • Regulatory Requirements & Compliance Considerations • Risk Assessment Methodologies*
1230 – 1245	*Break*
1245 – 1345	***Mechanical Integrity & Compliance (cont'd)*** *Management of Change (MOC) Procedures • Auditing & Evaluation of Process Piping Systems*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical session 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 “CAESAR II”.



CAESAR II

Course Coordinator

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