



COURSE OVERVIEW DE0489 **Directional and Horizontal Drilling** **(E-Learning Module)**

Course Title

Directional and Horizontal Drilling
(E-Learning Module)

Course Reference

DE0489

Course Format & Compatibility

SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration

30 online contact hours
(3.0 CEUs/30 PDHs)

Course Description



This E-Learning course is designed to provide participants with a detailed and up-to-date overview of directional and horizontal drilling. It covers TVD interpretation, polar, rectangular coordinates, dogleg severity and the problems associated with it; torque and drag interpretation and identification of factors affecting those in the drilling process; the main concepts associated to well path planning; the suitable measures to mitigate operational issues related to directional and horizontal drilling; the main concepts associated to well construction of multilateral wells; and the installation and feasibility considerations that include technical feasibility, site evaluation, subsurface stratification, site characterization, economic feasibility and cost estimating.

During this course, participants will learn the HDD technology and equipment, HDD rigs, small (mini) rigs, medium (midi) rigs, large (maxi) rigs, HDD down-hole equipment, drill bits, down-hole tools, drill pipe and drilling fluid systems; basic HDD design, HDD project design considerations, drill-path design and pipe stress criteria; the directional accuracy, tolerances and the product pipe considerations; the multiple pipe installations and machine size selection; the installation basics, work plan and other considerations; HDD installation, drilling fluid system and quantity estimating calculations; project contract documents, plans, specifications and contractor proposal/bid; site evaluation and preconstruction; and the site restoration, HDD risk identification and HDD stress analysis for steel product pipe.



Course Objectives

After completing the course, the employee will:-

- Apply and gain a comprehensive knowledge on directional and horizontal drilling
- Interpret TVD, polar, rectangular coordinates, dogleg severity and the problems associated with it.
- Interpret torque and drag and what factors affect those in the drilling process
- Understand main concepts associated to well path planning
- Recommend suitable measures to mitigate operational issues related to directional and horizontal drilling
- Understand main concepts associated to well construction of multilateral wells
- Discuss installation and feasibility considerations that include technical feasibility, site evaluation, subsurface stratification, site characterization, economic feasibility and cost estimating
- Recognize HDD technology and equipment, HDD rigs, small (mini) rigs, medium (midi) rigs, large (maxi) rigs, HDD down-hole equipment, drill bits, down-hole tools, drill pipe and drilling fluid systems
- Illustrate basic HDD design, HDD project design considerations, drill-path design and pipe stress criteria
- Determine directional accuracy and tolerances as well as discuss the product pipe considerations
- Carryout multiple pipe installations and machine size selection
- Apply installation basics, work plan and other considerations
- Employ HDD installation and apply drilling fluid system and quantity estimating calculations
- Review project contract documents, plans, specifications and contractor proposal/bid
- Perform site evaluation and preconstruction as well as postconstruction evaluation
- Demonstrate site restoration, HDD risk identification and HDD stress analysis for steel product pipe

Who Should Attend


This course provides an overview of all significant aspects and considerations of directional and horizontal drilling for drilling engineers, field engineers, petroleum engineers, supervisors, directional drillers and other technical staff from work-over and other company staff involved in directional, horizontal and sidetracking drilling.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

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USA International Association for Continuing Education and Training (IACET)

Haward Technology is an Authorized Training Provider by the International Association 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 1-2013 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 1-2013 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 Association 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.

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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

As per proposal

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Contents

- Introduction to Horizontal Directional Drilling
- History
- Applications
- Pipeline
- Utilities
- HDD Process
- Pipe Installation
- Installation and Feasibility Considerations
- Technical Feasibility
- Site Evaluation
- Subsurface Stratification
- Site Characterization Study
- Economic Feasibility
- Cost Estimating
- HDD technology and Equipment
- HDD Rigs
- Small (Mini) Rigs
- Medium (Midi) Rigs
- Large (Maxi) Rigs

- HDD Down-Hole Equipment
- Drill Bits
- Down-Hole Tools
- Drill Pipe
- Drilling Fluid Systems
- HDD Design
- HDD Design Basic
- HDD Project Design Considerations
- Drill-Path Design
- Pipe Stress Criteria
- Directional Accuracy and Tolerances
- Product-Pipe Considerations
- Multiple Pipe Installations
- Machine Size Selection
- Other Considerations
- HDD Installation
- Installation Basics
- Work Plan
- Drilling Fluid System
- Drilling Fluids
- Additives
- Soil Conditions
- Quantity Estimating Calculations
- Project Contract Documents, Plans, And Specifications
- Risk Mitigation
- Contractor Proposal/Bid
- Site Evaluation
- Preconstruction
- Drilling Operations
- Site Restoration and Postconstruction Evaluation
- HDD Risk Identification
- HDD Stress Analysis for Steel Product Pipe
- General Information
- Steel Product-Pipe Stress Analysis

- Installation
- Calculating Operating Loads and Stresses
- HDD Pipe Stress Analysis for Plastic Pipe
- Bore-Path Profile
- Bore-Path Geometry for Plastic Pipe
- Pullback Loads
- Frictional Resistance
- Pulling Force
- Hydrokinetic Pressure
- Axial Tensile Stress
- HDD Tracking and Surveying
- HDD Tracking
- Walkover System
- Wireline System
- Interference and HDD Location Systems
- Surveying in Rock Formations
- Surveying Water Crossings
- HDD Survey
- Bore-Profile Calculations
- Construction Monitoring
- HDD Contracts
- Turnkey Contracts
- Footage Contracts
- Daywork Contracts
- Risk Sharing
- Costs
- Unknown Subsurface Condition Risk
- Technical Specifications and Drawings