COURSE OVERVIEW DE1084
Drilling Engineer: Drilling Efficiency, Problem Solving & Optimization Techniques

Course Title
Drilling Engineer: Drilling Efficiency, Problem Solving & Optimization Techniques

Course Date/Venue
October 27-31, 2025/Boardroom Meeting Room, The Rubens at the Palace, London, UK

Course Reference
DE1084

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive workshop 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 Drilling Engineer: Drilling Efficiency, Problem Solving and Optimization Techniques. It covers the drilling efficiency, well planning and design for efficiency, drill bit selection and hydraulics; the drill string and bottom hole assembly (BHA) design, mud systems and hole cleaning and rig selection and equipment capabilities; the real-time data acquisition, drilling performance metrics and visualization and analytics tools; the downhole dynamics and vibration analysis, drilling hydraulics monitoring; and the drill bit tracking and optimization.

Further, the course will also discuss the structured problem-solving techniques, stuck pipe and hole problems and well control and kick management; the wellbore stability challenges, torque and drag optimization and cementing and well integrity issues; and the automated drilling systems, predictive analytics and machine learning and pressure management strategies.

During this interactive course, participants will learn the rig power consumption monitoring, fuel optimization and emissions reduction, water usage and cuttings disposal and regulatory compliance and reporting; the rotary steerable systems versus mud motors, real-time downhole tool adjustments, high-temperature, high-pressure tool selection and novel drilling fluids; the value stream mapping of drilling operations, eliminating non-value-added activities, standard operating procedures and checklists and continuous improvement culture; the risk management and safety integration; and the implementation roadmap and change management.

Course Objectives

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

- Get certified as a "*Certified Drillling Engineer*"
- Discuss drilling efficiency, well planning and design for efficiency, drill bit selection and hydraulics
- Illustrate drill string and bottom hole assembly (BHA) design, mud systems and hole cleaning and rig selection and equipment capabilities
- Recognize real-time data acquisition, drilling performance metrics and visualization and analytics tools
- Carryout downhole dynamics and vibration analysis, drilling hydraulics monitoring and drill bit tracking and optimization
- Employ structured problem-solving techniques, identify stuck pipe and hole problems and apply well control and kick management
- Identify wellbore stability challenges, apply torque and drag optimization and describe cementing and well integrity issues
- Recognize automated drilling systems, predictive analytics and machine learning and pressure management strategies
- Apply rig power consumption monitoring, fuel optimization and emissions reduction, water usage and cuttings disposal and regulatory compliance and reporting
- Identify rotary steerable systems versus mud motors, real-time downhole tool adjustments, high-temperature, high-pressure tool selection and novel drilling fluids
- Illustrate value stream mapping of drilling operations, eliminating non-value-added activities, standard operating procedures and checklists and continuous improvement culture
- Apply risk management and safety integration as well as implementation roadmap and change management

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 covers systematic techniques on drilling efficiency, problem solving and optimization techniques for drilling engineers, well engineers and well planners, drilling supervisors, toolpushers, operations engineers involved in well delivery, field engineers, drilling superintendents and managers, technical support staff in drilling departments, project engineers responsible for drilling operations, contract engineers overseeing drilling services, HSE professionals working closely with drilling operations 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

US$ 8,800 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.

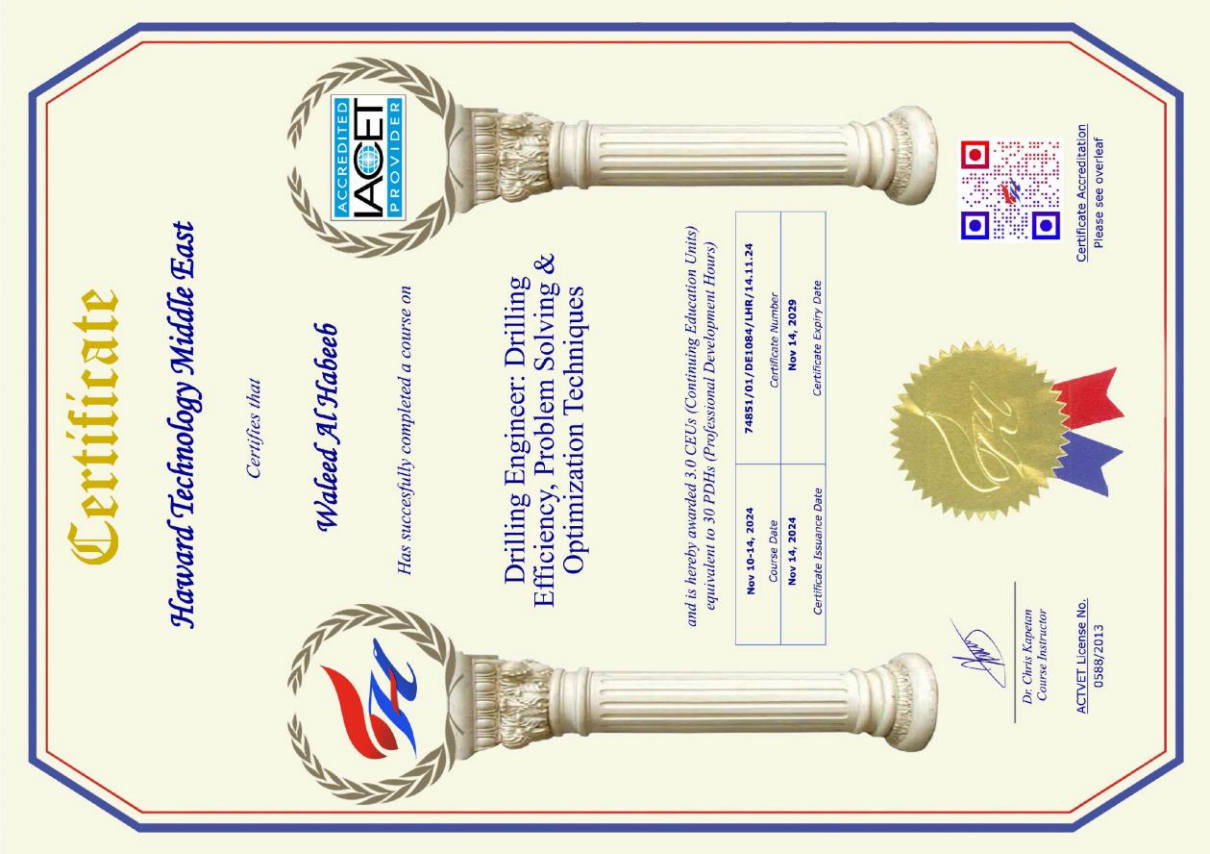
Course Certificate(s)

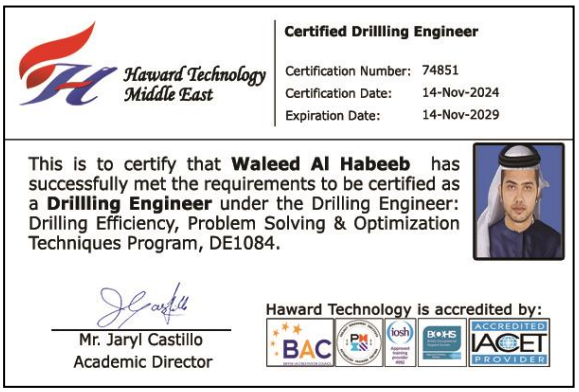
(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Successful candidate will be certified as a "*Certified Drilling Engineer*". Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-





(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Nov-24

HTME No. 74851

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
DE1084	Drilling Engineer: Drilling Efficiency, Problem Solving & Optimization Techniques	Nov 10-14, 2024	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Jaryl Castillo
Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2018 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2018 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 is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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:

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 **Asset Management** Principles, Risks & Economics, **Petroleum Economics**, **Decision Analytic Modelling Methods** for **Economic Evaluation**, **Probabilistic Risk Analysis** (**Monte Carlo Simulator**) **Risk Analysis Foundations**, **Global Oil Demand**, 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**, **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's** 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: ***Monday, 27th of October 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Drilling Efficiency*** *Defining ROP (Rate of Penetration) & its Importance • Key Performance Indicators (KPIs) in Drilling • Cost Per Foot & its Drivers • Benchmarking Against Industry Best Practices*
0930 – 0945	*Break*
0945 – 1030	***Well Planning & Design for Efficiency*** *Borehole Trajectory Optimization (Vertical versus Directional) • Hole Section Sizing & Casing Program • Geomechanical Considerations (Stress Regimes, Rock Strength) • Formation Evaluation Inputs to Drilling Design*
1030 – 1130	***Drill Bit Selection & Hydraulics*** *Types of Drill Bits & Their Applications (PDC, Roller Cone, Hybrid) • Bit Hydraulics: Optimizing Nozzles & Flow Rates • Erosion & Bit Life Management • Hydraulics Modeling & Pressure Loss Calculation*
1130 – 1230	***Drill String & Bottom Hole Assembly (BHA) Design*** *BHA Components & their Roles (Stabilizers, Jars, Subs) • String Configuration for Directional Control versus Efficiency • Vibration Mitigation Through BHA Tuning • Torque & Drag Considerations*
1230 - 1245	*Break*
1245 - 1330	***Mud Systems & Hole Cleaning*** *Properties of Drilling Fluids Affecting ROP (Viscosity, Density) • Solids Control Equipment & Practices • Cuttings Transport Theory & Cleaning Optimization • Fluid Loss Control & Wellbore Stability*
1330 - 1420	***Rig Selection & Equipment Capabilities*** *Matching Rig Horsepower & Torque to Well Requirements • Top Drive versus Rotary Table Efficiencies • Automated Drilling Systems Overview • Maintenance Practices for Minimizing Downtime*
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: ***Tuesday, 28th of October 2025***

0730 – 0845	***Real Time Data Acquisition*** *Surface Parameters (Weight on Bit, Rotary Speed, Pump Pressure) • Down-Hole Telemetry Systems (MWD, LWD) • Data Quality & Communications Challenges • Integration of Multi Source Data*
0845 – 0930	***Drilling Performance Metrics*** *Mechanical Specific Energy (MSE) Calculation • Drilling Efficiency Ratio (DER) & Drilling Depreciation Ratio (DDR) • Six Sigma & Statistical Process Control for Drilling • Automated KPI Dashboards*

0930 – 0945	Break
0945 – 1100	***Visualization & Analytics Tools*** *Commercial & In-House Software Platforms • Trend Analysis for Proactive Decision Making • Custom Scripting & Data Mining Techniques • Alert Thresholds & Anomaly Detection*
1100 - 1230	***Downhole Dynamics & Vibration Analysis*** *Identification of Stick-Slip, Whirl & Bit Bounce • Sensor Placement & Signal Processing • Mitigation Strategies (BHA Changes, Flow Adjustments) • Case Examples of Vibration-Induced Inefficiencies*
1230 – 1245	Break
1245 – 1330	***Drilling Hydraulics Monitoring*** *Real Time Pressure & Flow Modelling • Identifying & Diagnosing Hydraulic Restrictions • Dynamic Kill & Circulating Procedures • Use of Distributed Pressure Sensors*
1330 - 1420	***Drill Bit Tracking & Optimization*** *Bit Run Reporting & Life Cycle Tracking • Bit Steering versus Bit Efficiency Trade-Offs • Bit Performance Prediction Models • Continuous Improvement through Post-Job Reviews*
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: ***Wednesday, 29th of October 2025***

0730 – 0845	***Structured Problem-Solving Techniques*** *PDCA (Plan-Do-Check-Act) Cycle in Drilling Context • Root Cause Analysis (5 Whys, Fishbone Diagrams) • Failure Mode & Effects Analysis (FMEA) • Lessons Learned Databases*
0845 – 0930	***Stuck Pipe & Hole Problems*** *Types of Stuck Pipe Incidents & Causes • Prevention Strategies (Spotting Fluids, Torque Management) • Free-Point Determination & Fishing Basics • Case Study: Successful Stuck-Pipe Recovery*
0930 – 0945	Break
0945 – 1100	***Well Control & Kick Management*** *Early Detection of Kicks Using Drilling Parameters • Shut-in & Kill Procedures • Circulation versus Bleed Off Methods • Pressure Management in Depleted or Fractured Zones*
1100 - 1230	***Wellbore Stability Challenges*** *Identifying Instability Risks (Shales, Washes, Losses) • Drilling Window Determination • Loss-Circulation Material (LCM) Selection & Placement • Borehole Strengthening Techniques*
1230 – 1245	Break
1245 – 1330	***Torque & Drag Optimization*** *Calculating Expected Torque & Drag • Friction Factor Measurement • Use of Lubricants & Friction Reducers • Model Validation with Down Hole Data*

1330 - 1420	***Cementing & Well Integrity Issues*** *Cement Slurry Design for Efficient Zonal Isolation • Mud Removal & Centralization Best Practices • Cement Placement Verification (Tags, Pressure Tests) • Remedial Cementing Techniques*
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: Thursday, 30th of October 2025

0730 – 0845	***Automated Drilling Systems*** *Closed Loop Drilling Control Fundamentals • Surface Automation (Auto ROP, WOB Control) • Downhole Automation (Drilling Jars, Toolface Control) • Human-Machine Interface & Change Management*
0845 – 0930	***Predictive Analytics & Machine Learning*** *Data Preprocessing for Model Training • Common ML Algorithms in Drilling (Regression, Clustering) • Predictive Maintenance of Drilling Equipment • Implementation Challenges & Success Factors*
0930 – 0945	*Break*
0945 – 1100	***Pressure Management Strategies*** *Managed Pressure Drilling (MPD) Techniques • Dual-Gradient Drilling Advantages • Surface Back-Pressure Control • Case Study: MPD Efficiency Gains*
1100 - 1230	***Energy Management & Environmental Considerations*** *Rig Power Consumption Monitoring • Fuel Optimization & Emissions Reduction • Water Usage & Cuttings Disposal • Regulatory Compliance & Reporting*
1230 – 1245	*Break*
1245 – 1330	***Advanced BHA & Tool Innovations*** *Rotary Steerable Systems versus Mud Motors • Real-Time Downhole Tool Adjustments • High-Temperature, High-Pressure Tool Selection • Novel Drilling Fluids (Nanoparticle Additives, Polymers)*
1330 - 1420	***Operational Excellence & Lean Drilling*** *Value Stream Mapping of Drilling Operations • Eliminating Non-Value-Added Activities • Standard Operating Procedures & Checklists • Continuous Improvement Culture*
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 Four*

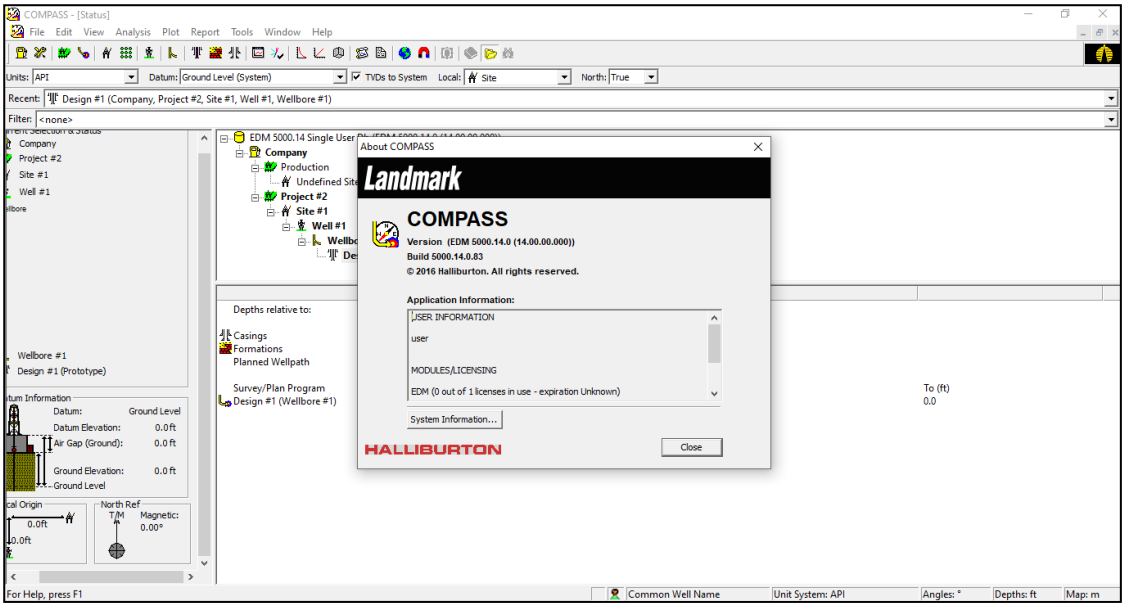
Day 5: Friday, 31st of October 2025

0730 – 0845	***Comprehensive Well Efficiency Case Studies*** *Onshore versus Offshore Drilling Efficiency Comparisons • High-Angle & Horizontal Well Optimization • Deepwater Drilling Performance Lessons • Cost-Benefit Analysis of Efficiency Projects*
0845 – 0930	***Simulation & Digital Twin Applications*** *Building a Digital Twin of the Drilling System • Scenario Testing & what if Analysis • Integrating Real Time Data for Live Simulation • Measuring ROI from Digital Twin Projects*

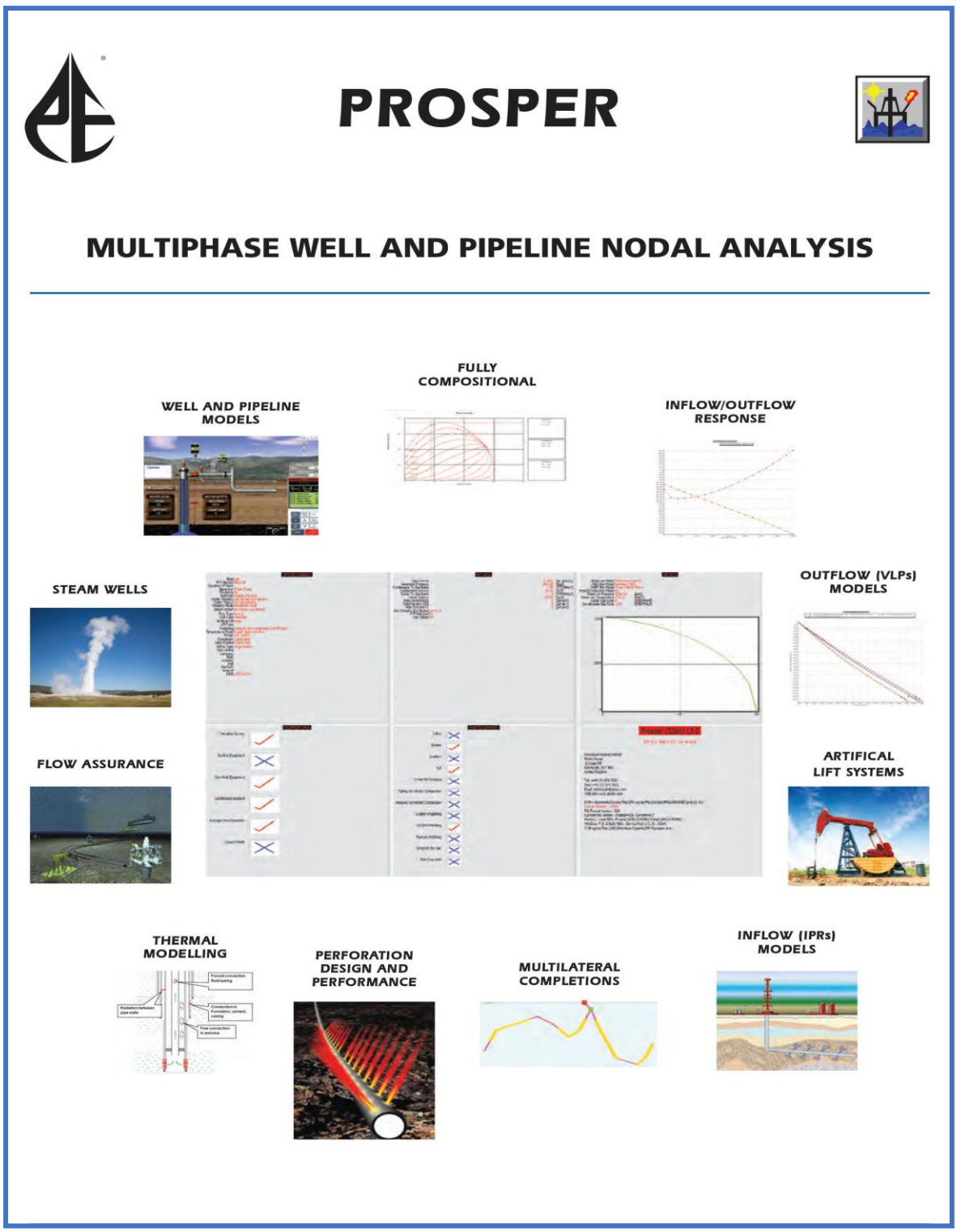
0930 – 0945	*Break*
0945 – 1100	***Project Workshops & Hands-On Exercises*** *Group Exercise: Identify & Solve a Drilling Inefficiency • Use of Simulators for Real Time Optimization Drills • Developing Action Plans & Presenting Solutions • Peer Review & Facilitator Feedback*
1100 - 1230	***Risk Management & Safety Integration*** *Linking Efficiency Gains with HSE Performance • Safety Risk Assessments for Optimization Changes • Emergency Response Planning in Optimized Operations • Ensuring Regulatory & Stakeholder Alignment*
1230 – 1245	*Break*
1245 – 1300	***Implementation Roadmap & Change Management*** *Phased Rollout of Optimization Initiatives • Stakeholder Engagement & Training Plans • KPI Tracking & Governance Structures • Sustaining Improvements through Audits*
1300 - 1315	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1315 – 1415	***COMPETENCY EXAM***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulators (Hands-on Practical Sessions)

Practical sessions will be organized during the workshop for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using one of our state-of-the-art simulators "COMPASS" and "PROSPER" software.



COMPASS



Course Coordinator
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