

COURSE OVERVIEW OE0320-4D

Subsea Pipelines & Offshore Structures

Inspection, Maintenance & Repair

Course Title

Subsea Pipelines & Offshore Structures:
Inspection, Maintenance & Repair

Course Date/Venue

Session 1: August 12-15, 2024/Cheops Meeting Room, Radisson Blu Hotel, Istanbul Sisli, Turkey

Session 2: November 04-07, 2024/Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE



Course Reference

OE0320-4D



Course Duration/Credits

Four days/2.4 CEUs/24 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course outlines the hazard, consequences and risks associated with operation of offshore structures and pipelines, details the conventional and stress-associated degradation mechanisms and the range of inspection and testing methods that can be applied.



The options for degradation control are presented with case histories of both failures and successes. Where proactive maintenance has been ineffective then the course details typical cost-effective repair procedures that are available. Particular emphasis is placed on pipeline networks where it is necessary to combine statistical analyses with modeling to prioritize the inspection programme.



Corrosion monitoring requirements are covered and the possible advantages of advanced monitoring techniques are outlined. Cathodic protection surveying and retrofitting are also detailed in the light of the new CP design code for submarine pipelines. As part of the course the delegates will be expected to partake in an inspection planning exercise.

Course Objectives

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

- Inspect, maintain and repair subsea pipelines and offshore structures in professional manner
- Discuss the methodologies of Inspection, Maintenance and Repair (IMR) and identify the types of risk assessment approach used in IMR
- Explain the structural failure modes of jackets including fatigue, risers, dropped objects, pipeline jacking and scour mechanisms
- Employ the various procedures in the inspection and repair of subsea pipelines and offshore structures
- Enumerate corrosion issues covering seawater corrosion and corrosion under marine fouling as well as explain its recommended practices
- Discuss subsea pipelines particularly their construction and list down some case histories of problems encountered during pipeline construction
- Employ systematic procedures of hydrotesting and recognize its importance as an inspection tool
- Describe the concept of free span including the use of sidescan sonar and laser camera systems in evaluation and repair of free spans
- Explain the on-bottom stability by describing the design of weight coatings and identifying the impact of climate change on pipeline stability and the additional provisions on bottom stability
- Determine the various subsea pipeline failures and the different methods of repair of damaged subsea pipelines
- Explain the concept of cathodic protection including the design codes, methods of CP surveying, analysis of data and coating condition
- Describe internal corrosion comprising its morphology, inspection, monitoring and evaluation
- Identify the various types of pigging and explain their features, functions and limitations
- Implement the statistical methods used in corrosion data evaluation and the various procedures used in the prevention of corrosion
- Carryout methods of cathodic protection retrofitting and demonstrate the calculation method to evaluate protection limits

Who Should Attend


This course provides a wide understanding and deeper appreciation on inspection, maintenance and repair of subsea pipelines and offshore structures for structural, pipeline and subsea engineers as well as integrity, corrosion, inspection and maintenance engineers. The risk assessment approach will have direct relevance to the work of planning and project engineers and to the managers charged with control and prioritization of the inspection and control programmes.

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:-

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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 **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.

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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 Fee

Istanbul	US\$ 7,250 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	US\$ 6,750 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day

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. Magdy Tawfik, PhD (on-going), MSc, BSc, is a **Senior Pipeline & Marine Engineer** with over **35 years** of extensive **offshore/onshore** experience within the **Oil & Gas, Petrochemical** and **Refinery** industries. His expertise widely covers in the areas of **SIRE Program, Vetting Process, Vetting Inspection, Marine Vetting & Audit Criteria Manual, Marine & Ship Vetting, Vetting Process & Marine Safety Criteria, Tanker Vetting, Ship Vetting, Marine Terminal Operations & Management, Oil & Gas Marine Terminal Optimization, Marine Hazards Prevention & Control, Marine Insurance, Marine Operation & Terminal Auditing, Maritime Law Applications, Fleet Management & Operations, Seamanship & Survival Crafts, ISM Code, Life Saving at Sea, Port Safety Awareness, Inspection & Maintenance Subsea Pipelines, Offshore Structures, Offshore Systems Design Construction, Pipeline Inspection & Testing, Integrity Assessment, Advanced Internal Corrosion of Pipelines, Pipeline Inspection & Testing, Pipeline Pigging, Modern Welding Technology, Welding, Fabrication & Inspection, Gas Pipes & Valves Installation & Inspection, Gas Tanks, Magnetic Practical Testing, Radiographic Testing, Liquid Penetrant Testing, Welding Application, Hydraulic Equipment Operation, Maintenance & Troubleshooting, Jetty Operations Safety, Pumps & Compressors Operation and Pipeline Integrity.**

During his career life, Mr. Tawfik has various challenging key positions and dedication as the **Director, Deputy CEO, Chairman & CEO, HSE General Manager, Chairman Assistant** and **Senior Instructor/Trainer** for several international companies like the Egyptian General Petroleum Corp. (EGPC), Middle East Oil Tankage & Pipeline Co., Egyptian Company for Gas Services, Gas Metro, Petroleum Maintenance Co. (PETROMAINT) and Egyptian Petrochemical companies.

Mr. Tawfik has a **Master's** degree in **Pipeline Integrity** and **Business Administration**, a **Bachelor's** degree in **Mechanical Engineering** and currently enrolled as **PhD** in **Engineering of Renewal Energy**. Further, he is a **Certified Instructor/Trainer**, a **Certified Trainer, Assessor & Internal Verifier** by the **Institute of Leadership of Management (ILM)** and has delivered numerous courses, seminars, workshops, trainings and conferences internationally.

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Workshops & Work Presentations
- 30% Case Studies & Practical Exercises
- 20% Software, Simulators & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

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

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0900	Introduction to Inspection, Maintenance & Repair (IMR) <i>Risk Assessment Approach • IMR Philosophy • Priorities • Corrosion Risk Assessments • Qualitative and Quantitative Approaches</i>
0900 – 1000	Risk Assessment Exercise
1000 – 1015	<i>Break</i>
1015 – 1100	Structures Overview <i>Function and Construction of Jackets; Construction Codes, Geotechnical Issues, Installation of Risers • Subsea Completions</i>
1100 – 1200	Structural Failure Modes of Jackets <i>Enhanced Loading by Marine Fouling • Fatigue • Evaluation of Fatigue Loading at Nodes • Fatigue of Risers • Riser Clamps • Dropped Objects • Pipeline Jacking • Scour Mechanisms</i>
1200 – 1230	Inspection & Repair Procedures <i>Diver Surveys • Cleaning off of Marine Growths • Magnetic Particle Inspection • Structural Engineering • Scour Prevention</i>
1230 – 1245	<i>Break</i>
1245 – 1315	Corrosion Issues <i>Design Codes • Recommended Practices • Seawater Corrosion • Corrosion Under Marine Fouling • Interactions Between Pipelines and Jackets • Coatings and Cathodic Protection</i>
1315 – 1420	Pipelines Overview <i>Construction of Pipelines • Relevance of Construction Codes to Safety and Reliability • Contract Strategy and the Implications to Pipeline Functionality • Geopigs and Geographical Information Systems • Pipeline to Riser Transitions • Crossings</i>
1420 – 1430	Recap <i>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</i>
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Construction Issues <i>Case Histories of Problems Encountered During Pipeline Construction</i>
0830 – 0945	Hydrotesting <i>Initial Hydrotesting Philosophy • Use of Hydrotesting as an Inspection Tool • Golden Welds and Flange Connections • Flexible Pipe</i>
0945 – 1000	<i>Break</i>



1000 – 1100	Spans Use of Sidescan Sonar • Laser Camera Systems • Evaluation of Spans • Repair of Spans • Control of Vortex-Induced Vibration
1100 – 1200	Spans Assessment Exercise
1200 – 1230	Discussion of Conclusions of Assessment Exercise
1230 – 1245	Break
1245 – 1315	On-Bottom Stability Design of Weight Coatings • Impact of Weather/Climate Change on Pipeline Stability • Provision of Additional on Bottom Stability • Case Studies
1315 – 1345	On-Bottom Stability Design Exercise
1345 - 1420	Pipeline Failure Case Histories Case Histories of Pipeline Failures • How Identified, Repair Procedures Used, Alternative Options
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 – 0830	Pipeline Failure Case Histories
0830 - 0945	Pipeline Repair Methods of Repair of Damaged Pipelines • Stopples • Pipe Freezing • Magic Flanges • Installation of Pipeline Sections • Design and Use of Platelets for Sealing Pipeline Leaks
0945 – 1000	Break
1000 – 1100	Repair Design Exercise
1100 – 1200	Cathodic Protection Design Codes • Methods of CP Surveying • Video Surveys • Analysis of the Data • Coating Condition Evaluation from CP Surveys
1200 - 1230	Surveying of Jacket Cathodic Protection Diver Surveys • Dropped Reference Electrode • Transponders • CP Retrofitting
1230 – 1245	Break
1245 – 1315	Jacket Risk Assessment Exercise
1315 – 1345	Internal Corrosion Corrosion Morphology • Risk Based Inspection Methodology • Monitoring of Internal Corrosion • Use of Chemical Analysis • Microbiological Evaluations • Evaluation of Pigging Debris
1345 - 1420	Housekeeping Pigging Types of Pigs • Limitation of Pigs • When to Use Pigs and the Type of Pig to Use • Evaluation of Debris from Pipelines • Stuck Pigs • Damage to Pigs
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

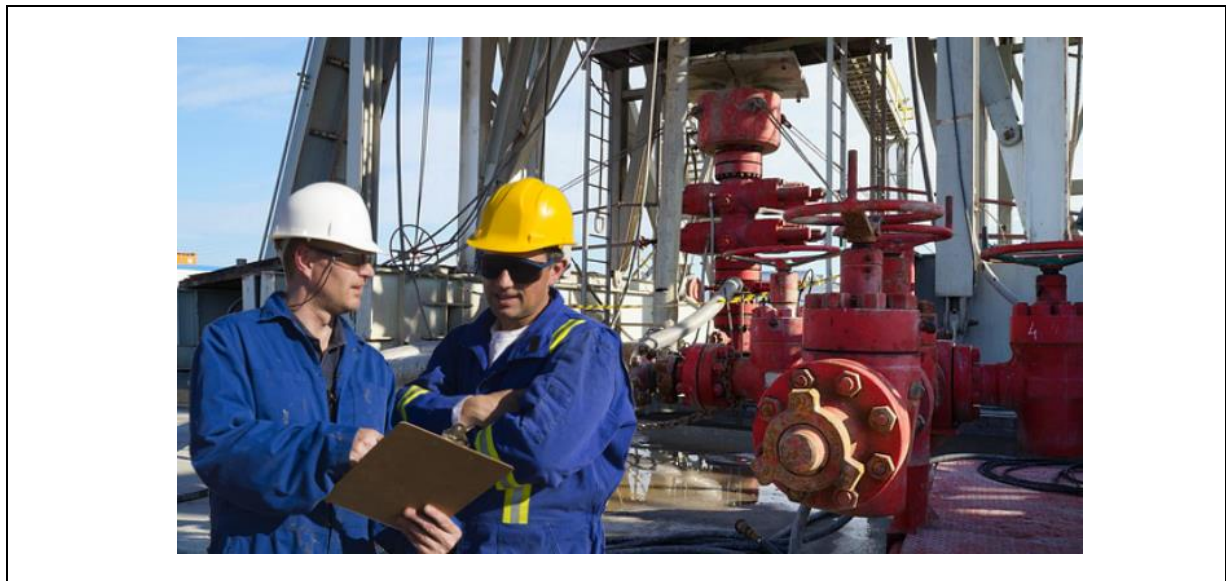


Day 4

0730 – 0830	Intelligent Pigging Magnetic Flux Pigs • Ultrasonic Pigs • Special Pigs for Cracking, Longitudinal Defects, Heavy Schedule Pipe (Thick Wall) • Preparation for Intelligent Pigging
0830 – 0930	Intelligent Pigging Assessment Exercise
0930 – 0945	Break
0945 – 1045	Corrosion Data Evaluation Statistical Methods • Trend Analysis • Qualitative and Semi-Quantitative Corrosion Risk Assessments • ASME B31G and Other Defect Assessment Techniques
1045 – 1130	Corrosion Data Evaluation Exercise
1130 – 1230	Prevention of Corrosion Corrosion Inhibition • Evaluation of Corrosion Inhibitors by Laboratory Testing • Field Testing of Inhibitors • Biocide Evaluation • Field Testing of Biocides
1230 – 1245	Break
1245 – 1315	Cathodic Protection Retrofitting Retrofitting to Structures • Impressed Current Systems • Retrofitting on Pipelines Using Rafts • Calculation Methods to Evaluate Protection Limits
1315 – 1345	Pipeline CP Retrofit Exercise
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

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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