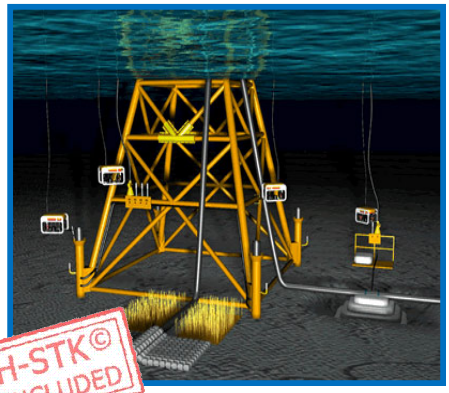
COURSE OVERVIEW OE0330
Integrity Management of Subsea Pipelines

Course Title
Integrity Management of Subsea Pipelines

Course Date/Venue
Session 1: April 28-May 02, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: October 26-30, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference
OE0330

3.0 CEUs (30 PDHs) AWARD

Course Duration/Credits
Five days/3.0 CEUs/30 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 is designed to provide delegates with a detailed and up-to-date overview of Integrity Management of Subsea Pipelines. It covers the philosophy of inspection, maintenance and repair (IMR); the types of risk assessment approach used in IMR; the various procedures employed in the inspection and repair of subsea pipelines; the corrosion issues such as seawater corrosion and corrosion under marine fouling and its recommended practices; and the subsea pipelines, particularly their construction and some case histories of problems encountered during pipeline construction.

Further, the course will also discuss the procedures of hydrotesting and its importance as an inspection tool; the concept of free span including the use of sidescan sonar and laser camera systems in evaluation and repair of free spans; the design of weight coatings, the impact of climate change on pipeline stability and additional provisions on bottom stability; the various subsea pipeline failures and different methods of repair of damaged subsea pipelines; and the concept of cathodic protection including the design codes, methods of CP surveying, analysis of data & coating condition.

During this interactive course, participants will learn the importance of surveying of cathodic protection system; the internal corrosion comprising its morphology, inspection, monitoring and evaluation; the various types of pigging and their features, functions and limitations; the statistical methods used in corrosion data evaluation and various procedures used in the prevention of corrosion; the method of cathodic protection retrofitting; and the calculation method to evaluate protection limits.

Course Objectives

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

- Apply and gain in-depth knowledge on subsea pipeline inspection and integrity management
- Discuss the philosophy of inspection, maintenance and repair (IMR) and become aware on the types of risk assessment approach used in IMR
- Identify the various procedures employed in the inspection and repair of subsea pipelines
- Determine all corrosion issues such as seawater corrosion & corrosion under marine fouling and explain its recommended practices
- Develop in-depth understanding of subsea pipelines, particularly their construction and list down some case histories of problems encountered during pipeline construction
- Employ the procedures of hydrotesting and recognize its importance as an inspection tool
- Acquire the concept of free span including the use of sidescan sonar and laser camera systems in evaluation and repair of free spans
- Explain on-bottom stability by describing the design of weight coatings, identifying the impact of climate change on pipeline stability and knowing the additional provisions on bottom stability
- Differentiate the various subsea pipeline failures and determine the different methods of repair of damaged subsea pipelines
- Familiarize with the concept of cathodic protection including the design codes, methods of CP surveying, analysis of data & coating condition and recognize the importance of surveying of cathodic protection system
- Describe internal corrosion comprising its morphology, inspection, monitoring and evaluation
- Identify the various types of pigging and explain their features, functions and limitations
- List down the statistical methods used in corrosion data evaluation and recognize the various procedures used in the prevention of corrosion
- Practice the method of cathodic protection retrofitting and demonstrate the calculation method to evaluate protection limits

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 subsea pipeline inspection and integrity management 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 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. Luis Manuel is a **Senior Offshore & Inspection Engineer** with over **35 years** of extensive and practical experience within the **Oil**, **Gas**, **Petrochemical** and **Petroleum** industries. His expertise includes **Oil & Gas Marine Terminals**, **Vessel Hull & Machinery Survey**, Oil & Gas Fields **Terminal** Operations, **Seamanship**, **Shipping** Overview, **Marine Fire Fighting** Equipment, **Hull Damage** Control, **Vessel Rescue**, **Life Saving**, **Safety Process**, **Offshore Marine** Operation Management, **Offshore** Survey, Oil & Gas Terminals Loading & Discharging, Performance Monitoring of Offshore Structures, **Offshore** Pipeline Global Buckling, **Offshore** Modular Units, **Offshore** Structure Design & Construction, **Offshore** Project Management, **Tanker Vetting** for Terminals, **Loading Master** Certification for Oil & Gas Terminals, **Port Terminals** Crisis Management & Major Emergency Response. Further he is also well versed in **ASME Post Construction Code**, **Inspection Planning**, **Fitness-for-Service** (**FFS**) (**API 579**), **Design**, **Inspection**, **Repair**, **Maintenance**, **Alteration** and **Reconstruction** of **Steel Storage Tanks** (**API-653**), **Positive Material Identification** (**API RP 578**), **Pressure Equipments** and **Pressure Vessels** (**ASME VIII & API-510**); **Tanker & Marine Terminals**, **Offshore Rig Inspection**, **Pipelines** & **Piping** Design, Inspection & Maintenance (**ASME B31**, **API 579** & **API 580**), **Pipelines & Manifolds System**, **Offshore Structure** Engineering, Single Buoy Mooring (**SBM**), **Underwater Inspection by ROV**, **Subsea Pipeline Engineering**, Integrity Assessment, Forensic Analysis, Structural Analysis, Design & Engineering, Naval Architecture, Regulatory Compliance Inspections, **Stress & Fatigue Analysis** using **SACS**, **StruCad**, **Caesar II** and **Finite Element Analysis** simulators. He was the **Technical Advisor** and **Engineering Manager** of a leading international engineering firm where he led all Inspections, Structural Engineering and Pipeline Projects for **Total-ELF**, **Shell** and **Mobil**.

During his career life, Mr. Manuel has gained his thorough practical experience in **multiple engineering disciplines** that includes pipeline/piping inspection and engineering, naval engineering, container cargo lashing, aerospace engineering and offshore structural engineering (oil and gas exploration platforms) through several challenging positions such as the **Senior Pipelines Engineer**, **Senior Piping Engineer**, **Senior & Lead Structural Engineer**, **Staff Engineer**, **Offshore Project Manager**, **Naval Architect** and **Applications Engineer** for various international companies including **Chevron**, **ExxonMobil**, **Addax Petroleum**, **ZAGOC**, **NASSCO**, DWC, Point Engineering, **US ARMY**, W.S. & Atkins, Atlas Engineering, **Heerema Offshore**, Casbarian Engineering Associates (CEA), Textron Marine, Ingalls Shipbuilding and Peck & Hale. Further, he has been heavily involved in the development of fabrication and erection drawings for offshore structures including installation and rigging as well as in the instruction materials as authorized by EDI (**Engineering Dynamic Incorporated**) for the training of engineers on the Structural Analysis Computer System (**SACS**) software.

Mr. Manuel has a **Bachelor's** degree in **Structural & Marine Engineering** from the **State University of New York**. Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**), a **Certified Instructor/Trainer** and the **author** of the book "**Offshore Platforms Design**" and the "**SACS Software Training Module**".

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$ 8,000 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 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 to Integrity, Inspection, Maintenance and Repair (IMR)*** *Risk Assessment Approach • IMR Philosophy • Priorities • Corrosion Risk Assessments • Qualitative and Quantitative Approaches.*
0930 – 0945	*Break*
0945 – 1100	***Risk Assessment Exercise***
1100 – 1230	***Corrosion Issues*** *Design Codes • Recommended Practices • Seawater Corrosion • Corrosion Under Marine Fouling • Interactions Between Pipelines and Jackets • Coatings and Cathodic Protection*
1230 – 1245	*Break*
1245 – 1420	***Pipelines Overview*** *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*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0900	***Construction Issues*** *Case Histories of Problems Encountered During Pipeline Construction*
0900 – 0930	*Break*
0930 – 1100	***Hydrotesting*** *Initial Hydrotesting Philosophy • Use of Hydrotesting as an Inspection Tool • Golden Welds and Flange Connections • Flexible Pipe*
1100 – 1215	***Spans*** *Use of Sidescan Sonar • Laser Camera Systems • Evaluation of Spans • Repair of Spans • Control of Vortex-Induced Vibration*
1215 – 1230	*Break*
1230 – 1330	***Spans Assessment Exercise***
1330 – 1420	***Discussion of Conclusions of Assessment Exercise***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***On-Bottom Stability*** *Design of Weight Coatings • Impact of Weather/Climate Change on Pipeline Stability • Provision of Additional on Bottom Stability • Case studies*
0830 – 0930	***On-Bottom Stability Design Exercise***
0930 – 1100	*Break*
1100 – 1215	***Pipeline Failure Case Histories*** *Case Histories of Pipeline Failures*
1215 – 1230	***Pipeline Failure Case Histories (cont'd)*** *How Identified, Repair Procedures Used, Alternative Options*
1230 – 1330	*Break*
1330 – 1420	***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*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Repair Design Exercise***
0830 – 0930	***Cathodic Protection*** *Design Codes • Methods of Cp Surveying • Video Surveys • Analysis of The Data • Coating Condition Evaluation From Cp Surveys*
0930 – 0945	*Break*
0945 – 1045	***Internal Corrosion*** *Corrosion Morphology • Risk Based Inspection Methodology • Monitoring of Internal Corrosion • Use of Chemical Analysis • Microbiological Evaluations • Evaluation of Pigging Debris*
1045 – 1200	***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*
1200 – 1215	*Break*

1215 – 1315	***Intelligent Pigging*** *Magnetic Flux Pigs • Ultrasonic Pigs • Special Pigs for Cracking, Longitudal Defects, Heavy Schedule Pipe (Thick Wall) • Preparation for Intelligent Pigging*
1315 – 1420	***Intelligent Pigging Assessment Exercise***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0900	***Corrosion Data Evaluation*** *Statistical Methods • Trend Analysis • Qualitative and Semi-Quantitative Corrosion Risk Assessments • ASME B31G and other Defect Assessment Techniques*
0900 – 0915	*Break*
0915 – 1015	***Corrosion Data Evaluation Exercise***
1015 – 1115	***Prevention of Corrosion*** *Corrosion Inhibition • Evaluation of Corrosion Inhibitors by Laboratory Testing • Field Testing of Inhibitors • Biocide Evaluation • Field Testing of Biocides*
1115 – 1215	***Cathodic Protection Retrofitting*** *Retrofitting to Structures • Impressed Current Systems • Retrofitting on Pipelines Using Rafts • Calculation Methods to Evaluate Protection Limits*
1215 – 1230	*Break*
1230 – 1345	***Pipeline CP Retrofit Exercise***
1345 – 1400	***Course Conclusion***
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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