COURSE OVERVIEW DE0288
Recognizing Well Intervention Opportunities (E-Learning Module)

Course Title
Recognizing Well Intervention Opportunities (E-Learning Module)

Course Reference
DE0288

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

This E-Learning course is designed to provide participants with a detailed and up-to-date overview of well intervention opportunities. It covers the applications and units of coiled tubing; the parts of a reel including injector head, control cabin, power pack, stripper, blowout preventer, bottom hole assembly, connecter, check valves, disconnect tools, circulation valve, quick connects and centralizers; the coiled tubing technology, well control equipment and raw material for CT; the CT mechanical performance, string design and inspection tools; the repairs and splicing, workover, completion applications and common CT worker applications; the drilling and pipeline applications; the removal of sand or fill from a wellbore; unloading a well with nitrogen and fracturing/acidizing; overcoming of pipeline drag limitations and permanent installations; and the buckling of coiled tubing and truck-mounted coiled tubing reel assembly.

During this course, participants will learn the hydraulic coiled tubing unit; the factors affecting fracture growth, the principles of formation fracturing and reservoir stimulation, primary stresses and fracturing facilities around wellhead; the process of hydraulic fracturing and the limits of a fracture's growth; the pressure drop across perforations and additives commonly used in the fracturing solution; the effect of fracture job on well productivity and recovery of fracture cost; the acid fracture simulation, acids used in fracturing and additives used; and the design of well screen, location and length of the screen, size and shape of slots, screen diameter and screen material.

Course Objectives

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

- Apply and gain an in-depth knowledge on well intervention opportunities
- Discuss coiled tubing including its applications and units
- Recognize the parts of a reel including injector head, control cabin, power pack, stripper, blowout preventer, bottom hole assembly, connecter, check valves, disconnect tools, circulation valve, quick connects and centralizers
- Discuss coiled tubing technology and identify well control equipment and raw material for CT
- Review CT mechanical performance and string design as well as utilize CT inspection tools
- Employ repairs and splicing, workover, completion applications and common CT worker applications
- Carryout drilling applications, pipeline applications, removal of sand or fill from a wellbore, unloading a well with nitrogen and fracturing/acidizing
- Overcome pipeline drag limitations and apply permanent installations
- Prevent buckling of coiled tubing and carryout truck-mounted coiled tubing reel assembly
- Recognize hydraulic coiled tubing unit, and employ sidetrack procedure and coil tubing drilling on the north slope
- Identify the factors affecting fracture growth and discuss the principles of formation fracturing and reservoir stimulation as well as illustrate primary stresses and fracturing facilities around wellhead
- Describe the process of hydraulic fracturing and determine the limits of a fracture's growth
- Recognize pressure drop across perforations and apply additives commonly used in the fracturing solution
- Determine the effect of fracture job on well productivity and carryout recovery of fracture cost
- Discuss acid fracture simulation, acids used in fracturing, additives used, applications and acid fracturing
- Illustrate design of well screen, location and length of the screen, size and shape of slots, screen diameter and screen material

Who Should Attend

This course provides an overview of all significant aspects and considerations of well intervention opportunities for well and senior petroleum engineers, drilling and senior drilling supervisors, reservoir and senior reservoir engineers, geologists, production and completion engineers and supervisors needing a practical understanding and an appreciation of well completion design and operation, well stimulation and work over planning.

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

- What is Coiled Tubing?
- Application of Coiled Tubing?
- Coiled Tubing Unit
- Reel
- Injector Head
- Control Cabin
- Power Pack
- Stripper
- Blowout preventer
- Bottom Hole Assembly (BHA)
- Connecter
- Check valves
- Disconnect tools
- Circulation valve
- Quick connects
- Centralizers
- Coiled Tubing Technology

- What is CT
- Detailed Photos of CT Unit Key Elements
- Well Control Equipment
- Quiz -1
- Quiz -2
- Quiz -3
- Quiz -4
- Quiz -5
- Quiz -6
- Quiz -7
- Quiz -8
- History
- Quiz -9
- Photos of Various Offshore CT Operating Environments
- The Business
- New Ct Markets/Field Applications
- CT Service Providers
- The Tubing
- Raw Material for CT
- CT Manufacturing
- CT Mechanical Performance
- CT String Design
- Quiz -10
- Quiz -11
- CT Inspection Tools
- Repairs and Splicing
- Alternatives to Carbon Steel CT
- Quiz -12
- Workover & Completion Applications
- Common CT Workover Applications
- Removing Sand or Fill from a Wellbore
- Quiz -13
- Quiz -14

- Quiz -15
- Unloading a Well with Nitrogen
- Fracturing / Acidizing a Formation
- Quiz -16
- Drilling Applications
- Non-Directional Wells
- Directional Wells
- Quiz -17
- Wellbore Hydraulics and Wellbore Fluids
- Overbalanced CTD
- Exercise - 1
- Investigation
- Quiz -18
- Underbalanced CTD
- Pipeline Applications
- Land
- Offshore
- Limitations
- Overcoming Pipeline Drag Limitations
- Permanent Installations
- Offshore Flowlines
- Velocity Strings
- Control Lines
- Nomenclature
- Coiled Tubing
- Buckling of Coiled Tubing
- Truck-Mounted Coiled Tubing Reel Assembly
- Coiled Tubing Reel Assembly
- Hydraulic Coiled Tubing Unit
- Some Applications of Coiled Tubing
- Sidetrack Procedure
- Coil Tubing Drilling on the North Slope
- Advantages

- Disadvantages
- Sinusoidal Buckling in a Horizontal Wellbore
- Sinusoidal Buckling Load
- Helical Buckling in a Horizontal Wellbore
- General Equation
- Buckling in Vertical Wellbores
- Buckling of 2” x 1.688” CT
- Hydraulic Stimulation Fracturing
- What is Hydraulic Fracturing?
- Reservoir Rocks
- Permeability and Rocks
- Fracture View
- Factors Affecting Fracture Growth
- Principles of Formation Fracturing
- Reservoir Stimulation, Illustrating Primary Stresses
- Fracturing Facilities Around Wellhead
- Process of Hydraulic Fracturing
- What limits a fracture’s growth?
- Perforations Position
- Pressure Drop Across Perforations
- Additives commonly used in the fracturing Solution
- Proppant Form
- Selected Triplex Pump
- Effect of Fracture Job on Well Productivity
- Recovery of Fracture Cost
- Acid Fracturing
- Motive for Fracturing
- What is Acid Fracturing?
- Etched fracture length
- Acid fracture Simulation
- The Challenge
- Acids Used in fracturing
- Additives Used

- Applications
- Acid Fracturing
- Introduction
- Well Diameter
- Well Depth
- Design of Well Screen
- Location and Length of the Screen
- Size and Shape of Slots
- Screen Diameter
- Screen Material
- Corrosion Resisting Metals (Source: Raghunath, 2007)
- Type of Screens
- Design of Gravel Pack
- Natural Gravel Pack
- Artificial Gravel Pack
- Vertical Cross-Section of a Gravel-Packed Well
- Design of Tubewells: An Example
- Results of the Sieve Analysis
- Tubewell in the Confined Aquifer
- Hydraulic Workover & Snubbing Solutions
- History of Hydraulic Workover
- Definition of Snubbing
- Reasons for Utilizing HWO
- Benefits of HWO Services
- Misconceptions for Using HWO Services
- Hydraulic Workover Unit
- Components of HWO Unit
- Workbasket
- Control Panel
- Traveling and Stationary Slips
- Hydraulic Jack Assembly
- Rotary Table
- Power Tongs

- Hydraulic Power Pack, Accessories and Hydraulic Hoses
- Circulating Swivel, Kelly Hose and Pumps
- Hydraulic Workover “Basic Jack”
- Stand Alone Units
- HWO Stand Alone Unit Specs
- Snubbing Unit in Drilling Rig
- 460k HWO System
- Applications
- Solids Removal
- Drilling – Extended Reach
- Plug and Abandonment
- Completion Operations, Live/Dead, Single or Dual
- Recompletions and Workover, Live or Dead Well
- Mechanics of Hydraulic Workover
- Mechanics of Hydraulic HWO
- Mechanics of Hydraulic Workover
- Ram to Ram HWO Procedures
- Engineering
- Theory
- Engineering Calculations for HWO Applications
- Calculations
- Example Snub Force Calculation
- Frictional Forces
- Total Snub Force
- Tri-axial Stress
- Von Mises Distortion Energy Theory
- Buoyancy
- Required Hydraulic Pressure
- Pipe Buckling- Inelastic/Elastic
- Engineering Calculations for HWO Applications
- Downhole Tools for HWO
- Backpressure Valves
- Bottomhole Assembly (BHA)

- Workstring
- Workstring Connections
- Stabbing Valves (TIW)
- Why Safety is such a Concern?
- Designing a Job
- Safety / Escape Devices