COURSE OVERVIEW DE0156

Workover Practices (E-Learning Module)

Course Title
Workover Practices (E-Learning Module)

Course Reference
DE0156

Course Format & Compatibility
SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration
30 online contact hours
(3.0 CEUs/30 PDHs)

Course Description

Once a well has been drilled to total depth, it must be decided whether it can be made to produce oil and gas in profitable amounts. Perhaps only one out of six wells drilled can ever produce enough petroleum to recover costs and offer profit. Even then, that one well must be completed properly. Recompletion costs are high, and a bad completion may ruin a well. Completion must be done right the first time.

This E-Learning is primarily designed for drilling, production and completion engineers and supervisors who need a practical understanding and an appreciation of workover practices. It explains how drilling and completion operations are planned and executed to meet all HSE objectives, maximize well productivity, and cater for future work over and intervention needs. HSE concepts and methods are presented together with down hole equipment, tools and their selection criteria.

Completion types and designs for vertical, horizontal and multilateral wells are covered, including down-hole equipment, tubing accessories, well head equipment and sub sea completions. The course also covers perforation techniques, well testing, wire-line and oiled tubing operations, reservoir stimulation and hydraulic fracture treatment – With selected case studies.

Course Objectives

After completing the course, the employee will:-

- Apply and gain systematic techniques in workover practices
- Design & monitor a high-level work over/completion strategy for wells in a variety of situations including recommendations for appropriate intervention strategy/equipment
- Analyze the Selection of tubing, packers, and completion flow control equipment for horizontal, multilateral, HPHT wells, etc. & plan for complex events
- Implement key features/applicability of the main sand control, fracpack and well stimulation options
- Recommend suitable measures to mitigate concerns for formation damage/skin removal
- Review of specialized fishing techniques involved in completion / workover jobs including slim hole fishing, coil tubing fishing etc.
- Analyze the Selection of tubing, packers, and completion flow control equipment for horizontal, multilateral, HPHT wells, etc. & plan for complex events
- Implement key features/applicability of the main sand control, fracpack and well stimulation options
- Recommend suitable measures to mitigate concerns for formation damage/ skin removal
- Review of specialized fishing techniques involved in completion / workover jobs including slim hole fishing, coil tubing fishing etc
- Discuss elements of reservoir characteristics and increase knowledge in understanding of rock properties
- Recognize tubing pressure losses of different rock & fluid properties and corrosion/erosion potential
- Correctly set and operate casings, tubing's and well head equipment
- Identify and consider wellbore, casing, tubing and packer issues on vertical, horizontal, and multilateral completions
- Discuss well integrity and HSE risks associated with perforation of oil and gas wells, including fishing, stimulation, fracturing, well testing and wire-line operations

Who Should Attend

This course provides an overview of all significant aspects and considerations of workover practices for drilling HSE specialists, drilling supervisors, petroleum & reservoir engineers, geologists, production and completion engineers and other supervisors who need to understand and apply HSE aspects of well completion and operation, well stimulation, work over and intervention.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- USA International Association for Continuing Education and Training (IACET)

  Haward Technology is an Authorized Training Provider by the International Association 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 1-2013 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 1-2013 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 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.

- 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.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Fee

As per proposal

Course Contents

- HSE in Workover and Drilling Operations
- Drilling History – Early Days
- The Beginning
- Drilling History – Modern Times
- Modern Times
- Uses of Oil
- Oil Around The World
- Hydrocarbon Reservoirs – Composition and Chemistry
- Formation of Hydrocarbons
- Reservoirs and Reservoir Rocks
- Formation of Reservoirs
- Origins of Formation Pressure
- Sedimentary Basins
- Sandstones
- Clay swelling
- Mud Stones
- Carbonates
- Porosity

- Permeability
- Reservoir Types
- Reservoirs Chemistry
- Hydrocarbons
- Hydrates
- Hydrocarbon Reservoirs – Properties and Flow Factors
- Hydrocarbons Properties
- Specific Gravity
- Viscosity
- Conditions
- Reservoir Types
- Reservoir Types – Dry Gas
- Reservoir Types – Wet Gas
- Reservoir Types – Gas Condensate
- Reservoir Types – Volatile Oil
- Reservoir Types – Black Oil
- Reservoir Types – Heavy Oil
- Reservoir Types – HP/HT
- Reservoir Types – Extra Heavy Oil
- Heavy Oil Recovery
- Steam Assisted Gravity Drainage
- Solvent Assisted Gravity Drainage
- Factors in Reservoir Flow
- The Production System
- Saturation
- Damage To Reservoir During Drilling
- Formation pressure loss
- Tubing pressure loss
- The Production System - How and Why Reservoir Production Drive Occurs
- The Production System
- Hydrocarbon Reservoirs – Surveys
- Lithographic Surveys
- Types of Survey

- Land
- Water
- Marine Reflection Shooting
- Magnetic Survey
- Gravity Survey
- Survey Results
- Gamma Ray Survey
- Gamma Ray Survey (LOG)
- Exploration & Appraisal
- Survey Results (CORE)
- Gas Reservoir Water Saturation Map
- Appraisal Survey
- Reservoir Drilling
- Drilling – Rig and Well Types
- Drilling Rig Types
- Land Rig
- Jack Up Rig
- Platform Rig
- Semi-Submersible
- Fully-Submersible!!
- Semi-Submersible
- Subsea BOP
- Drill Ship
- Types of Wells
- Wildcat
- Exploration
- Appraisal
- Production/Development
- Gas Injection
- Water Injection
- Sub Sea
- ARCO Sub-Sea Tree
- Sub-Sea Tree

- Talisman Horizontal Tree
- Nuggets GRP Structure
- FPSO
- FPSO Deck
- Drilling – Systems
- The People
- System Components
- Choice of System
- Power System
- Mud Circulation
- Hoisting System Components
- Main Drilling Rig Area
- Choice of System
- The Drilling Rig Draw Works
- Draw Works
- Rotating System
- Swivel Assembly
- Kelly
- Drill String Safety Valves
- Show Rotation Clip
- Top Drive
- Top Drive System
- Handling System
- Derrickman
- CT Rotating System
- Run Joint Break Out Clip
- Diamond Bits
- Reservoir Core Samples
- Special Bits
- Show Formation Protection Clip
- Drilling – Circulation
- Circulating System
- Storage Tanks and Pumps

- Mud Pumps
- Circulating System
- Good Housekeeping Prize
- Safe Storage Award
- Circulating System
- Mud Logging - Contract Proposal
- Formation Sampling and Analysis
- Cores
- Fluids
- Gas Detection Analysis: Evaluation
- H_2S Detection
- Drilling and Mud Parameters Measurements Monitoring
- Logs and Reports
- Lithology Column
- Gas and Oil Show Column
- Pressure Analysis
- Mud Logging Unit
- Equipment
- Drilling – Casing
- Drilling and Hole Casing
- Show Well Installation Clip
- Shallow Gas
- Well completion
- Formation Damage
- Formation Damage – Common Causes
- Scale Deposits
- Causes of Scaling
- Scale Removal Methods
- Water Soluble Scale
- Acid Soluble Scale
- Acid Soluble Iron Scale
- Acid Insoluble Scale
- Mechanical Removal Methods

- Drilling – Completions
- Completion Equipment and Design
- Tubing design
- Tubing Burst
- Tubing Collapse
- Tubing Tension
- Tubing and Completions
- Tubing and Completions
- Automated Safety Systems
- Well Completion
- Completions
- Tubing Installation
- Subsurface Safety Valves
- SSSV's
- Surface Controlled Sub Surface Safety Valve (SCSSSV)
- Sub Surface Safety Valve Operation
- Tubing and Completions
- SSSV Setting Depth
- Flow-Controlled Safety Valves (Down-hole Chokes)
- Bottom-hole Chokes and Regulators
- Tubing and Completions
- Sliding Sleeves
- Uses of Sliding Sleeves
- Side Pocket Mandrel
- Tubing Seating Nipples
- Purposes of Seating Nipples
- Selective Landing Nipples
- No-go Landing Nipples
- Tubing Plugs
- Show Plug Setting Clip
- Perforation Operations
- Perforation Objectives
- Jet Perforators

- Perforating Performance
- Perforation Depth Control and Orientation
- Expendable Shaped Charge Gun
- Wire-line Expendable Guns
- Perforation Damage
- Perforating
- Selection of Completion Fluids
- Production Packers
- Retrievable Packers
- Permanent Packers
- Permanent - Retrievable Packers
- Inflatable Packers
- Tubing / Packer Forces and Movement
- Factors Causing Packer Forces or Tubing Movement
- Ballooning Effects
- Tubing and Completions - Permanent Set Production Packer
- Removable Production Packer
- Tubing Anchors
- Dual pre-pack Production Screen
- Gravel Pack Screens
- Flow Couplings
- Multiple SPM Well Completion
- Multiple Zone Well Completion
- Dual Zone Well Completion
- Horizontal Well Completion
- Subsea Completion
- Production Lift Methods
- Formation Damage – Common Causes
- Drilling Damage
- Damaged Well Completion
- Sand Fill
- Wellhead and Casing
- Well Completion Xmas Trees

- Summary of Section
- Drilling - Well Control
- Drilling Operations
- Well Control Preparations
- BOP Drill
- Well Control Preparations
- Well Control Objectives
- Hydrostatic Pressure and Pressure Gradient
- Calculating Annular Capacity
- Causes of Loss of Circulation
- Well Control
- Well Kick Indications
- Kick Control Methods
- Drillers Method
- Wait & Weight
- Concurrent Method
- Bullheading
- Lubricate & Bleed Chart
- Well Control-Gas Bubble
- Relief Well
- Blow Out Preventers (BOP's)
- Hydril Annular Preventer
- Packing Unit (Donut)
- Choke Manifold
- Drilling – Hydraulics
- Well Liquid Hydraulics
- Well Hydraulics
- Specific Gravity
- Calculating Annular Capacity
- Calculate annular area by subtracting area of small circle from area of large circle
- API Gravity
- Gas Hydrostatic Pressure

- Gas Hydrostatic Pressure Introduction
- Correction Factor Table
- Gas + Liquid Hydrostatic Pressure
- Drilling - Well Workover
- Wells Policies and Procedures
- Policies & Procedures List
- Pre-Operation Checks
- Introduction
- Scope
- Definitions
- Ownership
- Policy
- Custody
- Transfer of Responsibilities
- Intervention Programme and Schedule
- Barriers
- Well Intervention Work
- Review and Amendment
- Well Workover
- Specific procedures
- Barriers
- Examples Of Mechanical Barriers
- Workover barriers
- Well Workover – Circulation
- Before Opening SSD
- SSD Open & THP Bled Down
- THP Reaches Zero
- Oil now at Surface
- Annulus Full
- Tubing Filled with Heavy Brine
- Annulus Filled with Kill Brine
- Prepare to Pull Plugs
- Pull Tubing from ELTSR

- Tubing Pulled
- Packer Milling OPS
- New Tubing Run
- Xmas Tree Installation
- Retrievable Test
- Treat & Squeeze Plug
- RTTS Plug
- Objectives of Well Test Team
- Well Site Well Testing
- Choke Manifold
- Separators
- Pressure Control
- Liquid control
- Liquid Flow Meters
- Turbine Meters
- Pilot Relief Valve
- Relief Valve
- Burners
- Well Testing
- Well-Test Reporting
- Drillstem Test
- Prestimulation and Poststimulation Tests
- Production Well (Potential) Test
- Drilling – Wireline
- Wireline Applications & Equipment
- Pre-Job Meeting
- Pre-Job Checks
- Compact Wireline Masts
- Wireline Tools
- Klein Clamp
- Wireline Tools - Basic Tool String
- Tear-Drop Rope Socket
- Jars

- Jarring Action and Knuckle-Joint
- Mechanical and Hydraulic Jars
- Quick-Lock - “User Friendly and Accident Free”
- Quick-Lock SYSTEM
- Production Tubing - Nipple Profiles
- Nipple Profiles and Keys
- Wireline Tools – Nipple Profiles
- Wireline Tools
- Fishing Grabs
- Pressure Control Equipment
- Tree Crossovers
- Otis and Bowen
- Hydraulic Stuffing Box
- Grease Injection Head
- Safety Check Union
- Wireline Lubricators
- Wireline Tool Catcher
- Hydraulic Tool Catcher
- Wireline Blow Out Preventers
- Depth Indicators
- Wire Line Bending Cycle
- Weight (Load) Indicators
- Drilling – Coiled Tubing
- Coiled Tubing Operations
- Coiled Tubing Description
- Coiled Tubing Unit (CTU) is made up of 5 components
- CTU is used for:
- CTU Injector Head
- CTU Drive Components
- Stripper Unit (Stuffing Box)
- CT Reel
- CT Applications
- Coiled Tubing Protection Devices

- Ball Operated Shearing Sub (BOSS)
- Multi-Function QUAD BOP
- RAM Sequence
- Combination BOP
- Coiled Tubing Failures & Remedies
- Stripper Failure
- Drilling – Fracture and Squeeze
- Hydraulic Fracturing Stimulation
- Four Steps of Fracture Treatment
- Surface Equipment Layout
- Fracturing Treatment Selection
- Selection of Base Fluid
- Basic Types of Fluids
- Potential Damage from Frac Fluid
- Selection of Gel System
- Formation Properties Affecting Growth Pattern of Hydraulic Fractures
- Hydraulic Fracturing Fluids
- Storage and Mixing Requirements
- Squeeze Cementing
- Purposes of Squeeze Cementing
- Squeeze Terminology
- Squeeze Pressure
- The "high-pressure" technique
- The 'low-pressure" technique
- Fracture Gradient
- Fracture Propagation
- Bottom-Hole Treating Pressure
- Block Squeezing
- Breakdown Pressure
- Braden head squeeze method
- Squeeze-packer Method
- Squeeze Pressure Requirements
- Squeezing Fractured Zones

- Slurry Design
- Drillable Packers
- Testing Squeeze Jobs
- Summary
- Drilling - Environmental Aspects and Impacts
- Aspects Identification
- Likelihood Evaluation of the Identified Aspect
- Factors that might have an effect on the conditions may include:
- Control
- Nature of Substance
- Frequency
- Consequence Evaluation
- Criteria for Health and Safety
- Drilling - Plan of Development (POD)
- Well Drilling, Workover, and Completion Planning
- Drilling Project - Zorba and Ajada Fields Plan Of Development (POD)
- Completions
- Workovers - Abandonments - Decommissioning
- Drilling Project - Zorba and Ajada Fields Plan Of Development (POD) – Addendum
- Environmental Management Plan (EMP) - Contract Invitations To Tender (ITT)
- Rig Safety Inspection - Scope Of Work
- Description of Rig Equipment & Systems Inspections
- Drilling Equipment and Major Components