COURSE OVERVIEW DE0125-4D
Matrix Stimulation

Course Title
Matrix Stimulation

Course Date/Venue
Session 1: August 19-22, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: November 25-28, 2024/Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE0125-4D

Course Duration/Credits
Four days/2.4 CEUs/2.4 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

Matrix stimulation is a treatment designed to treat the near-wellbore reservoir formation rather than other areas of the production conduit, such as the casing across the production interval, production tubulars or the perforations. Matrix stimulation treatments include acid, solvent and chemical treatments to improve the permeability of the near-wellbore formation, enhancing the productivity of a well. Matrix stimulation is a process of injecting a fluid into the formation, either an acid or solvent at pressures below the fracturing pressure, to improve the production or injection flow capacity of a well.

This course is designed to provide participants with a detailed and up-to-date overview of matrix stimulation. It covers the formation characterization; the nature of formation damage; the acidizing fluids selection; the fluid placement and diversion in sandstone acidizing; the matrix acidizing treatment; the principles of acid fracturing; the mechanics of acid fracture propagation; and the acidizing techniques for extended reach and horizontal wells.

Course Objectives

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

- Apply and gain systematic techniques and methodologies on matrix stimulation
- Identify the formation characterization and illustrate the nature of formation damage
- Select acidizing fluids and implement fluid placement and diversion in sandstone acidizing
- Evaluate the matrix acidizing treatment and explain the principles of acid fracturing
- Illustrate the mechanics of acid fracture propagation and implement acidizing techniques for extended reach and horizontal wells

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course covers systematic techniques and methodologies on matrix stimulation for production engineers and other petroleum industry professionals who are involved in the important activities of reservoir evaluation, development and management and for those who require invaluable skills in the application of the techniques described for the successful exploitation of oil and gas reservoirs.

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$ 6,750 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)

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 **2.4 CEUs** (Continuing Education Units) or **24 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:

Mr. Victor Saran, MSc, BSc, is a **Senior Drilling & Petroleum Engineer** with over **40 years** of **offshore** & **onshore** experience within the **Oil & Gas** and **Petroleum** industries. His wide expertise covers **Wellhead Testing & Operations**, **Well Stimulation & Reservoir** Management, **Well** Performance, **Well** Servicing, **Well** Killing Procedures, **Well** Completion, **Well** Fracturing, **Well** Testing, **Acid Additives**, **Perforating Techniques**, **Sandstone Acidizing**, **Carbonate Acidizing**, **Acid Fracturing**, **Production** Engineering, **Well** Monitoring & Testing, **Applied Reservoir** Engineering, **Water Flooding**, **Workover & Completions**, **Injection** Systems, **Artificial Lift Systems**, **Gas Lift**, **ESP**, **Rod Pumping**, **Production Testing** & Optimization, **Slickline** and Electric Line Operations, **Perforating & Logging**, **Coiled Tubing** Operations, Nozzles, Motors, Deposits Removal & Inhibition and **Asphaltnes-Sulphates**, Workover Completion, Water Injection & Gas Lift, Nodal Analysis, Drill Stem Testing, H_2S Crude Oil and Oil & Gas Production. Further, he is also well-versed in risk assessments, pipelines construction, pump & loading terminals, material and services procurement, budgeting, contracts & logistics, safety and personnel issues, tendering procedures, budget and work program, cost control–cost recovery, selection of materials and services and quality control. Currently, he is the **Country Manager** of **Energean Oil & Gas** wherein he is responsible in organizing and supervising the drilling of exploration wells and well connections and testing.

During Mr. Saran's life, he has gained his practical and field experience through his various significant positions as the **Completions Consultant**, **Lecturer/Instructors**, **Part-Time Assistant Lecturer**, **Part-Time Instructor**, **Technical Consultant**, **Drilling & Workover Manager**, **Production Manager**, **Production Engineer**, **Petrochemical Engineer**, **Mechanical Engineer**, **Petroleum Services Engineer** for numerous international companies and universities that includes **Lukoil Neftochim**, **J&P Avax**, **Kavala Oil Greece**, **North Aegean Petroleum Company**, **Petrola International**, **Dowell Schlumberger**, **Technological Institute of Kavala**, **University of Thessaloniki** and **University of Crete**.

Mr. Saran has a **Master's** degree in **Fuel Technology** and a **Bachelor's** degree in **Mechanical Engineering** from the **University of Portsmouth Polytechnic**, **UK** and the **University of Westminster London**, **UK** respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and has conducted numerous trainings, workshops and conferences worldwide.

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	***Overview of Reservoir Stimulation*** *Inflow Performance ● Alterations in the Near-Wellbore Zone ● Tubing Performance & NODAL* Analysis ● Decision Process for Well Stimulation ● Reservoir Engineering Considerations for Optimal Production Enhancement Strategies ● Stimulation Execution*
0930 – 0945	*Break*
0945 – 1100	***Formation Characterization*** *Pressure Derivative in Well Test Diagnosis ● Parameter Estimation from Pressure Transient Data ● Test Interpretation Methodology ● Analysis with Measurement of Layer Rate ● Layered Reservoir Testing ● Testing Multilateral & Multibranch Wells ● Permeability Determination from a Fracture Injection Test*
1100 – 1230	***Formation Characterization (cont'd)*** *Rock Behavior ● Rock Mechanical Property Measurement ● State of Stress in the Earth ● In-Situ Stress Management ● Depth ● Temperature ● Properties Related to the Diffusion of Fluids ● Properties Related to the Deformation & Fracturing of Rock ● Zoning*
1230 – 1245	*Break*
1245 – 1420	***Nature of Formation Damage*** *Pseudodamage vs Formation Damage ● True Formation Damage ● Origin of Formation Damage ● Damage Removal*
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

0730 – 0930	***Acidizing Physics*** *Solid-Liquid Reaction Under No-Flow Conditions ● Solid-Liquid Reaction with a Moving Fluid ● Other Instabilities*
0930 – 0945	*Break*
0945 – 1115	***Acidizing Physics (cont'd)*** *Practical Implications in Sandstone Acidizing ● Practical Implications in Carbonate Acidizing*
1115 – 1245	***Matrix Acidizing of Sandstones*** *Criteria for Fluid Selection ● Organization of the Decision Tree ● Preflush & Postflush*
1245 – 1300	*Break*

1300 – 1420	***Matrix Acidizing of Sandstones (cont'd)*** *Acidizing Sandstones with Mud Acid ● Other Acidizing Formulations ● Matrix Acidizing Design*
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

0730 – 0930	***Fluid Placement & Diversion in Sandstone Acidizing*** *Techniques of Fluid Placement ● Diverting Agents ● Laboratory Characterization of Diverting Agent Efficiency ● Prediction of Efficiency at Reservoir Conditions*
0930 – 0945	*Break*
0945 – 1115	***Matrix Acidizing Treatment Evaluation*** *Derivation of Bottomhole Parameters from Wellhead Measurements ● Monitoring Skin Evolution During Treatment*
1115 – 1245	***Matrix Acidizing Treatment Evaluation (cont'd)*** *The Prouvost & Economides Method ● Discussion: Components of Pressure Response ● Example Calculation*
1245 – 1300	*Break*
1300 – 1420	***Principles of Acid Fracturing*** *Comparison of Acid Fracturing vs Fracturing with Propping Agent & Nonreactive Fluids ● Factors Controlling the Effectiveness of Acid Fracturing Treatments ● Acid Fluid Loss ● Acid Spending During Fluid Injection ● Treatment Design ● Acid Fracturing Treatment Models ● Example Application of Acid Fracture Design*
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

0730 – 0930	***Acid Fracture Propagation & Production*** *Mechanisms of Acid Penetration ● Production Model ● Production Behavior of Acid Fractures*
0930 – 0945	*Break*
0945 – 1130	***Acid Fracture Propagation & Production (cont'd)*** *Performance Type Curves ● Comparison Between Acid & Propped Fractures*
1130 – 1230	***Extended Reach & Horizontal Wells*** *Performance Comparison Between Fully Completed Vertical & Horizontal Wells ● Comparison of Fully Completed Horizontal Wells with Hydraulically Fractured Vertical Wells*
1230 – 1245	*Break*

1245 – 1345	***Extended Reach & Horizontal Wells (cont'd)*** *Borehole Stability ● Stimulation ● Performance of Hydraulically Fractured Horizontal Wells*
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*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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