COURSE OVERVIEW DE1088
High-Angle & Extended Reach Drilling

Course Title
High-Angle & Extended Reach Drilling

Course Date/Venue
September 22-26, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE1088

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 High-Angle & Extended Reach Drilling. It covers the fundamentals of directional drilling, well planning principles for HADR/ERD and geomechanics and borehole stability; the measurement methods, survey error models, anti-collision planning, dogleg severity and toolface orientation; the drilling tools and BHA design and well trajectory design and planning; and the torque and drag modeling, casing and liner design in ERD and drillstring design for extended reach.

Further, the course will also discuss the hydraulic optimization in long-reach wells and hole cleaning in high-angle wells; managing ECD and pressure control; the drilling fluids for HADR/ERD including reaming, backreaming and wiper trips; the lost circulation and stuck pipe prevention, real-time monitoring and decision making; the casing running in long-reach wells, cementing design for high-angle wells and wellbore cleaning and displacement; and the liner installation, hanger selection and completion strategies in ERD wells.

During this interactive course, participants will learn the HSE challenges in high-angle operations, ERD risk identification and mitigation including drilling troubleshooting in HADR/ERD; the types and causes of vibration, modeling and monitoring tools, downhole tools for vibration reduction and surface parameter adjustments; and the best practices in ERD execution, cost analysis and economic considerations.

Course Objectives

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

- Apply and gain an in-depth knowledge on high-angle and extended reach drilling
- Discuss the fundamentals of directional drilling, well planning principles for HADR/ERD and geomechanics and borehole stability
- Carryout measurement methods, survey error models, anti-collision planning and dogleg severity and toolface orientation
- Identify drilling tools and BHA design and apply well trajectory design and planning
- Illustrate torque and drag modeling, casing and liner design in ERD and drillstring design for extended reach
- Carryout hydraulic optimization in long-reach wells and hole cleaning in high-angle wells
- Manage ECD and pressure control and determine drilling fluids for HADR/ERD including reaming, backreaming and wiper trips
- Apply lost circulation and stuck pipe prevention, real-time monitoring and decision making
- Illustrate casing running in long-reach wells, cementing design for high-angle wells and wellbore cleaning and displacement
- Employ liner installation and hanger selection and completion strategies in ERD wells
- Recognize HSE challenges in high-angle operations and apply ERD risk identification and mitigation including drilling troubleshooting in HADR/ERD
- Identify the types and causes of vibration, modeling and monitoring tools, downhole tools for vibration reduction and surface parameter adjustments
- Implement best practices in ERD execution, cost analysis and economic considerations

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 high-angle and extended reach drilling for drilling engineers, directional drilling specialists, well planners and drilling supervisors, geologists and geoscientists involved in wellbore planning, completions and production engineers, rig site personnel involved in high-angle or ERD operations, HSE personnel supporting drilling operations, technical service providers and contractors in directional drilling services and other technical staff.

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
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 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.

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. Konstantin Zorbalas, MSc, BSc, is a **Senior Petroleum Engineer & Well Completions Specialist** with over **25 years** of **offshore** and **onshore** experience in the **Oil** & **Gas**, **Refinery** & **Petrochemical** industries. His wide expertise includes **Workovers & Completions**, **Petroleum Risk & Decision Analysis**, Electrical Submersible Pumps Application, **ESP** Assembly & Disassembly Techniques, **ESP** Modeling & Design, **ESP** Construction & Operational Monitoring, **ESP** Troubleshooting & Maintenance, **Acidizing Application** in **Sandstone** & **Carbonate**, **Well Testing Analysis**, **Stimulation Operations**, **Reserves Evaluation**, **Reservoir Fluid Properties**, **Reservoir Engineering & Simulation Studies**, **Reservoir Monitoring**, **Artificial Lift Design**, **Gas Operations**, **Workover/Remedial Operations** & **Heavy Oil Technology**, **Applied Water Technology**, **Oil & Gas Production**, **X-mas Tree** & **Wellhead Operations** & **Testing**, **Artificial Lift Systems** (**Gas Lift**, **ESP**, and **Rod Pumping**), **Well Cementing**, **Production Optimization**, **Well Completion Design**, **Sand Control**, **PLT Correlation**, **Slickline Operations**, **Acid Stimulation**, **Well testing**, **Production Logging**, **Project Evaluation** & **Economic Analysis**. Further, he is actively involved in **Project Management** with special emphasis in production technology and field optimization, performing conceptual studies, economic analysis with risk assessment and field development planning. He is currently the **Senior Petroleum Engineer & Consultant** of **National Oil Company** wherein he is involved in the mega-mature fields in the Arabian Gulf, predominantly carbonate reservoirs; designing the acid stimulation treatments with post-drilling rigless operations; utilizing CT with tractors and DTS systems; and he is responsible for gas production and preparing for reservoir engineering and simulation studies, well testing activities, field and reservoir monitoring, production logging and optimization and well completion design.

During his career life, Mr. Zorbalas worked as a **Senior Production Engineer**, **Well Completion Specialist**, **Production Manager**, **Project Manager**, **Technical Manager**, **Technical Supervisor** & **Contracts Manager**, **Production Engineer**, **Production Supervisor**, **Production Technologist**, **Technical Specialist**, **Business Development Analyst**, **Field Production Engineer** and **Field Engineer**. He worked for many **world-class oil/gas companies** such as **ZADCO**, **ADMA-OPCO**, **Oilfield International Ltd**, **Burlington Resources** (later acquired by **Conoco Phillips**), **MOBIL E&P**, **Saudi Aramco**, **Pluspetrol E&P SA**, **Wintershall**, **Taylor Energy**, **Schlumberger**, **Rowan Drilling** and **Yukos EP** where he was in-charge of the **design and technical analysis** of a gas plant with capacity **1.8 billion m3/yr gas**. His achievements include **boosting oil production 17.2% per year** since 1999 using **ESP** and **Gas Lift systems**.

Mr. Zorbalas has **Master** and **Bachelor** degrees in **Petroleum Engineering** from the **Mississippi State University**, **USA**. Further, he is an **SPE Certified Petroleum Engineer**, **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), an active member of the Society of Petroleum Engineers (**SPE**) and has numerous scientific and technical publications and delivered innumerable training courses, seminars and workshops worldwide.

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.

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: ***Monday, 22nd of September 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Fundamentals of Directional Drilling*** *Definitions: High-Angle, ERD, S-Shaped, J-Type, Build-Hold-Drop Profiles • Applications & Benefits • Directional Drilling versus Vertical Drilling • Horizontal versus Extended-Reach Classifications*
0930 - 0945	*Break*
0945 – 1045	***Well Planning Principles for HADR/ERD*** *Planning Process Overview • Objectives & Design Criteria • Key Performance Indicators (KPIs) • Collaboration Across Disciplines*
1045 - 1145	***Geomechanics & Borehole Stability*** *Formation Stresses & Pore Pressures • Collapse & Fracture Gradients • Stability in Curved & Long-Reach Sections • Mitigation Strategies*
1145 - 1230	***Surveying & Wellbore Positioning*** *Measurement Methods (MWD, Gyro, Magnetic) • Survey Error Models • Anti-Collision Planning • Dogleg Severity & Toolface Orientation*
1230 – 1245	*Break*
1245 – 1330	***Drilling Tools & BHA Design*** *Bottom Hole Assembly Types • Motor & Rotary Steerable Systems • Stabilizers & Shock Tools • Tool Selection for High-Angle Wells*
1330 - 1420	***Case Studies & Global Benchmarks*** *Record ERD Wells Globally • Challenges Encountered & Overcome • KPIs Achieved • Lessons Learned*
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, 23rd of September 2025
0730 – 0830	***Well Trajectory Design & Planning*** *Build Hold & Drop Sections • Tangent Sections & Vertical Departure • Planning Tools & Software • Smoothing Trajectory to Reduce Tortuosity*
0830 – 0930	***Torque & Drag Modeling*** *Concepts & Calculations • Friction Factors (Open Hole versus Cased Hole) • Buckling Limits • Mitigation Strategies: Lubricants, Jar Placement*
0930 - 0945	*Break*
0945 – 1130	***Casing & Liner Design in ERD*** *Casing Loads & Stress Analysis • Wear Considerations • Expansion & Contraction • Centralizer Placement Strategy*
1130 - 1230	***Drillstring Design for Extended Reach*** *Pipe Selection & Design • Fatigue & Buckling Limits • Bending & Tension Stress • BHA Placement & Risk Control*
1230 - 1245	*Break*
1245 - 1330	***Hydraulic Optimization in Long-Reach Wells*** *Pressure Losses through Annulus & Drillpipe • ECD Management • Hole Cleaning Strategies • Cuttings Transport at High Inclinations*
1330 - 1420	***Software Tools for ERD Planning*** *Landmark COMPASS, WellPlan, Drillbench • Torque & Drag Simulation • Hydraulics Simulators • Anti-Collision & Survey Tools*
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, 24th of September 2025
0730 – 0830	***Hole Cleaning in High-Angle Wells*** *Cuttings Transport Theory • Effects of Inclination on Cleaning Efficiency • Flow Regime & Velocity Requirements • Pill Sweeps & Backreaming Techniques*
0830 – 0930	***Managing ECD & Pressure Control*** *ECD Buildup in Long Open-Hole Sections • Mud Weight versus Pressure Windows • Surge/Swab Effects • Monitoring & Mitigation*
0930 - 0945	*Break*
0945 – 1130	***Drilling Fluids for HADR/ERD*** *Fluid Properties Affecting Hole Cleaning • Low-Solids & Non-Aqueous Fluids • Lubricity & Temperature Stability • Filtration Control & Plugging*
1130 - 1230	***Reaming, Backreaming & Wiper Trips*** *When & Why to Ream • Avoiding Ledges & Hole Spiraling • Connection Practices • Vibration Mitigation*
1230 - 1245	*Break*
1245 - 1330	***Lost Circulation & Stuck Pipe Prevention*** *Causes in High-Angle & ERD Wells • LCM Treatments & Spotting Techniques • Pipe Sticking Indicators • Preventive Best Practices*

1330 - 1420	***Real-Time Monitoring & Decision Making*** *Surface versus Downhole Sensors • Torque Drag ROP & Pressure Monitoring • Early Warning Signs • Automated Drilling Optimization Systems*
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, 25th of September 2025***

0730 – 0830	***Casing Running in Long-Reach Wells*** *Forces Acting on Casing • Best Practices for Casing Lubrication • Centralizer Placement & Drag Modeling • Casing Wear & Damage*
0830 – 0930	***Cementing Design for High-Angle Wells*** *Slurry Placement & Displacement Challenges • Cementing Tools (Stage Collars Float Equipment) • Cement Plug Placement • Avoiding Channeling & Voids*
0930 - 0945	*Break*
0945 – 1130	***Wellbore Cleaning & Displacement*** *Spacer Train & Sequencing • Hole Conditioning Requirements • Centralization & Circulation • Displacement Hydraulics*
1130 - 1230	***Liner Installation & Hanger Selection*** *Liner Length Limitations • Hanger Systems for ERD • Expansion & Sealing Issues • Liner-Top Packer Installation*
1230 - 1245	*Break*
1245 - 1330	***Completion Strategies in ERD Wells*** *Sand Control & Screen Installation • Multistage Fracturing Setups • Deployment via Coiled Tubing • Zonal Isolation Techniques*
1330 - 1420	***HSE Challenges in High-Angle Operations*** *Rig Floor Safety in High-Angle Runs • Equipment Handling Risks • Personnel Training • Emergency Preparedness*
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*

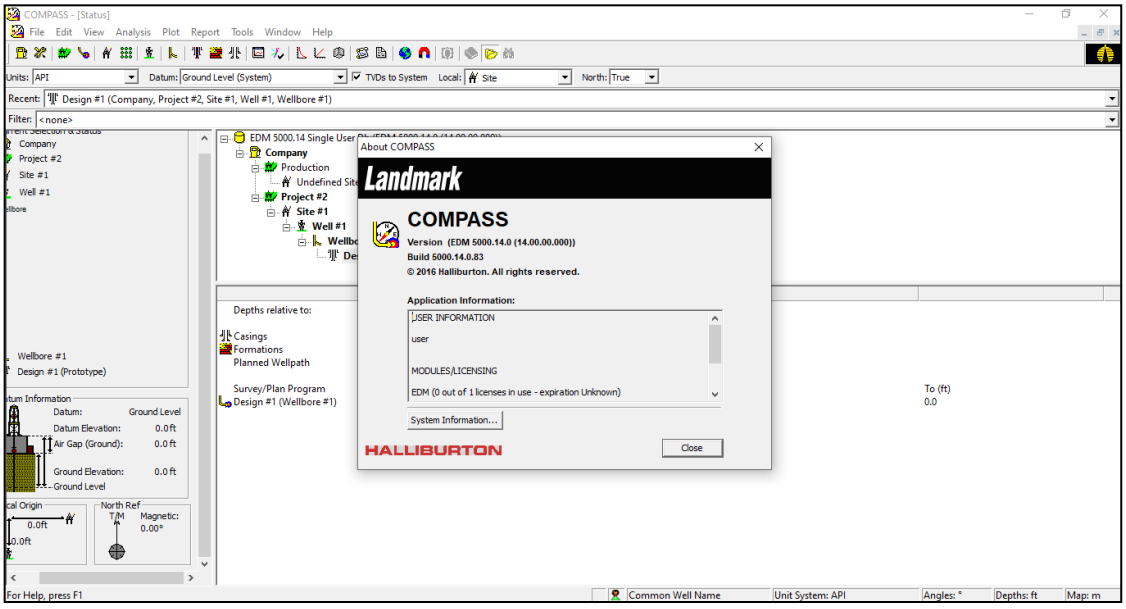
Day 5: ***Friday, 26th of September 2025***

0730 – 0830	***ERD Risk Identification & Mitigation*** *Key Risk Categories • Risk Ranking & Prioritization • Early Detection & Response • Incorporating Lessons Learned*
0830 – 0930	***Drilling Troubleshooting in HADR/ERD*** *Stuck Pipe & Lost Circulation Events • Excessive Torque or Drag • Hole Instability Symptoms • Decision-Making Models*
0930 - 0945	*Break*
0945 – 1130	***Vibration Stick-Slip & Shock Mitigation*** *Types & Causes of Vibration • Modeling & Monitoring Tools • Downhole Tools for Vibration Reduction • Surface Parameter Adjustments*

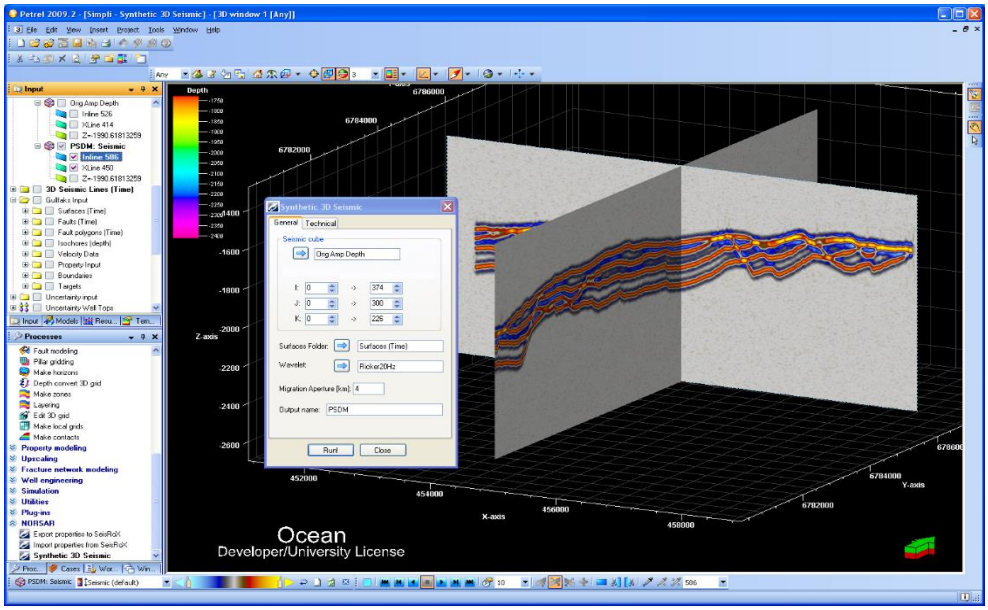
1130 – 1230	***Best Practices in ERD Execution*** *Pre-Spud Checklist & Audits • Connection Practices & Survey Routines • Bit Run Strategy • Crew Training & Handovers*
1230 - 1215	*Break*
1215 – 1300	***Cost Analysis & Economic Considerations*** *Cost Drivers in ERD • AFE Breakdown for ERD Wells • Performance Benchmarking • ROI & Economic Feasibility*
1300 - 1345	***Final Case Studies & Lessons Learned*** *Successful HADR/ERD Campaigns • Drilling Record Reviews • Pitfalls & Recovery Strategies • Discussion & Q&A Session*
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*

Simulator (Hands-on Practical Sessions)

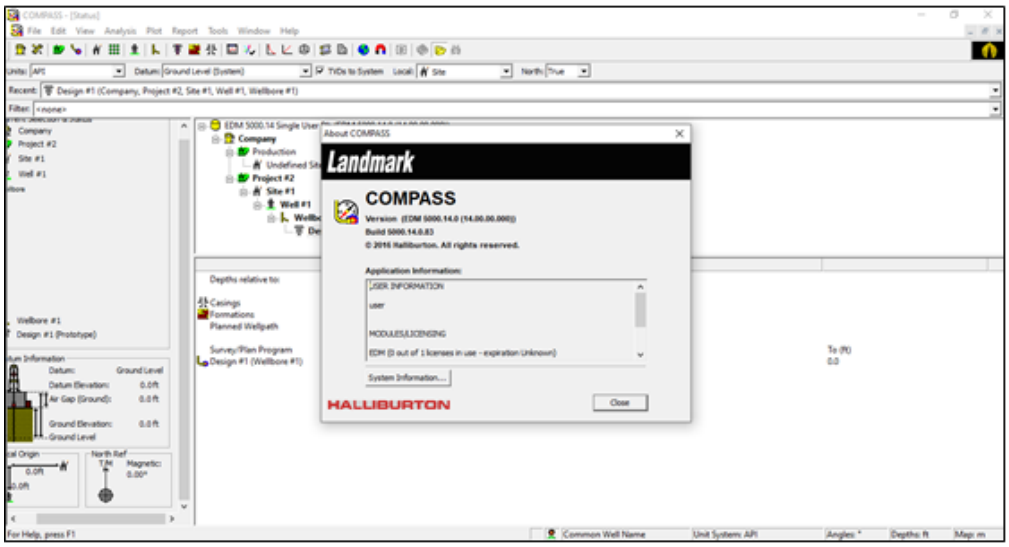
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the "Landmark COMPASS", "Petrel Software", "COMPASS", "Monte Carlo", "KAPPA", "Interactive Petrophysics (IP)", "ECRIN", "PIPESIM", "Eclipse Software" and "PROSPER" software's.



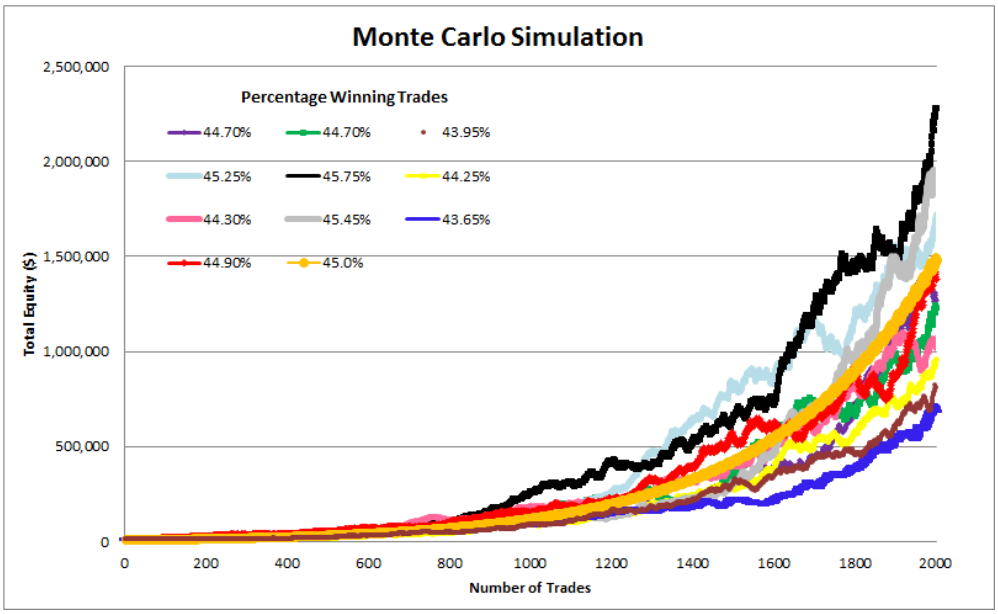
Landmark COMPASS Software



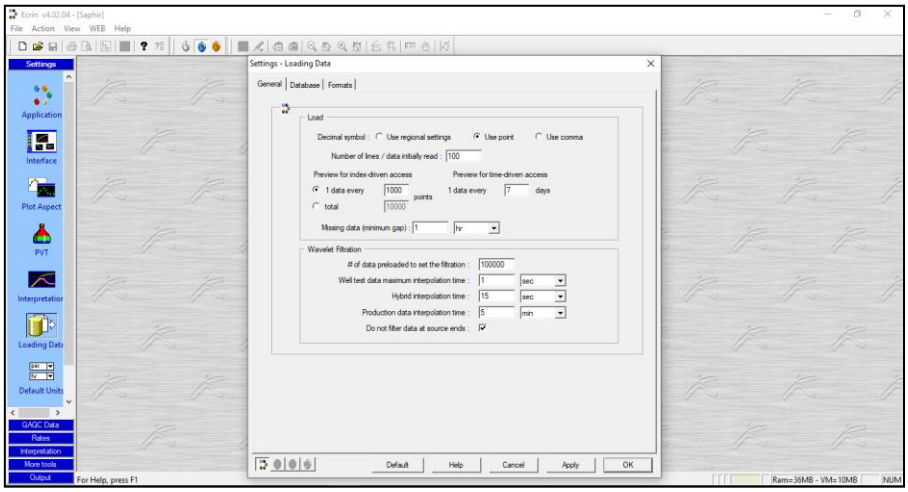
Petrel Software



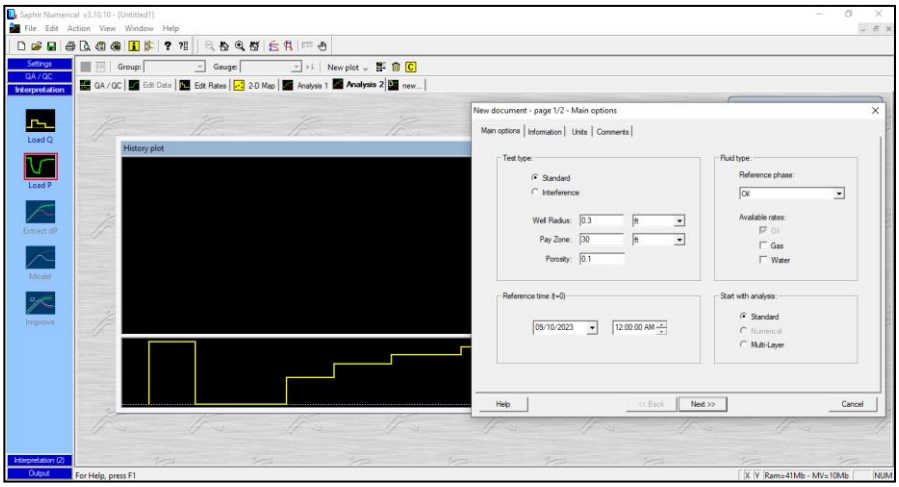
COMPASS



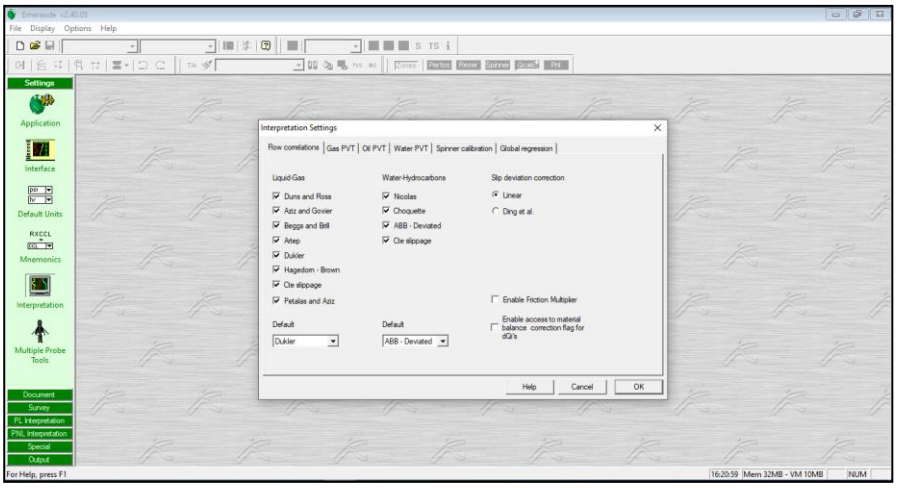
Monte Carlo Simulation



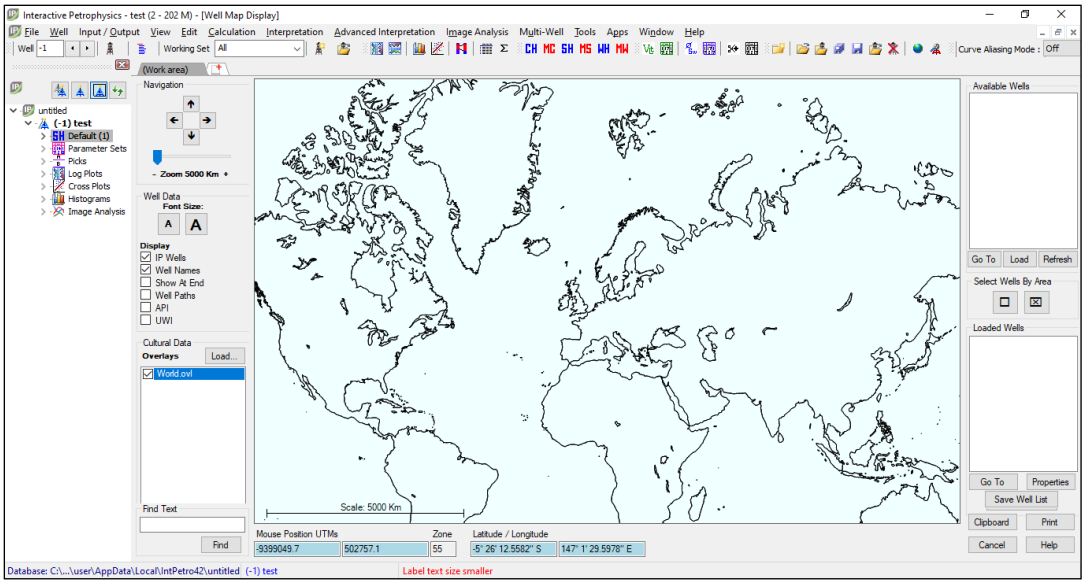
KAPPA Ecrin v4.02.04



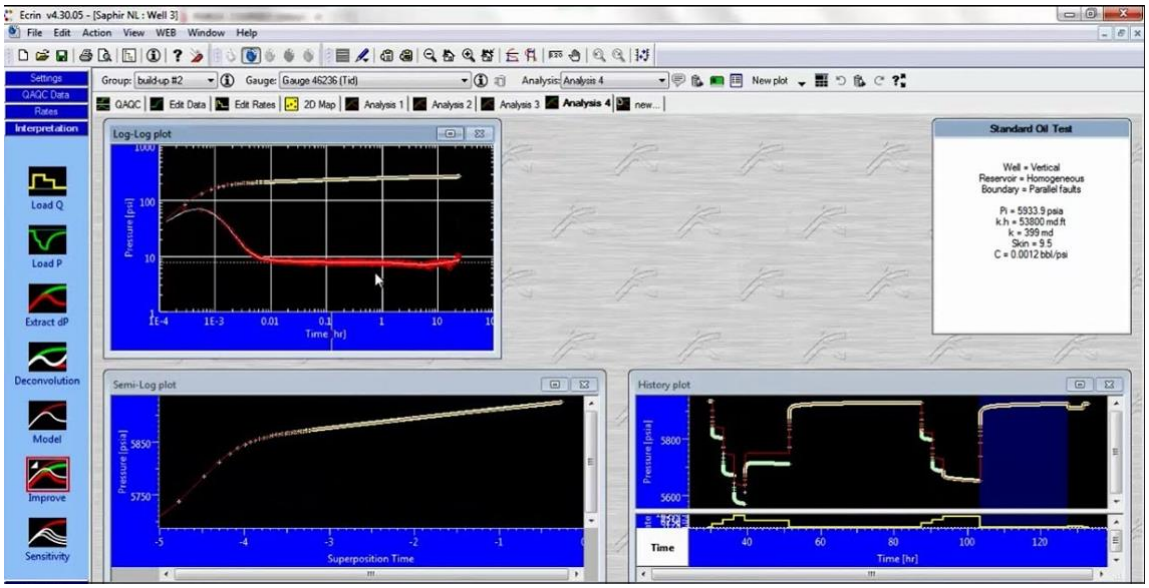
KAPPA Saphir v3.10.10



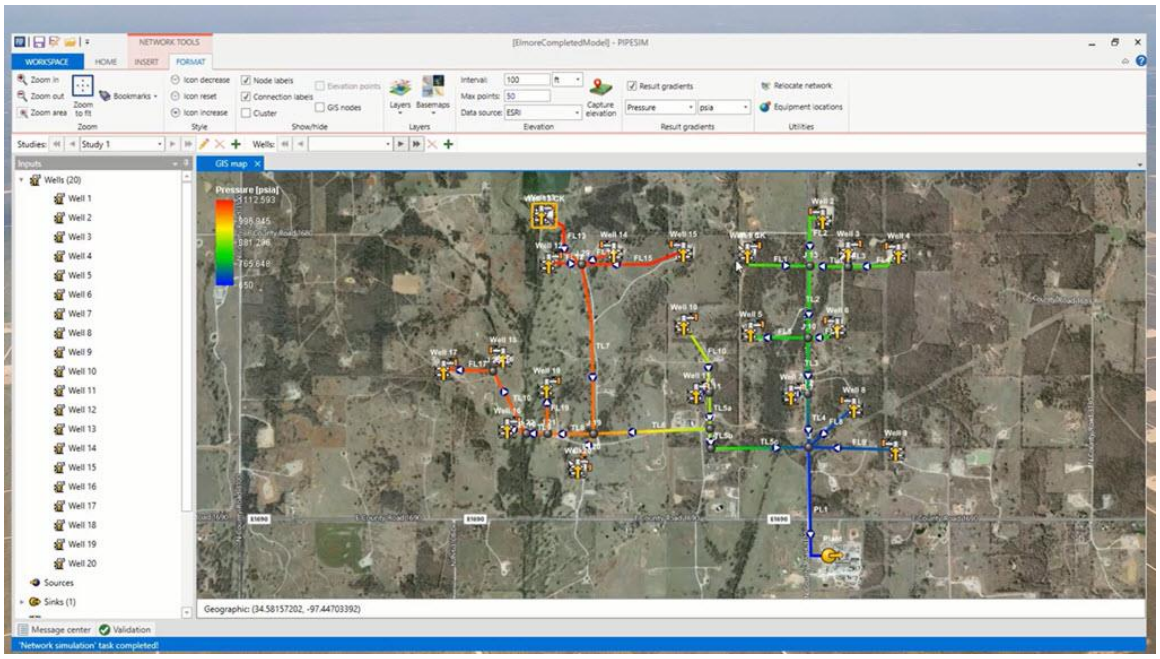
KAPPA Emeraude v2.40.05



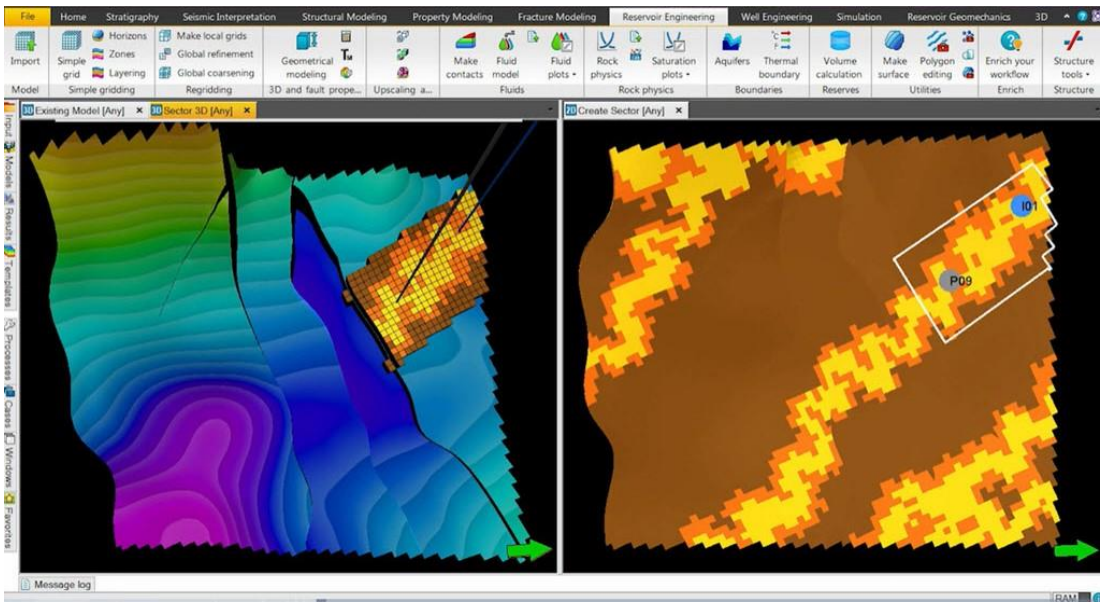
Interactive Petrophysics (IP) Software



ECRIN Software



PIPESIM



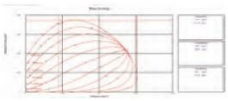
Eclipse Software

PROSPER

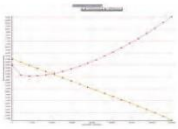
MULTIPHASE WELL AND PIPELINE NODAL ANALYSIS

WELL AND PIPELINE MODELS

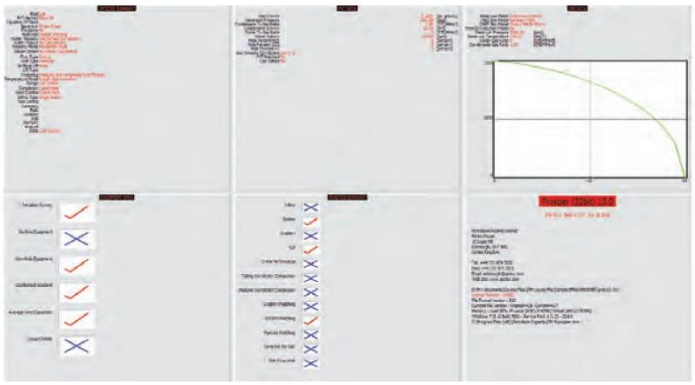
FULLY COMPOSITIONAL



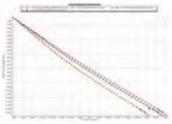
INFLOW/OUTFLOW RESPONSE



STEAM WELLS



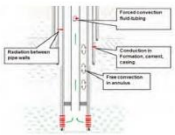
OUTFLOW (VLPs) MODELS



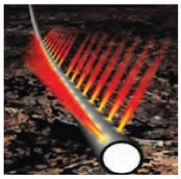
FLOW ASSURANCE

ARTIFICAL LIFT SYSTEMS

THERMAL MODELLING

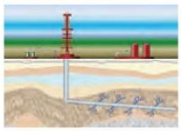


PERFORMATION DESIGN AND PERFORMANCE



MULTILATERAL COMPLETIONS

INFLOW (IPRs) MODELS



Course Coordinator
Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org