COURSE OVERVIEW DE0544
Oilfield Scaling Analysis

Course Title
Oilfield Scaling Analysis

Course Date/Venue
Session 1: May 26-30, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: September 21-25, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
DE0544

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

This course is designed to provide participants with a detailed and up-to-date overview of Oilfield Scaling Analysis. It covers the common types of scales in petroleum production and the impact of scale deposition on production efficiency; the various types of oilfield scales, mechanisms of scale formation and the factors influencing scale deposition; the impact of scale on oilfield operations including laboratory and field detection of scales; the real-time scale monitoring techniques, water chemistry and scale formation potential; the role of production chemistry in scale deposition; and the risk assessment and mitigation planning.

During this interactive course, participants will learn the scale prevention through water chemistry control; the proper selection and application of chemical scale inhibitors; the deployment strategies for scale inhibitors, alternative scale prevention methods and scale prevention in water injection systems; the mechanical scale removal techniques, chemical scale dissolution methods and hydrothermal and electrochemical scale removal; the downhole and surface facility scale removal and safety and environmental considerations in scale treatment; the AI and machine learning in scale prediction and control; and the scale management in enhanced oil recovery (EOR),

Course Objectives

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

- Apply and gain an in-depth knowledge on oilfield scaling analysis
- Discuss the common types of scales in petroleum production and the impact of scale deposition on production efficiency
- Identify the various types of oilfield scales, mechanisms of scale formation and the factors influencing scale deposition
- Explain the impact of scale on oilfield operations including laboratory and field detection of scales
- Carryout real-time scale monitoring techniques and identify water chemistry and scale formation potential
- Define the role of production chemistry in scale deposition and apply risk assessment and mitigation planning
- Employ scale prevention through water chemistry control as well as the proper selection and application of chemical scale inhibitors
- Apply deployment strategies for scale inhibitors, alternative scale prevention methods and scale prevention in water injection systems
- Carryout mechanical scale removal techniques, chemical scale dissolution methods and hydrothermal and electrochemical scale removal
- Implement downhole and surface facility scale removal and safety and environmental considerations in scale treatment
- Apply AI and machine learning in scale prediction and control including scale management in enhanced oil recovery (EOR)

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 oilfield scaling analysis for production engineers, reservoir engineers, well engineers, chemical engineers, corrosion engineers, operations personnel, maintenance teams, service company representatives and field technicians.

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: -

- 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.

- 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.

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 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. David Berryman is a **Senior Drilling Operations Engineer** with over **40 years** of **Offshore** & **Onshore** experience within the **Oil & Gas** industries. He is an international expert in **Drill String** Intensity & Design, **Drill String** Optimization, **Stuck Pipe Prevention**, **Wireline** Operations & Techniques, **Fishing** Operations, **Drilling & Petroleum** Engineering, **ERD Drilling**, **Well Service** Operations, **Well Test** Design & Analysis, **Well Composite**, **Construction Integrity**, **Completion & Production** Optimization, **Well Completion**, **Well Integrity** Management, **Well Bore** Analysis, **Well Control** & **Blowout Prevention**, **Well Bore Integrity**, High Pressure High Temperature (**HPHT**), Pulling Out of Hole (**POOH**), **PWD Interpretation**, **Surface Logging**, **Drilling Optimization**, **Well Planning**, **Horizontal** & **Directional Drilling**, **Well Hole Cleaning**, **Mud-Logging**, **Downhole Vibration**, **Extended Reach Drilling**, **Torque & Drag Modelling**, **Pore Pressure** Evaluation, **Pressure Transient Testing & Reservoir Performance** Evaluation, **Review Process Data & Fluid Properties**, **Conductor Line Pressure Surveys** and **Chemical Tubing Cutting**. He is also well-versed in Bow-Tie HSE Risk Management System, **Hydraulics** Management, Data Interpretation, **Petroleum Data** Management, Hydraulic Calculations, Safety Management System, **Rig** Operations and various **drilling softwares** including **Well Plan** and **Compass** (**Landmark**); DFG, Planit, Insite Anywhere (**Halliburton**); Discovery Well, Discovery Web (Kongsberg); Digital Well File (Petrolink) and Well View (Peloton).

Throughout his long career life, Mr. Berryman has worked for many international companies in the **Gulf of Mexico**, **Europe**, **Africa**, **Central Asia** (Kazakhstan) the **Middle East**, **Far East** and the **North Sea** such as Marathon Oil UK, Talisman-Sinopec, BG Group, Sperry Drilling, Stavanger, BP, Hycalog, Camtest/Camco and Gearheart. He had occupied various key positions as the **Drilling Manager**, **Drilling Engineer Supervisor**, **Drilling Supervisor**, **Drilling Operations Engineer**, **Applied Drilling Technology Engineer**, **Data Engineer**, **Mud Logger**, **Sales & Service Engineer** and **Downhole Gauge Engineer** and **Senior Instructor/Trainer**. During this period, he has led the development of a **software solution** for real-time monitoring of drag whilst tripping in extended reach wells.

Mr. Berryman has a **Bachelor's** degree in **Mining** from the **University of Leeds**, **UK**. Further, he has acquired **certifications** from the **IWCF** for **Combined Surface** and **Subsea Blow-Out Preventer Stack**, the **BOSIET**, the **UKCS** for Offshore Working and the **Prince2 Foundation** for **Project Management**. Further, he is a **Certified Instructor/Trainer**, a **Drill String Design Proctor** by **Fearnley**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**) and has delivered and presented innumerable training courses and workshops worldwide.

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 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	***Introduction to Oilfield Scaling*** *Definition and Significance of Scaling in Oilfield Operations • Common Types of Scales in Petroleum Production • Impact of Scale Deposition on Production Efficiency • Approach to Managing Oilfield Scaling*
0930 - 0945	*Break*
0945 - 1045	***Types of Oilfield Scales*** *Carbonate Scales (Calcium Carbonate, Iron Carbonate) • Sulfate Scales (Barium Sulfate, Strontium Sulfate, Calcium Sulfate) • Silicate and Silica-Based Scales • Mixed and Organic Scales (Asphaltene and Wax Interactions)*
1045 - 1130	***Mechanisms of Scale Formation*** *Thermodynamic and Kinetic Aspects of Scale Deposition • Role of Temperature, Pressure, and Salinity in Scaling • Mixing of Incompatible Waters (Formation Water vs. Injection Water) • Scale Formation in Different Production Environments*
1130 - 1230	***Factors Influencing Scale Deposition*** *Reservoir Mineralogy and Fluid Composition • Well Operations and Flow Rate Variations • Effects of Enhanced Oil Recovery (EOR) Methods • Pipeline and Facility Conditions Affecting Scale Formation*
1230 - 1245	*Break*
1245 - 1330	***Impact of Scale on Oilfield Operations*** *Flow Restriction and Tubing Blockage • Reduced Production Efficiency and Equipment Failure • Corrosion Acceleration Due to Scale Formation • Cost Implications of Untreated Scaling Problems*
1330 – 1420	***Laboratory & Field Detection of Scales*** *Sampling Techniques for Scale Identification • Chemical and X-Ray Diffraction (XRD) Analysis of Scale Deposits • Scanning Electron Microscopy (SEM) for Scale Morphology • Laboratory Analysis Procedures for Scale Assessment*
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 – 0830	***Scale Prediction Models & Thermodynamic Software*** *Importance of Predictive Modeling in Scale Control • ScaleChem, OLI ScaleSoft, and MultiScale Software Overview • Thermodynamic vs. Kinetic Modeling Approaches • Case Studies on Predictive Modeling in Fields*
0830 – 0930	***Real-time Scale Monitoring Techniques*** *Online and Offline Scale Detection Methods • Use of Ultrasonic and Acoustic Sensors for Scale Monitoring • Chemical Analysis of Produced Water for Scaling Tendencies • Role of Fiber Optic Technology in Remote Scale Monitoring*

0930 – 0945	*Break*
0945 – 1100	***Water Chemistry & Scale Formation Potential*** *Key Parameters Influencing Scale Formation (pH, Temperature, Pressure) • Sulfate and Carbonate Ion Concentration Analysis • Water Compatibility Assessment Before Injection • Best Practices for Water Treatment in Scale Prevention*
1100 – 1230	***Role of Production Chemistry in Scale Deposition*** *Effect of Scaling Ions on Well Integrity • Gas, Oil, and Water Interactions Leading to Scale Formation • Chemical Precipitation and Solubility Dynamics • Chemical Inhibitors and their Role in Scale Management*
1230 – 1245	*Break*
1245 – 1330	***Case Studies on Scale Prediction & Monitoring*** *Field-Scale Validation of Prediction Models • Early Detection and Intervention Strategies • Case Studies on Real-Time Scale Monitoring • Future Improvements in Scale Prediction Techniques*
1330 – 1420	***Risk Assessment & Mitigation Planning*** *Identifying High-Risk Wells and Facilities • Cost-Benefit Analysis of Proactive vs. Reactive Scale Management • Scale Prevention vs. Remediation Decision-Making • Risk Assessment Approach for Scaling Issues*
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 – 0830	***Scale Prevention Through Water Chemistry Control*** *Controlling Bicarbonate and Sulfate Levels in Injection Water • Adjusting pH to Reduce Scaling Risks • Role of Temperature and Pressure Management • Field Applications of Water Treatment in Fields*
0830 – 0930	***Chemical Scale Inhibitors: Selection & Application*** *Types of Scale Inhibitors (Phosphonates, Polymers, Carboxylates) • Mechanisms of Action in Preventing Scale Formation • Scale Inhibitor Selection Criteria for Different Oilfield Conditions • Chemical Treatment Programs for Scale Prevention*
0930 – 0945	*Break*
0945 – 1100	***Deployment Strategies for Scale Inhibitors*** *Continuous vs. Batch Scale Inhibitor Injection • Scale Squeeze Treatment for Downhole Prevention • Compatibility of Inhibitors with other Production Chemicals • Smart Inhibitor Release Technologies for Long-Term Protection*
1100 – 1230	***Alternative Scale Prevention Methods*** *Nano-Scale Inhibitors and Advanced Chemical Formulations • Electromagnetic Scale Control Techniques • Use of Biodegradable Inhibitors for Environmental Compliance • Innovations in Sustainable Scale Prevention*
1230 – 1245	*Break*
1245 – 1330	***Scale Prevention in Water Injection Systems*** *Water Pre-Treatment Methods (Softening, Desalination, Filtration) • Scaling Risks in Polymer and CO_2 Injection • Managing Scale Formation in Produced Water Reinjection • Best Practices for Scale Control in Water Handling Systems*

1330 – 1420	***Case Studies on Effective Scale Prevention*** *Success Stories and International Fields • Challenges in Implementing Scale Inhibitor Programs • Lessons Learned from Past Failures and Improvements • Future Trends in Chemical Scale Prevention Technologies*
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 – 0830	***Mechanical Scale Removal Techniques*** *Coiled Tubing and Jetting Methods for Scale Removal • Milling and Drilling Technologies for Hard Scale Deposits • Mechanical Pigging for Pipeline Descaling • Limitations and Risks of Mechanical Removal Methods*
0830 – 0930	***Chemical Scale Dissolution Methods*** *Acid-Based Dissolution (HCl, Organic Acids, Blended Acids) • Chelating Agents for Sulfate Scale Removal • Customized Solvent Blends for Complex Scale Dissolution • Protocols for Chemical Scale Remediation*
0930 – 0945	*Break*
0945 – 1100	***Hydrothermal & Electrochemical Scale Removal*** *High-Temperature Water and Steam Cleaning for Scale Removal • Electrochemical Methods for Breaking Down Scale Deposits • Field Applications of Hydrothermal Descaling • Case Studies on Alternative Scale Removal Techniques*
1100 – 1230	***Downhole & Surface Facility Scale Removal*** *Treatment Options for Downhole Scale Remediation • Managing Scale Deposition in Separators and Pipelines • Integration of Mechanical and Chemical Methods for Optimal Results • Scale Removal Planning and Operational Best Practices*
1230 – 1245	*Break*
1245 – 1420	***Safety & Environmental Considerations in Scale Treatment*** *Handling of Acidizing Chemicals and Safety Protocols • Waste Disposal and Environmental Impact of Chemical Treatments • Risk Assessment and Mitigation Strategies • Compliance with Environmental Regulations in Scale Management*
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

0730 – 0930	***Case Studies on Scale Removal in Oilfield Operations*** *Challenges in Hard-to-Remove Scales • Field Experience with Scale Remediation • Lessons Learned and Best Practices • Future Improvements in Scale Removal Technologies*
0930 – 0945	*Break*
0945 – 1100	***AI & Machine Learning in Scale Prediction & Control*** *AI-Driven Scale Prediction Models • Real-Time Scale Inhibitor Dosage Optimization Using Big Data • Case Studies on AI Applications in Oilfield Scale Management • Future of Predictive Analytics in Scale Management*
1100 – 1230	***Scale Management in Enhanced Oil Recovery (EOR)*** *Scaling Risks in Thermal EOR (Steam Flooding) • Managing Scale Deposition in Polymer and Surfactant Flooding • CO_2 EOR and Associated Scale Challenges • Best Practices for Scale Control in EOR Projects*

1230 - 1245	*Break*
1245 – 1345	***Scale Analysis & Testing*** *Laboratory Testing of Scale Composition and Solubility • Scale Inhibitor Selection and Performance Testing • Practical Exercises in Chemical Scale Dissolution Methods • Data Interpretation and Scale Monitoring Analysis*
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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