COURSE OVERVIEW DE0157
Design of Fiber-Optic DTS and DAS Installations

Course Title
Design of Fiber-Optic DTS and DAS Installations

Course Date/Venue
Session 1: July 28-August 01, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: December 07-11, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
DE0157

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.

Distributed Temperature Sensing (DTS) is an amazing and somewhat new technology through which temperature surveys can be taken non-obtrusively in a well. In another words, a logging tool never goes downhole. A temperature log is recorded continuously along the well depth in real time and at time intervals as small as a few minutes between surveys. This time lapse monitoring capability allows an otherwise difficult-to-interpret temperature log to easily pinpoint production changes.

These DTS systems use a fiber optic line placed in a well typically as a semi permanent installation along the well length. Such systems have found application in high cost horizontal and multilateral wells where re-entry with a logging tool is difficult if not impossible. They are also commonly used in shallow steam injection environments to monitor steam breakthrough in producing wells. Recent years have also witnessed the emergence of Distributed Acoustic and Chemical Sensing, DAS and DCS respectively. These new technologies offer significant new insights into production and reservoir management.

This course is an introduction to the emerging fibre optic technologies of Distributed Temperature Sensing (DTS) as well as related Distributed Acoustic (DAS) and Distributed Chemical Sensing (DCS). This programme looks at how these technologies work, and their application to the oil and gas industry. Such systems have been utilised in shallow steam injection wells as well as high-cost horizontal and multilateral wells where re-entry with a logging tool is difficult, if not impossible.

Course Objectives

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

- Apply and gain a good working knowledge on the design interpretation of DTS production and injection well testing
- Define DTS and explain how does DTS work and where it is used
- Discuss temperature logs and noise logging
- Recognize fiber optic technology for DTS measurements including the light pulse, travel time and distance along the fiber, backscattered spectrum and DTS log
- Identify the typical DTS installations and recordings for instrumentation set-up, optical fiber, cladding and conveyance
- Select laser pulse wavelength and assess condition of installed fiber (OTDR)
- Perform typical DTS installations covering oil well installation, monitoring pressure vessels and leaks in gas pipeline and other DTS applications
- Recognize oil well installations and hardware including types of oil well/gas well installations, single or double ended fiber line and mechanical depth issues
- Interpret and employ DTS in oil/gas wells and site examples of various DTS log applications
- Describe distributed acoustic sensing (DAS) and distributed chemical sensing (DCS)

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 fiber-optic distributed temperature sensing (DTS) well installations for petroleum engineers, geologists and those interested in learning more about the design of DTS and the latest advances in the technology.

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 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.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

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. Samer Shukri, BSc, IWCF, is a **Senior Drilling & Petroleum Engineer** with over **25 years** of **offshore** and **onshore** experience in the **Oil** & **Gas**, **Refinery** & **Petrochemical** industries. His wide expertise includes **Workovers & Completions**, **Well Completion** Design & Operations, **Well Intervention**, **Well Life Cyle**, **Well Stimulation** & **Workover** Planning, **Workover** Practices, **Workover** Operations, **Well Integrity** System, **Well Control**, **Oil & Water Wells**, **Workover/Remedial** Operations & **Heavy Oil** Technology, Plug & Abandonment of **Oil & Gas Wells**, **Petroleum** Engineering, **Open Hole & Cased Hole Logs**, **Petroleum Risk & Decision** Analysis, **Well Testing** Analysis, **Stimulation** Operations, **Coiled Tubing** Operations, **Coiled Tubing Equipment**, **Rigless** Operations, **Reserves Evaluation**, **Reservoir Fluid** Properties, **Reservoir** Engineering & Simulation Studies, **Reservoir** Monitoring, **Geology & Reservoir** Engineering, **Artificial Lift Design**, **Gas** Operations, **Applied Water** Technology, **Oil & Gas Production**, **X-mas Tree** & **Wellhead** Operations & **Testing**, **Wellbore Design & Construction**, **Drilling Fluids & Solids Control**, **Drilling Fluids & Cementing** Operations, **Drilling Practices & Techniques**, **Well Control & Blow Out Prevention**, **Stuck Piping & Fishing** Operations, **Rig Equipment** Maintenance & Inspection, **Rigging & Lifting** Operations, **WellCAP** Driller, **WellCAP** Supervisor, **Artificial Lift** Systems (**Gas Lift**, **ESP** and **Rod Pumping**), **Well Cementing**, **Oil Field Cementing**, **Production Optimization**, **PLT** Correlation, **Slickline** Operations, **Well Testing**, **Production Logging**, **Wireline Logging**, **Wireline** Technology, **Wireline Fishing** Operations, **Project Evaluation** & **Economic Analysis**. Further, he is also well-versed in Marine Environment Protection, Maritime Professional Training, Operational Audit, Improvement, Planning & Management, Climate Change & Emissions Trading Services, International Trade & Shipping, **Fitness for Service-API 579**, **Refining Process & Petroleum** Products, **OSHA** (General Industry & Construction), **IOSH** (Managing Safely, Working Safely), **HSE** Standards & Procedures in the Oilfield, HSE Principles, Incident Prevention & Incidents, Working at Height, **First Aid**, **H2S** Awareness, Defensive Driving, Risk Assessment, Authorized Gas Tester (**AGT**), Confined Space Entry (**CSE**), Root Cause Analysis (**RCA**), Negotiation & Persuasion Skills, **ISO-9001** Quality Management System (**QMS**), ISO-14001 Environmental Management System (**EMS**), **ISO-45001** Occupational Health and Safety Management System (**OHSMS**), **ISO-17020** Conformity Assessment, ISO/TS-29001 Quality Management System, **IOS-50001**-Energy Management System (**EnM**S) and Basic Offshore Safety Induction & Emergency. Currently, he is actively involved in **Project Management** with special emphasis in **commissioning of new wells**, **completion design**, **well integrity** management, **production technology** and field optimization, performing conceptual studies, economic analysis with risk assessment and field development planning.

During his career life, Mr. Samer has gained his field experience through his various significant positions and dedication as the **Senior Production Engineer**, **Well Services Department Head**, **Senior Well Services Supervisor**, **Senior Well Integrity Engineer**, **Senior HSE Engineer**, **Well Services Supervisor**, **Drilling/Workover Supervisor**, **International oil & Gas Trainer**, **Leadership & Management Instructor** and **Senior Instructor/Trainer** from the various international companies such as the ADCO, Al Furat Petroleum Company (AFPC), Syrian Petroleum Company (SPC), Petrotech, Global Horizon-UK, HDTC, Petroleum Engineers Association, STC, Basra University and Velesto Drilling Academy, just to name a few.

Mr. Samer has **Bachelor's** degree in **Petroleum Engineering**. Further, he is an **Accredited IWCF Drilling & Well Intervention Instructor**, a **Certified Instructor/Trainer**, a **Certified Train-the-Trainer** and further delivered innumerable training courses, seminars, conferences and workshops 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	***Introduction to DTS*** *What is DTS • How Does DTS Work? • Where is DTS Used?*
0930 – 0945	*Break*
0945 – 1100	***Overview of Temperature Logs*** *Classic Liquid & Gas Entry • Shut-In Injection Well*
1100 – 1230	***Overview of Temperature Logs (cont'd)*** *Horizontal Production Wells*
1230 – 1245	*Break*
1330 – 1420	***Overview of Noise Logging*** *The Well's Two Word Vocabulary*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Fiber Optic Technology for DTS Measurements - The Light Pulse*** *Velocity of Light in a Glass Fiber • Length of the Light Pulse*
0930 – 0945	*Break*
0945 – 1130	***Fiber Optic Technology for DTS Measurements - Travel Time & Distance Along the Fiber*** *Detecting the Backscattered Signal • Spatial Sampling & Sampling Resolution • Maximum Light Pulse Launch Rate • Reasons for High Pulse Rate*
1130 – 1230	***Fiber Optic Technology for DTS Measurements - Backscattered Spectrum*** *The Rayleigh Brillouin & Raman Lines • Temperature from Anti-Stokes/Stokes Ratio • Optical Distortion • Temperature Resolution*
1230 – 1245	*Break*
1245 – 1420	***Fiber Optic Technology for DTS Measurements*** *The DTS Log*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Typical DTS Installations & Recordings*** *Instrumentation Set-Up*
0930 – 0945	*Break*
0945 – 1030	***Optical Fiber, Cladding & Conveyance*** *The Optical Fiber • Mechanical Fiber Protection*
1030 – 1130	***Selection of Laser Pulse Wavelength***
1130 – 1230	***Assessing Condition of Installed Fiber (OTDR)***

1230 – 1245	*Break*
1245 – 1420	***Typical DTS Installations*** *Oil Well Installation • Monitoring Pressure Vessels • Monitoring Leaks in a Gas Pipeline • Other DTS Applications*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Oil Well Installations & Hardware***
0930 – 0945	*Break*
0945 – 1100	***Types of Oil Well/Gas Well Installations*** *Retrievable Installations • Semi Permanent Installations • Permanent Installations*
1100 – 1230	***Single or Double Ended Fiber Line*** *Single Ended Straight Systems • Partially Returned Fibers • Double Ended Fiber Installations • Comparison of Fiber Deployment Systems*
1230 – 1245	*Break*
1330 – 1420	***Mechanical Depth Issues - Overstuff***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Application/Interpretation of DTS in Oil/Gas Wells*** *Examples of Various DTS Log Applications • Comparison of Wireline & DTS Surveys • Detection of a Channel • DTS Used for Well Monitoring • Monitor ESP Operation, etc • Detect Steam Breakthrough • Velocity Indications from DTS • Fluid Velocity Using SENSA FLO-TRAK™ System*
0930 – 0945	*Break*
0945 – 1145	***Introduction-Distributed Acoustic (DAS) Sensing*** *Noise Detection Along the Fiber • Fluid Movement, Entry Point Location & Velocity • Wave, Frequency & Phase Detection • Video of Man Walking*
1145 – 1230	***Introduction-Distributed Chemical Sensing (DCS)*** *Detection of Specific Chemicals Along Fiber • Fiber Configuration • Techniques to Detect Encroachment of Specific Chemicals*
1230 – 1245	*Break*
1245 – 1345	***DTS & DAS Vendor Demonstrations***
1345 – 1400	***Course Conclusion***
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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