COURSE OVERVIEW DE0184
Directional Drilling, Horizontal and Sidetracking

Course Title
Directional Drilling, Horizontal and Sidetracking

Course Date/Venue
September 08-12, 2024/ Boardroom, Warwick Hotel Doha, Doha, Qatar

Course Reference
DE0184

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 good working knowledge on directional drilling, horizontal and sidetracking. Design considerations and operational aspects of directional and horizontal drilling will be highlighted in the course. The course will increase the understanding of the operations carried out by directional drillers and how directional and horizontals wells are planned and optimized. The basic applications and techniques for multilateral wells are also covered in the course.

The course will provide participants with necessary skills to plan and execute the drilling of directional and horizontal wells. It emphasizes the planning of well paths with single and multiple targets and selection of appropriate bottomhole assembly and drillstring for a given well path trajectory. The course also provides several opportunities for hands-on computer sessions for analyzing directional planning and simulating directional drilling process.

Specific problems associated with directional/horizontal drilling such as torque, drag, hole cleaning, logging, and drill string component design are included. Participants will receive instruction on planning and evaluating horizontal wells based on the objectives of the horizontal well. The basic applications and techniques for multi-lateral wells are covered in the course. Additionally, they will become familiar with the tools and techniques used in directional drilling such as survey instruments, bottomhole assemblies, motors, steerable motors, and steerable rotary systems. Participants will be able to predict wellbore path based on historical data and determine the requirements to hit the target.

Course Objectives

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

- Apply and gain an in-depth knowledge on directional drilling, horizontal and sidetracking
- 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 directional profiles and other applications of directional drilling
- Carryout directional drilling methodologies and techniques, directional and horizontal drilling, side tracking, inaccessible location and offshore development drilling
- Recognize dry hot rock development, low permeability and heterogeneous reservoirs and water and gas coning
- Employ horizontal drilling methods and applications, plan directional and horizontal wells including extended reach wells (ERD) and apply directional well planning and navigation
- Plan and design optimum well-path trajectory, as well as implement the methods of calculating well-path trajectory from survey points and its presentation in 3D coordinate system
- Identify the operating principles and applications of surveying equipment
- Apply planning torque and drag calculations as well as dogleg, torque and drag calculations
- Implement hole cleaning practices in deviated and horizontal wells as well as multi-lateral wells concepts and application
- Identify the deflecting and drilling tools and methods and the factors controlling bit deflection
- Recognize the equipment and methods to kick off the well and control deviation

- Apply drillstring configuration with respect to long radius, short radius, ultra short radius and stabilizer configuration
- Illustrate drillstring design for directional control, calculate side forces and lead angle (building or dropping tendency) of the bit and determination of the shape of the string for a given bottomhole configuration
- Determine performance analysis of single versus multiple stabilizer bottomhole assembly
- Design bottomhole assembly for build-up, slant and drop-off sections of the well trajectory

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 directional, horizontal and sidetracking 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.

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$ 8,500 per Delegate. 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 **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.

- 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:

Dr. Chris Kapetan, PhD, MSc, is a **Senior Petroleum Engineer** with over **30 years** of international experience within the **onshore** and **offshore oil** & **gas** industry. His wide experience covers **Decision Analytic Modelling Methods** for **Economic Evaluation**, **Probabilistic Risk Analysis** (**Monte Carlo Simulator**) **Risk Analysis Foundations**, **Global Oil Demand**, in Electrical Submersible Pumps Application, **ESP** Assembly & Disassembly Techniques, **ESP** Modeling & Design, **ESP** Construction & Operational Monitoring, **ESP** Troubleshooting & Maintenance, Crude Oil Market, Global Oil Reserves, Oil Supply & Demand, Governmental Legislation, Contractual Agreements, **Financial** Modeling, **Oil Contracts**, **Project Risk Analysis**, **Feasibility Analysis** Techniques, **Capital Operational Costs**, Oil & Gas Exploration Methods, **Reservoir** Evaluation, **Extraction of Oil & Gas**, **Crude** Oil Types & Specifications, Sulphur, Sour Natural Gas, **Natural Gas Sweeting**, **Petroleum Production**, Field Layout, **Production** Techniques & Control, **Surface Production** Operations, **Oil Processing**, Oil Transportation-Methods, **Flowmetering & Custody Transfer** and **Oil Refinery**. Further, he is also well-versed in Enhanced Oil Recovery (**EOR**), Electrical Submersible Pumps (**ESP**), **Oil Industries Orientation**, **Geophysics**, Cased Hole **Formation Evaluation**, Cased Hole **Applications**, Cased Hole **Logs**, Production **Operations**, Production **Management**, Perforating **Methods & Design**, Perforating **Operations**, **Fishing** Operations, **Well & Reservoir** Testing, **Reservoir Stimulation**, **Hydraulic Fracturing**, **Carbonate** Acidizing, **Sandstone** Acidizing, **Drilling Fluids Technology**, Drilling **Operations**, **Directional** Drilling, **Artificial Lift**, **Gas Lift Design**, **Gas Lift Operations**, **Petroleum Business**, **Petroleum Economics**, **Field Development Planning**, **Gas Lift Valve** Changing & Installation, **Well Completion** Design & Operation, Well **Surveillance**, Well **Testing**, Well **Stimulation** & **Control** and **Workover Planning**, **Completions** & **Workover**, **Rig Sizing**, **Hole Cleaning** & **Logging**, **Well Completion**, **Servicing** and **Work-Over Operations**, Practical **Reservoir Engineering**, **X-mas Tree & Wellhead** Operations, Maintenance & Testing, **Advanced Petrophysics/Interpretation** of **Well Composite**, **Construction Integrity** & **Completion**, **Coiled Tubing Technology**, **Corrosion Control**, **Slickline**, **Wireline & Coil Tubing**, **Pipeline Pigging**, **Corrosion Monitoring**, **Cathodic Protection** as well as Root Cause Analysis (**RCA**), Root Cause Failure Analysis (**RCFA**), **Gas Conditioning & Process Technology**, **Production Safety** and **Delusion of Asphalt**. Currently, he is the **Operations Consultant** & the **Technical Advisor** at **GEOTECH** and an independent **Drilling Operations Consultant** of various engineering services providers to the international clients as he offers his expertise in many areas of the **drilling & petroleum discipline** and is well **recognized & respected** for his process and procedural expertise as well as ongoing participation, interest and experience in continuing to promote technology to producers around the world.

Throughout his long career life, Dr. Chris has worked for many international companies and has spent several years **managing** technically **complex wellbore interventions** in both **drilling** & **servicing**. He is a **well-regarded** for his **process** and **procedural expertise**. Further, he was the **Operations Manager** at **ETP Crude Oil Pipeline Services** where he was fully responsible for optimum operations of crude oil pipeline, **workover** and **directional drilling**, **drilling rigs** and equipment, drilling of various geothermal deep wells and **exploration wells**. Dr. Chris was the **Drilling** & **Workover Manager** & **Superintendent** for **Kavala Oil** wherein he was responsible for supervision of **drilling operations** and **offshore exploration**, quality control of performance of **rigs**, **coiled tubing**, crude oil transportation via pipeline and abandonment of **well** as per the API requirements. He had occupied various key positions as the **Drilling Operations Consultant**, **Site Manager**, **Branch Manager**, **Senior Drilling** & **Workover Manager** & **Engineer** and **Drilling** & **Workover Engineer**, **Operations Consultant**, **Technical Advisor** in several petroleum companies responsible mainly on an **offshore** sour oil field (under water flood and gas lift) and a gas field. Further, Dr. Chris has been a **Professor** of the **Oil Technology College**.

Dr. Chris has **PhD** in **Reservoir Engineering** and a **Master** degree in **Drilling & Production Engineering** from the **Petrol-Gaze Din Ploiesti University**. Further, he is a **Certified Surfaced BOP Stack Supervisor** of **IWCF**, a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**) and has conducted **numerous short courses**, **seminars** and **workshops** and has published several technical books on **Production Logging**, **Safety Drilling Rigs** and **Oil Reservoir**.

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: ***Sunday, 08th of September 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Directional Profiles & Other Applications of Directional Drilling***
0930 – 0945	*Break*
0945 – 1030	***Directional Drilling Methodologies & Techniques***
1030 – 1100	***Application of Directional & Horizontal Drilling***
1100 – 1130	***Side Tracking***
1130 – 1200	***Inaccessible Locations***
1200 – 1215	*Break*
1215 – 1300	***Offshore Development Drilling***
1300 - 1420	***Dry Hot Rock Development***
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday 09th of September 2024***

0730 – 0830	***Low Permeability & Heterogeneous Reservoirs***
0830 – 0930	***Water & Gas Coning***
0930 – 0945	*Break*
0945 – 1030	***Horizontal Drilling Methods & Applications***
1030 – 1100	***Planning Directional & Horizontal Wells Including Extended Reach Wells (ERD)***
1100 – 1200	***Directional Well Planning & Navigation***
1200 – 1215	*Break*
1215 – 1330	***Planning & Design of the Optimum Well-Path Trajectory***
1330 -1420	***Methods of Calculating Well-Path Trajectory from Survey Points & its Presentation in 3D Coordinate System***
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Tuesday 10th of September 2024***

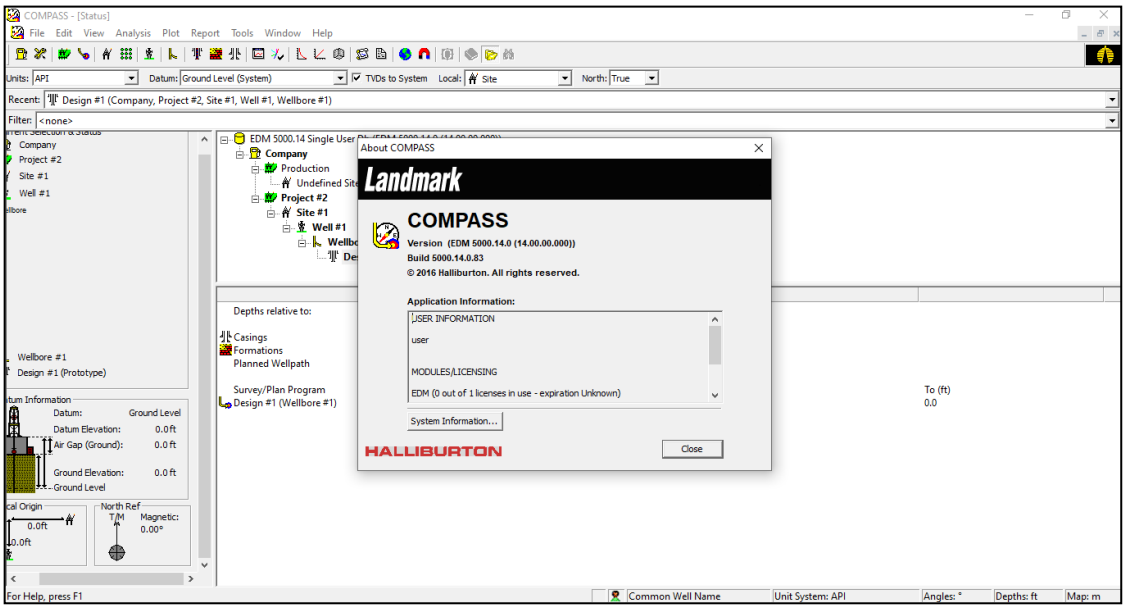
0730 – 0830	***Operating Principles & Applications of Surveying Equipment***
0830 – 0930	***TVD, Polar, Rectangular Coordinates, Dogleg Severity & The Problems Associated with it***
0930 – 0945	*Break*
0945 – 1030	***Planning Torque & Drag Calculations***
1030 – 1100	***Dogleg, Torque & Drag Calculations***
1100 – 1115	*Break*
1115 – 1300	***Torque & Drag & What Factors Affect Those in the Drilling Process***
1300 - 1420	***Main Concepts Associated with Well Path Planning***
1420 - 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4:	Wednesday, 11th of September 2024
0730 – 0830	***Hole Cleaning Practices in Deviated & Horizontal Wells***
0830 – 0930	***Multi-lateral Wells Concepts & Application***
0930 – 0945	*Break*
0945 – 1030	***Measures to Mitigate Operational Issues Related to Directional & Horizontal Drilling***
1030 – 1100	***Deflecting & Drilling Tools & Methods***
1100 – 1115	*Break*
1115 – 1300	***Factors Controlling Bit Deflection***
1300 - 1420	***Equipment & Methods to Kick Off the Well & Control Deviation***
1420 - 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5:	Thursday, 12th of September 2024
0730 – 0900	***Drillstring Configuration with Respect to Long Radius, Short Radius & Ultra Short Radius & Stabilizer Configuration***
0900 – 1030	***Drillstring Design for Directional Control***
1030 – 1045	*Break*
1045 – 1130	***Calculation of Side Forces & Lead Angle (Building or Dropping Tendency) of the Bit & Determination of the Shape of the String for a Given Bottomhole Configuration***
1130 – 1230	***Performance Analysis of Single Versus Multiple Stabilizer Bottomhole Assembly***
1230 – 1300	***Design of Bottomhole Assembly for Build-Up, Slant & Drop-Off Sections of the Well Trajectory***
1300 - 1315	*Break*
1315 – 1345	***Well Construction of Multilateral Wells***
1345 - 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulators (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 our state-of-the-art simulator "COMPASS" software.



COMPASS

Course Coordinator

Jaryl Castillo, Tel: +974 4423 1327, Fax: +974 4423 1100, Email: jaryl@haward.org