

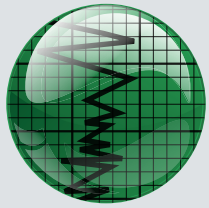
TRAINING

2010 PRODUCTION OPTIMIZATION SOFTWARE TRAINING PROGRAM





Drilling



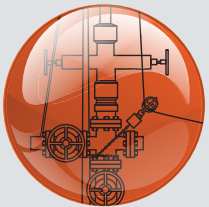
Evaluation



Completion



Production



Intervention

About this Catalog

It is our pleasure to present to you the 2010 Production Optimization Software Training Course schedule. Inside you will find information that will aid you in searching, selecting and registering for an appropriate training course to meet both your personal development and technical requirements.

Weatherford is committed to providing useful and practical training to professionals in a variety of formats. If you would like to obtain further information on any of these courses or other training opportunities, then please contact us directly or through your regional Weatherford representative.



Weatherford[®]

TRAINING

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Registration Forms and Contact Information

Build production optimization knowledge.



Information regarding our production optimization training can be obtained by contacting us directly at (1) 832.201.4200, (44) 131.449.4536 or ep-weatherford.com/training.

Weatherford's production optimization group offers software, hardware, training and services to operators across the globe for flowing wells and all forms of artificial lift. Training classes include petroleum engineering and best practices education, plus specific software product training. Commercial classes are offered as open classes at Weatherford training centers and offices in key cities globally including Edinburgh, Aberdeen, Houston, Calgary, Bakersfield, Dubai and Kuala Lumpur. Courses can also be presented at customer facilities and tailored to meet a specific requirement or application.

All courses are presented by qualified working engineers and specialists, each of whom has significant experience working for an operation or service company. Our product training courses feature a combination of theoretical knowledge and practical skills. The result is that each attendee leaves the course with basic instruction in the operation and navigation of the software package and practical examples that illustrate the program's functionality. See the software training schedule and course location list available at ep-weatherford.com/training. You will also find specific details and complete course descriptions.

PRODUCTION SOFTWARE TRAINING

Boost your total field performance.



Drilling | Evaluation | Completion | **Production** | Intervention

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Training Overview

Weatherford has developed a comprehensive training program to ensure maximum benefit from our production optimization applications and software. Our training courses are widely recognized as a key element of technology transfer ensuring the sustainability of performance improvements achieved via the implementation of software and services.

Each course features a number of real-world examples, which vary from hand calculations to the use of interactive software packages. The courses are characterized by their practical engineering nature as well as their theoretical content. The courses are presented by qualified engineers, each of whom has an established reputation in teaching petroleum engineering as well as retaining a fully operational role in current production optimization projects.

On-Site Training

Any one of Weatherford's production optimization training courses can be provided at your location which offers a cost efficient and versatile method for training a large group of individuals within an organization. The timing of in-house courses is flexible in order to accommodate the client's requirements and often the content of the course can be tailored to meet a specific requirement or application.

In addition, customers can invite individuals from other companies to participate in the on-site training courses. This option of "sponsoring" a course reduces the costs.

For additional information on any training program contact us at



General Information

How to Register

Go to _____ to register online. From the course listing click the Register button next to the course you would like to attend to start the registration process. To register offline, click the PDF Form button next to the course you would like to attend to download the registration form or use the appropriate one located in the back of this catalog. After filling out the registration document fax or mail it back to our offices. Please make bookings as early as possible, and certainly at least four weeks before the course begins.

The course fees (when available) are indicated against each course and on the registration form. The course fee includes trial software license (where applicable), manuals and documentation, lunches, and the course dinner on the Thursday evening. Users are encouraged to bring their laptops when indicated.

Payment for courses should be made in advance. This can be done by sending a check with the application form, providing a credit card number with your registration, or alternatively an invoice can be issued provided that a work order or purchase order reference has been supplied by the candidate or his company. Without payment, enrollment on the course cannot and will not be confirmed.

Travel, meals (with the exception of lunch), and accommodation expenses are the responsibility of the attendee.

Should it be necessary for an individual to cancel an enrollment, the full fee less an administration fee (5%) will be refunded provided that the cancellation is received in writing 21 days prior to the start of the course. No refunds will be made for cancellations received less than 21 days before the course begins, but companies are free to transfer the registration to another employee.

Should an individual wish to cancel a booked course in favor of another software course within the same calendar year and of the same duration, then there is no administration charge provided we receive the notification in writing at least 21 days prior to the start of whichever course commences first. If the change of course is requested within 21 days prior to the start of whichever course commences first, we reserve the right to charge an additional 5% administration fee.

If an individual wishes to transfer to a course in a following calendar year and there has been an increase in fees, then payment of the difference shall be made to us prior to the commencement of the course. No other transfer options are available.

Weatherford reserves the right to cancel a course for reasons of insufficient registration or force majeure, in which case any payments made will be fully refunded.

2010 Training Schedule

Location	Dates	Price	Course Title	Registration Form
Houston	January 18–22	\$1000		
Calgary	February 8–12	CAD2000		
Kuala Lumpur, Malaysia	February 22–26	\$2500		
Houston	March 8–12	\$1800		
Kuala Lumpur, Malaysia	March 22–26	\$2500		
Calgary	March 22–26	CAD1500		
Houston	April 5–9	\$1800		
Edinburgh	April 12–16	£1550		
Edinburgh	April 19–23	£1550		
Calgary	April 19–23	CAD2500		
Houston	May 3–7	\$2000		
Edinburgh	May 10–14	£1550		
Calgary	May 17–21	CAD1500		
Kuala Lumpur, Malaysia	June 7–11	\$2500		
Houston	June 7–11	\$2500		
Edinburgh	July 26–30	£1550		
Edinburgh	August 2–6	£1550		
Edinburgh	August 16–20	£1550		
Houston	August 16–20	\$1000		
Calgary	August 30–September 3	CAD2000		
Edinburgh	September 6–10	£1550		
Edinburgh	September 13–17	£1550		
Houston	September 13–17	\$1800		
Calgary	September 27–October 1	CAD2500		
Houston	October 11–15	\$1800		

Additional courses may be scheduled regionally across the globe. Check most accurate course schedule available.

for the latest

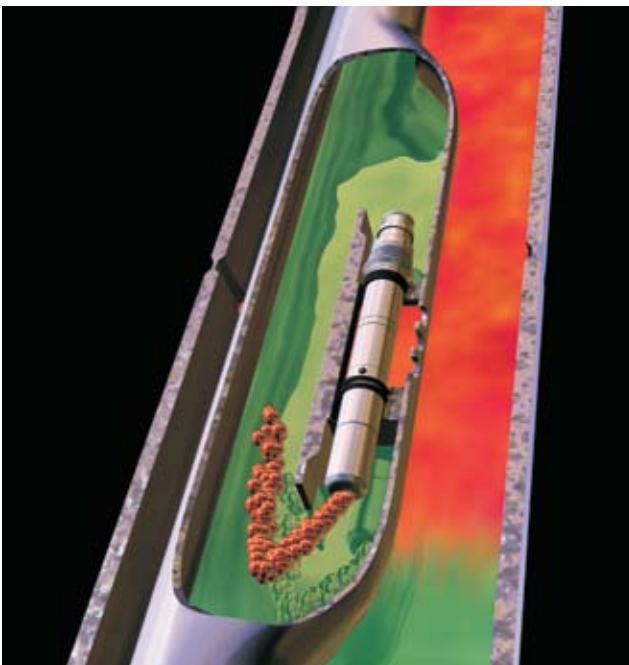
Course Overview

Advanced Gas Lift Design

Stated quite simply, the objective of this course is to provide the most advanced and comprehensive gas lift design and diagnostics training package available to the industry. The course provides a comprehensive review of common gas lift techniques and concentrates on the downhole aspects of gas lift performance and diagnostics. It also emphasizes emerging technology in the form of actual gas lift valve performance and dynamic gas lift simulation, which advance the practice of gas lift from a black art to a true engineering discipline. The course is targeted toward engineering staff involved in the design, performance, and monitoring of gas lift installations. While previous experience or knowledge of gas lift are not prerequisites, students are expected to be familiar with the basic principles of well modeling and nodal analysis. The course will also prove valuable to experienced gas lift engineers who would benefit from exposure to some of the newer methods currently being developed and tested by the industry.

Course Description

The course begins with a quick overview of production systems analysis and justification of gas lift as a means of increasing well productivity, followed by an introduction to gas lift principles, surface installations, and downhole equipment. The three basic elements of continuous gas lift design are covered thoroughly: operating valve positioning, unloading valve positioning, and valve sizing. Actual, detailed valve performance is examined, with an overview of methods and techniques used to predict valve behavior under actual flowing conditions. This forms the basis for modeling and analyzing problematic gas lift behavior using **DynaLift™** software, a proprietary program developed by Weatherford in association with Decker Technologies. Other topics covered in the course include gas lift operations, multi well gas lift allocation and optimization, as well as a special section devoted entirely to intermittent gas lift.



Course Contents

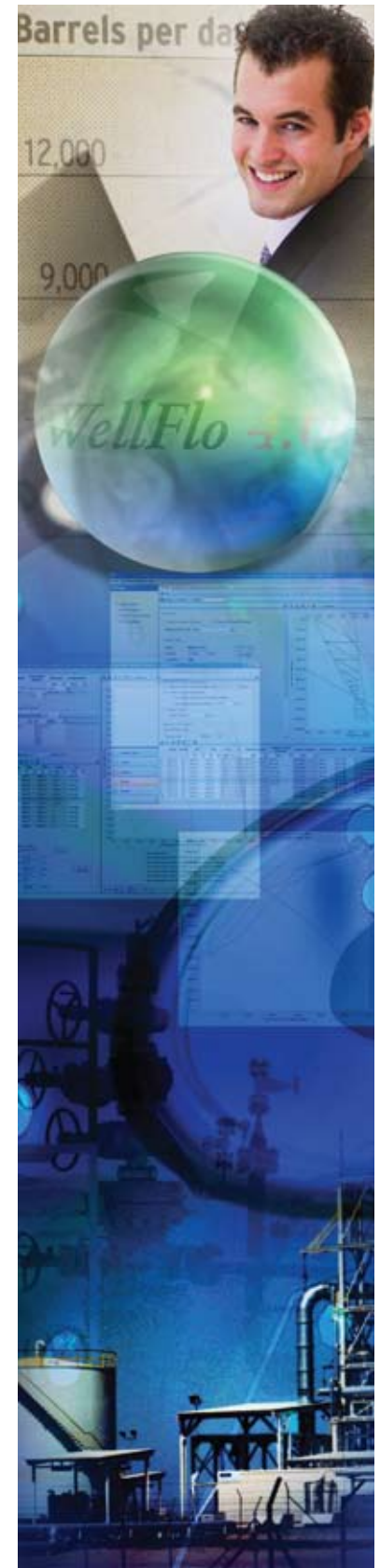
- The production system
- Introduction to gas lift
- Gas lift design: positioning the operating valve
- Gas lift design: positioning the unloading valves
- Gas lift design: valve sizing
- Valve performance
- Gas lift operations
- Lift gas allocation and production optimization
- Gas lift troubleshooting
- Intermittent gas lift

Advanced Gas Reservoir Engineering

The course is intended for reservoir and petroleum engineers, geologists, and others interested in the behavior and performance of gas and gas condensate reservoirs. Particular emphasis is placed on gas condensates and reservoir performance.

Course Description

Participants will gain excellent experience in solving reservoir engineering calculations through the use of many practical examples. Use will be made of the Weatherford *PanSystem* and *WellFlo* software tools during the presentations and practical sessions.



Course Contents

- Classical material balance
- Inflow performance
- Gas condensates
- Gas well test analysis
- Horizontal wells
- Temperature modeling
- PVT modeling
- Vertical lift
- Complex material balance
- Well completions
- Reservoir monitoring RFT, MDT
- Super wells

“Good basic intro to gas reservoir engineering, good instructor, pleasant venue”

BP

Course Overview

Advanced Production Optimization

This advanced level course is aimed at experienced production engineers seeking an update to the new methodologies available for maximizing production from oil fields under artificial lift. A familiarity with conventional nodal analysis methods and design techniques for gas lift and electrical submersible pump systems will be assumed. The course will include the sequential linear programming method as implemented in the *ReO* software package.

Course Description

The course is based on case studies of actual field optimization and is aimed at allowing engineers to realize the typical target of 5-10% increase in production rate usually achievable by constructing and optimizing a *ReO* production model.

Course Contents

- Mechanistic models of multiphase flow and heat transfer
- Specification and solution of network problems
- Gas compression
- Sequential linear programming
- Advanced gas lift
- Advanced electrical submersible pump (ESP) systems
- Smart wells

Advanced Well Test Analysis

This is an advanced level course designed for petroleum and reservoir engineers who may be required to interpret non-routine well tests. It is advisable to have already attended the Well Test Analysis, Well Test Analysis in Complex Reservoirs or Well Test Analysis Using *PanSystem* Software course.

Course Description

The course provides many examples from all over the world which are used to illustrate the various techniques. Participants will take from the course clear and systematic methodologies to tackle the more demanding types of well tests commonly encountered.

Course Contents

- Horizontal wells
- Extended drawdown testing
- Permanent downhole gauges (PDHG)
- Post hydraulic fracture analysis
- Slug test analysis
- Injection wells
- Gas condensate wells

“Knowledge of the instructor and the ease with which he made us understand things was great.”

Enron Oil and Gas India Ltd.

Awareness of Production Automation

This high level course provides a basic introduction to each form of artificial lift and its associated production automation system. People who take this course will gain a strong appreciation of the purposes and value of these systems, and the equipment and staffing needed to implement and support these systems.

Who Would Benefit From This Course?

- Any person who is involved in oil or gas field production operations that use automation and artificial lift systems should have this basic level of competency as a minimum
- Typically, this level of competency is sufficient for managers or supervisors who oversee production operations that use automation and artificial lift systems
- Those who are interested or involved in oil or gas field production operations that currently do or may use automation and artificial lift systems
- Those who need to have a basic level of competency in the subject
- Those who oversee production operations that use automation and artificial lift systems
- It is not sufficient for persons who are directly involved in performing or supervising others who perform production automation or artificial lift operations including selection, design, installation, operation, optimization, troubleshooting, and surveillance of automation and artificial lift operations

What Will You Gain From This Course?

- The purposes of production automation for artificial lift and operations
- The value of these systems
- The equipment and staffing needed to implement and support these systems
- The importance of properly equipping, staffing, planning, and training to support these systems

Course Contents

- Automation history
- State-of-the-art
- Automation objectives
- Automation applications
- Justification, notional costs
- Components
- Staffing
- Training
- Project planning
- Automation trends
- Automation exercise
- Questions and answers
- Course exam
- Aware competency level certification process

Course Overview

Case Software Applications

Automation/Analysis Software

This class provides an overview of all the software application modules. Since the interface of the different modules is very similar, one class covers the basics of navigating around the application screens.

Estimated class time: One day

Administrator Software

The administrator training provides the system manager with the skills necessary to add user accounts, implement security, modify reports, and customize static and dynamic well groups. Other topics covered include file/directory structure, underlying application processes, setting poll schedules, and system troubleshooting.

Estimated class time: Two days

ESP Software

By attending this class, the students learn to use the ESP module to:

- Configure/add ESP wells
- Use monitor, status, and control features
- Group wells by alarm type, exceptions or attributes
- Display electric motor trends
- Generate reports

Estimated class time: Two days

Injection Well Software

The attendees of this class will learn to use our injection well application to operate their injection wells including:

- Configure/add injection wells
- Display status, trends, and reports
- Set deviation alarms
- Set up the controller remotely

Estimated class time: Half day

Monitoring Software

In this class, users will learn to:

- Configure and monitor pressure, temperature and quality sensors
- Configure/add an RTU
- Configure/manage alarms
- Configure analog, discrete, calculated and meter points
- Use trend charts and reports

Estimated class time: One day

Production Operations Software

This class provides students with the skills needed to use our production application effectively including:

- Configure/add facilities and tanks
- Configure and link analog, discrete and meter points
- Use trend charts and reports
- Model the field
- Analyze production anomalies
- Shrinkage analysis
- Nomination tracking
- G-10 reports

Estimated class time: One day

Rod Pumping Software

This class provides the attendee with the skills to use the rod pumping modules to:

- Configure/add rod pumping wells
- Configure analog, digital and meter points
- Group wells
- Display surface cards
- Analyze cards
- Save/restore cards
- Poll on demand
- Refresh host/controller values
- Basic downhole analysis
- Rod pump design and optimization

Estimated class time: Two days

Well Test Software

This class provides the student with the ability to:

- Configure/add wells, separators and headers
- Setup automatic or manual test procedures
- Measure, display and report test results
- View well test history and trend data
- Import/export well test data
- Well sequencing
- Well test evaluation
- Manual well test entry

Estimated class time: Half day

LOWIS 5.0 Administration Training

The course is intended for system administrators and support engineers who are involved in the set up and support of a *LOWIS* server.

Course Description

The administrator training provides the system manager with the skills necessary to add user accounts, implement security, modify reports and customize static and dynamic well groups. Other topics covered include file/directory structure, underlying application processes, setting poll schedules and system troubleshooting.

Course Contents

- Basic course
 - Server architecture and folder structure
 - csAdmin tool and gauge off
 - Licensing
 - Website configuration (IIS configuration and setup)
 - User security
 - *LOWIS* Admin tool
 - Backup/restoration and staging servers
 - *LOWIS* client installation and setup
 - Troubleshooting common issues
- Advanced topics
 - Bfile and MsqI
 - Communications
 - Customization
 - Upgrade process (generic)
 - Export/import (integration)
 - Server-side debugging
 - *LOWIS* web reports configuration
 - Scripting

LOWIS WSM User Training

The fundamentals of well service management (WSM) course is part of the *LOWIS* software training series and provides students with a basic understanding of *LOWIS* tools and techniques used for well service management. As a student, you will learn the fundamental skills for managing wells and the services necessary to maintain those wells during their production lifetime. During the course, you will learn how to build and maintain wells; plan, execute and track service jobs and events; generate reports and perform analysis; as well as, create and modify well bore diagrams that document the state of the wellbore at different stages of the well lifecycle.

Course Description

The course is aimed at individuals with limited *LOWIS* software experience. The emphasis of this course is to teach you how to use software tools and features found in *LOWIS* software and complete specific tasks related to well service management. During the course, you will learn basic concepts and steps to complete these tasks. You will also view demonstrations of the tools and concepts being applied to real world conditions. Finally, you will work hands on with the *LOWIS* software to complete exercises and projects that will reinforce what you have been taught and enhance your learning experience.

Course Contents

- Well service management fundamentals
- Working with the job plan wizard
- Managing job backlogs
- Managing pull tickets
- Document management
- Working with the tour sheet wizard
- Working with scorecards
- Managing wellbores
- Managing wellbore diagrams
- Applying the concepts: Class project

Course Overview

Knowledge of Production Automation

This course provides a thorough introduction to each form of artificial lift and its associated production automation system. It includes a more detailed understanding of production automation and artificial lift technology and operations. People who take this course will gain a strong appreciation of the value of these systems and the equipment, staffing, training, coordination, and supervision necessary to implement, maintain, and operate production automation systems for artificial lift. They will learn how to select, motivate, and evaluate the staff that operates these systems.

Who Would Benefit From This Course?

- Typically, this level of competency is required for any person who is directly involved in supervising production automation and artificial lift engineering or operations, including selection, design, installation, operation, optimization, troubleshooting, and surveillance of automation and artificial lift equipment and/or operations.
- This course should be taken by personnel who provide direct supervision to staff who are actually involved in hands-on work with automation systems for artificial lift and production operations.
- Those who are interested or involved in oil or gas field production operations that currently do or may use production automation and artificial lift systems
- Those who need to have a basic level of competency in the subject
- Those who oversee production operations that use automation and artificial lift systems
- It is not sufficient for any person who is actually performing these operations

What Will You Gain From This Course?

- The purposes of production automation for artificial lift and operations
- The value of these systems
- The equipment and staffing needed to implement and support these systems
- The importance of properly equipping, staffing, planning, and training to support these systems

Course Contents

- Production automation certification process
- Purpose of the course
- Production automation
- Production automation applications
- Value of production automation
- Components
- Costs
- Justification
- Life cycle of automation systems
- Project management
- Staff requirements
- Staff development
- Making the most of automation systems
- Case histories
- Questions and answers
- Knowledgeable competency level certification process

***PanSystem* and *PanMesh* User Training**

This course provides an introduction to EPS well test (pressure transient test) interpretation software and covers both *PanSystem* (analytical models) and *PanMesh* (numerical models) software. At the end of the course the student will be capable of: importing raw sensor data; preparing data for analysis; using all the analytical methods; selecting an appropriate reservoir model; ascertaining reservoir parameters for the model; and generating a simulated response to compare with actual data.

Course Description

The course focuses on training in use of the software, not on the underlying engineering concepts. It is therefore important that attendees have at least a basic knowledge of well test analysis techniques and methods. The main topics will be covered with a brief refresher on the underlying principles. The course is designed for engineers who intend to use *PanSystem* software to analyze and design well tests.

Attendees will become familiar with *PanSystem* software by using the software on a series of worked examples, covering data preparation, basic analysis and a set of the most common well and reservoir analysis models.

Course Contents

- Data preparation through analysis
- Basic analysis workflow
- Faults and boundaries
- Variable wellbore storage, non-uniqueness of models
- Closed reservoirs
- Horizontal wells analysis
- Basic gas well test analysis
- Inflow performance and production forecasting
- Partial completions
- Hydraulically fractured wells
- Basic numerical analysis with *PanMesh* software
- Pinch-out numerical analysis
- Boundaries and heterogeneities numerical analysis
- Interference tests numerical analysis
- Layered horizontal well numerical analysis

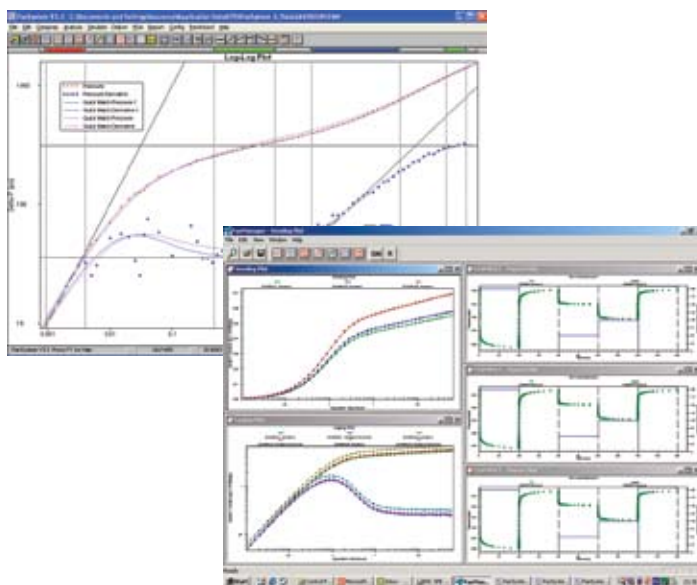
Additional Information

Except for the Edinburgh location, attendees need to bring their own laptop with local administrator's privileges to install *PanSystem* software.

Course Overview

PanSystem User Workshop

In the case of a client who wishes to examine data relevant to their own operations, Weatherford recommends the *PanSystem* workshop, a five-day seminar which can be tailored to use the client's well test data. The objective of this course is to assist users of *PanSystem* software to analyze well test data from their own fields. In order to achieve this goal, the course is presented in a seminar fashion, where engineers are guided through the different stages of well test analysis using the software. Two days will be spent reviewing *PanSystem* software and the remaining three on analyzing previously prepared client data. Time can also be spent doing one-on-one training during the second part of the workshop. The client will furnish data used in this workshop and hence the quantity and quality of the data available will dictate the conduct of the course.



Production Logging

The course is designed for engineers and other technical personnel who are involved at any stage in the specification, acquisition or interpretation of cased-hole wireline measurements. The course aims to provide a practical understanding of the physical phenomena involved, measurement principles, equipment types and the analysis of production logging surveys.

Course Description

The course covers the practical and theoretical aspects of modern production logging operations in terms of tool selection and data requirements, measurement limitations, analysis and its pitfalls. In the practical sessions, real field data is analyzed and the results discussed in depth.

Course Contents

- Introduction
- Flow rate measurement
- Fluid identification
- Temperature measurement
- Pressure measurement
- Calliper, gamma ray, CCL, and depth control: modern production logging toolstrings
- Two phase flow
- Miscellaneous sensors

“A very good overview of PLT interpretation techniques. Excellent instructor, pace of delivery fine.”

BHP

Production Optimization Using Systems Analysis

This course is intended for well analysts, artificial lift engineers, production engineers, and other technical personnel who are involved in the analysis and design of naturally flowing oil wells, gas wells, and high rate artificial lift systems such as gas lift and electric submersible pumping systems.

Course Description

The course provides practical instructions on design and analysis of naturally flowing oil and gas wells, as well as gas lift and electric submersible pumping systems based on systems analysis—also known as nodal analysis—concepts. Practical problems are solved using the *WellFlo* software package. Upon completion of this course, you should be able to:

- Explain major factors in artificial lift selection process
- Analyze cessation of natural flowing period of an oil well
- Identify conditions in which a gas well will cease to flow due to liquid loading
- Identify components of a gas lift and an ESP system
- Design and analyze gas lift and an ESP system
- Use *WellFlo* software to:
 - Develop a well model for a well under naturally flowing, gas lift or ESP conditions
 - Conduct sensitivity analysis on various components of well system for a robust design
 - Adjust input parameters based on field measurements

Course Contents

- Production optimization
- Need for and selection of artificial lift methods
- Gas lift system components
- ESP system components
- *WellFlo* software introduction
- Systems analysis for flowing wells
- Gas lift wells
- ESP wells
- Preliminary automation concepts
- Network optimization basics

Additional Information

Except for the Edinburgh location, attendees need to bring their own laptop with local administrator's privileges to install *WellFlo* software.

Course Overview

Real-Time Production Optimization of Beam Wells

This course is intended for well analysts, artificial lift analysts, production engineers, and other technical personnel who are involved in optimization of reciprocating sucker rod pumping systems using *LOWIS* software. The course aims to provide a practical understanding of capabilities created by the software in managing sucker rod pump (SRP) well performance.

Course Description

The course covers practical aspects of automation concepts as applied to sucker rod pumping systems. Upon completion of this course, you should be able to:

- Understand basic concepts of automation and how it is used in an oil field
- Explain basic components of a reciprocating sucker rod pumping system
- Explain underlying theory behind well performance applicable to SRP wells
- Understand surveillance and optimization concepts applicable to SRP systems
- Explain the importance of well tests and how to use them to diagnose problems with SRP wells
- Use *LOWIS* software to:
 - Configure an SRP well for data capture from an automation system
 - Monitor well performance
 - Analyze SRP well performance using real time measurements
 - Validate a well test based on results of analysis

Course Contents

- Automation basics: terminology, devices used, field sensing devices
- Basic components of a sucker rod pumping system
- Inflow and outflow performance as applicable to SRP wells
- *LOWIS* software introduction
- SRP well surveillance
- SRP performance analysis and interpretation of dynamometer cards
- Well testing methodology and test data interpretation for SRP wells

Additional Information

This 3½ days long course is not an open course. It is presented onsite at client locations using live data on existing *LOWIS* systems and may be tailored to suit client needs. For more information on this course or to schedule a session at your facility, please contact a Weatherford representative.

Real-Time Production Optimization of ESP Wells

This course is intended for well analysts, artificial lift analysts, production engineers, and other technical personnel who are involved in optimization of electric submersible pumping systems using *LOWIS* software. The course aims to provide a practical understanding of capabilities created by the software to manage ESP well performance.

Course Description

The course covers practical aspects of automation concepts as applied to ESP systems. Upon completion of this course, you should be able to:

- Understand basic concepts of automation and how it is used in an oil field
- Explain basic components of an ESP system
- Explain underlying theory behind well performance applicable to ESP wells
- Understand surveillance and optimization concepts applicable to ESP systems
- Explain the importance of well tests and how to use them to diagnose problems with ESP wells
- Use *LOWIS* software to:
 - Configure an ESP well for data capture from an automation system
 - Monitor well performance
 - Analyze ESP well performance using real-time measurements
 - Validate a well test based on results of analysis

Course Contents

- Automation basics: terminology, devices used, field sensing devices
- Basic components of an ESP well
- Inflow and outflow performance as applicable to ESP wells
- *LOWIS* software introduction
- ESP well surveillance
- ESP performance analysis
- Well testing methodology and test data interpretation for ESP wells

Additional Information

This 3½ days long course is not an open course. It is presented onsite at client locations using live data on existing *LOWIS* systems and may be tailored to suit client needs. For more information on this course or to schedule a session at your facility, please contact a Weatherford representative.

Course Overview

Real-Time Production Optimization of PCP Wells

This course is intended for well analysts, artificial lift analysts, production engineers, and other technical personnel who are involved in optimization of progressing cavity pumping (PCP) systems using *LOWIS* software. The course aims to provide a practical understanding of capabilities created by the software to manage PCP well performance.

Course Description

The course covers practical aspects of automation concepts as applied to PCP systems. Upon completion of this course, you should be able to:

- Understand basic concepts of automation and how it is used in an oil field
- Explain basic components of a PCP system
- Explain underlying theory behind well performance applicable to PCP wells
- Understand surveillance and optimization concepts applicable to PCP systems
- Explain the importance of well tests and how to use them to diagnose problems with PCP wells
- Use *LOWIS* software to:
 - Configure a PCP well for data capture from an automation system
 - Monitor well performance
 - Analyze PCP well performance using real time measurements
 - Validate a well test based on results of analysis

Course Contents

- Automation basics: terminology, devices used, field sensing devices
- Basic components of a PCP well
- Inflow and outflow performance as applicable to PCP wells
- *LOWIS* software introduction
- PCP well surveillance
- PCP performance analysis
- Well testing methodology and test data interpretation for PCP wells

Additional Information

This 3½ days long course is not an open course. It is presented on-site at client locations using live data on existing *LOWIS* systems and may be tailored to suit client needs. For more information on this course or to schedule a session at your facility, please contact a Weatherford representative.

ReO User Training

The course is designed for participants who have at least a basic knowledge of production simulation methods and who require to gain expertise in the operation of *ReO* software. All the key aspects of the software are covered in this course. The course is designed to take five days.

Course Description

Each participant will have access to a computer for use during the course so that the maximum time possible is spent on working through the example data sets. This ensures that all participants have good exposure to the software and will be fully conversant with it on completion of the course. Attendees will receive a course manual for future reference (the manual is also accessible from the online help menu of the software).



Course Contents

- *ReO* software overview (Module 1)
 - Key features
 - How the software works
- Constructing and running a *ReO* model (Modules 2 and 3)
 - Files and administration
 - Links and pipes
 - Network objects
 - Objectives and constraints
 - Optimization
 - Bulk data entry and editing tools
- Detailed compressors in *ReO* software (Module 4)
 - Gas turbine and gearbox connectivity
 - Turbine performance
 - Compressor performance
 - Detailed compressor constraints
- Gas lifted wells in *ReO* software (Module 5)
 - Gas lifted well objects
 - Gas lifted wellhead performance data
 - Compositional issues
 - Gas lift optimization
 - Flowgroups
- WellFlo software (Module 6)
 - Well model tuning
 - Advanced gas valve modeling
 - Transfer of data to *ReO* software
- History matching a *ReO* model (Module 7)

Course Overview

Rod Pump Optimization

Our rod pumping optimization training is not a product based training class. Instead these classes focus on learning and enhancing engineers' skills in production optimization by introducing new and reviewing time-proven methods for optimizing production. The classes we offer with a description and the estimated length of the sessions are listed below.

Well Optimization

Students learn a variety of time-proven methods for optimizing oil well production. The instructors have decades of field experience in production optimization. The well optimization class can be customized to your particular needs.

Estimated class time: Custom

Applied Rod Pumping Class

Structured for students who need a basic foundation in rod pumping, the class also touches on concepts that are addressed in the self-paced modules, but it is focused on the person who wants to gain a sound understanding of rod pumping artificial lift. In the applied rod pumping class, students also learn a variety of time-proven methods for optimizing production of rod pumped wells. Using these well analysis methods in a field provides the operator with the following benefits:

- More efficient well and field analysis
- Increased production
- Increased mean time between failures
- Reduced utility costs
- More efficient use of technology

Estimated class time: Three days

Rod Pumping Optimization Class

Instructors use their 25-plus years of experience in oil field production to create a high-level class that is beneficial to advanced users with experience in rod pump optimization and an understanding of the rod pumping software. They bring a unique combination of experience and expertise to the classes that are taught in an open, interactive format providing students with advanced methods for analyzing well performance. This class covers in depth the methods discussed in the self-paced modules.

Estimated class time: Three days

Self-Paced Training Modules

Weatherford has instituted a system aimed at users who want to hone their skills by working on details of recognition, correction, and optimization of production problems. The training classes are offered at your site or at Weatherford's office in Houston. These modules allow you to work at your own pace and schedule to gain advanced training for optimizing production and decreasing expenses. You can choose one or several modules to attend and then try some of the methods discussed in the field. Later on, when you are ready, you can schedule other modules. Because these classes are moderately priced, attending them will not take a big chunk out of your budget.

- Use of rod pumping software for proactive recognition of optimization opportunities
- Electrical cost reduction through the optimization of system efficiency
 - Counterbalance
 - Pumping unit size
 - Prime mover size
 - Runtime
 - Rod design
- Card interpretation surface and downhole cards
- Why use pump off control? Justification benefits
- RPC idle time methodology
 - RPC based
 - Trial and error
 - Fluid level based
- Calibration
 - RPC load and position
 - Strain gauges vs. load cells for load
 - Real position vs. proximity switches
 - How to recognize calibration problems
 - Calibration methodology
 - Calibration methods for calculated fluid level/PIP from the rod pumping software
- Use of rod pumping software

Estimated class time: Half day for each module

Sendra Software Training

This course is designed primarily for people who use Sendra software for solving special core analysis problems. Laboratory personnel involved with SCAL measurement and interpretation will find this course especially useful by learning how their experiment results are interpreted, and how laboratory routines are improved using Sendra.

Course Description

This course provides you with the knowledge and hands-on practice that you will need to learn how to use Sendra and to become comfortable with its most important features. The main feature of Sendra is based on determining relative permeabilities and capillary pressure that reconciles the experimental data by simulation. Using your own computer, you can work independently on a problem or in groups of two attendees.

The course is directed towards the interpretation of core analysis data that is used to determine accurate relative permeability and capillary pressure functions for use by field applications. Relative permeability provides important input parameters to reservoir simulators as well as **MatBal**[™], *WellFlo* and *PanSystem* software.

Upon completion of this course, you should be able to:

- Determine relative permeabilities and/or capillary pressure
- Simulate and QA experiments for a given set of laboratory data
- Reconcile experimental data by matching history
- Use parameters to represent flow functions

Course Contents

The following summarizes the main subjects to be covered during the course:

- Simulation of core flood experiments
- Estimation of flow functions
- Assessment of accuracy
- Design of experiments

Additional Information

Attendees need to install Sendra on their own laptop computer or other training computers at the customer's site. This must be done prior to the training.

We will provide training material with a number of exercises. However, we prefer that attendees have available their own SCAL experiments that can be analyzed during the training.

The customer should ensure that each attendee has a printed version of the user guide prior to the training.

Course Overview

Well Test Analysis

This course covers the basic theory and practice of well testing. It is intended for engineers, geologists, and other technical staff who are, or may become, involved in the design, supervision, or interpretation of well tests. The course is valuable for those with no previous experience in well testing and also as a refresher for those whose experience does not include modern analysis techniques.

Course Description

The course covers the basic elements of well test analysis methodology and the theory on which it is based. The major parameters derived from well tests are introduced for the principal classes of reservoir the student will encounter. The course contains many practical, hand worked examples to develop skill and confidence in performing simple routine analyses. The course has also been designed to reflect the universal acceptance of computer-aided interpretation methods and participants will analyze field examples using state-of-the-art PC-based software.

Course Contents

- Introduction (reservoir performance, basic concepts, need for testing)
- Steady state, semi-steady state and transient well performance
- Drawdown testing
- Buildup testing
- Semilog analysis
- Diagnostics and derivative analysis
- Wellbore storage and type curve matching
- Linear discontinuities (sealing faults, stratigraphic pinchouts)
- Late time boundary and depletion effects
- Vertically fractured wells
- Naturally fractured reservoirs
- Variable rate analysis methods
- Gas well testing
- Skin factor analysis and well deliverability
- Reservoir limit testing
- Well test operations
- Test design

“The instructor has a good ability to make complicated things easier to understand.”

Conoco

“The course guided us beautifully through the logic of well test interpretation. Complicated stuff was dealt with very simply.”

Enron Oil & Gas

Well Test Analysis in Complex Reservoirs

The course is intended for engineers who already have grounding in the basics of well test analysis. The course will tackle well testing situations which are rarely covered in textbooks and are commonly found in fields around the world.

Course Description

Emphasis will be placed on recognition of the behavior of typical models through use of the pressure derivative. Lectures and practical work will be allocated equal time on the course. A wide range of field examples will be tackled in the practical sessions which will be conducted using Weatherford's well test analysis, *PanSystem*, software. This format, which has been very successful in previous courses, enables participants to work with many field examples and thus gain a deeper understanding of the subject in a short time. Participants are encouraged to bring samples of data from their own well tests for use in the practical sessions.

Course Contents

- Review of conventional methods—derivative analysis
- Effect of sealing and partially communicating faults
- Dual permeability model
- Vertical interference testing
- High permeability lens intersecting a well
- Limited entry effects
- Dual porosity reservoirs—effective wellbore connection
- Layered systems—use of production logging measurements
- Pressure response in linear reservoirs—channel sands, fault blocks, etc.
- Material balance analysis of pressure depletion in complex reservoirs
- Compartmentalized systems
- Numerical well testing and integration with geology

“Good organization in every aspect, from the basic models to the more complex systems giving an easy-to-follow course.”

LASMO

“I learned a great deal and it will certainly help me in my well testing future.”

Crestar Energy Inc.

Course Overview

Well Test Analysis Workshop

1st Day

- Basic well test analysis procedures
- Diagnostic plots and applications
- Types of tests
- Input data review prior to analyze a well

2nd Day

- Derivative as the main analysis tool
- Flow regimes definition and concepts
- Type curve use and applications
- Linear regression simulators
- Non-linear regression simulators

3rd Day

- Non-ideal wellbore storage models
- Revision of main analysis reservoir models
- Late time effects review

4th Day

- Numerical simulation principles
- Revision of main input parameters
- Link to analytical models
- Basic analysis procedure using a numerical simulator

5th Day

- Pinch-out models
- Multi-layer situations
- Horizontal model
- Finite length boundaries
- Boundaries review

NOTE: This course is designed to work with data provided by the participants; Weatherford needs to have the data at least two weeks in advance to prepare the course material. It is also available in two or three-day modules. The latest version of *PanSystem/PanMesh* software will be used. It is necessary for all participants to be familiar with *PanSystem* software.

Well Test Data Validation

1st Day

- Revision of well testing practices
- Types of operations using pressure gauges
- Types of gauges
- Definition of terms
- Revision of actual gauge's technology
- Main pressure gauge's characteristics

2nd Day

- Comparison of gauges
- Manufacturer's features
- Data validation concept
- Data validation tools
- Data validation techniques
- Memory vs. SRO
- Differences
- Advantages and disadvantages
- Gauge specification effect on pressure response
- New *PanSystem* features for data validation

3rd Day

- Use of derivative as a quality control tool
- Smoothing: myth and reality
- Use of temperature signal for quality control
- Workshop with prepared examples using the latest version of *PanSystem* software

NOTE: It is not necessary to be an expert using *PanSystem* software for this course, but a basic knowledge of well testing principles and concepts is required. The last day is dedicated to work with real life examples and attendees are encouraged to bring their own data.

WellFlo User Training

This course provides you with the knowledge and hands-on practice that you will need to use *WellFlo* software as an engineering tool for oil and gas production optimization applications. Using *WellFlo* software simulations that are based on nodal analysis that are performed under steady-state multiphase flow conditions, you will learn the skills that will enable you to solve design problems and to perform various analysis tasks.

Course Description

The course provides practical training in the use of *WellFlo* software. It focuses on design and analysis of naturally flowing oil and gas wells, as well as gas lift and electric submersible pumping systems that are based on systems analysis (also known as nodal analysis) concepts, not on the underlying engineering concepts. It is therefore important that attendees have at least a basic knowledge of nodal analysis techniques and production optimization using artificial lift methods. The main topics will be covered with a brief refresher on the underlying principles.

The course is designed for engineers who intend to use *WellFlo* software to analyze, troubleshoot, design, and optimize well production. Attendees will become familiar with *WellFlo* software by using the software on a series of hands-on worked examples, covering data preparation, PVT tuning, selection of multiphase flow correlations, pressure and temperature profile matching, basic analysis, and a set of natural flow, gas lift, and ESP well analysis models.

Upon completion of this course, you will be able to:

- Design, construct, and analyze natural flowing gas lift and ESP well models
- Identify or predict conditions in which a well will stop producing
- Perform production optimization via system analysis on each component
- Identify under-performing wells
- Conduct sensitivity analysis on various components of a well system to ensure a robust design
- Evaluate liquid loading in gas wells
- Identify bottlenecks in production system
- Select tubing, flowline, and choke sizing
- Enable wells that do not produce naturally
- Determine potential depth of a gas injection valve
- Select a pump for maximum production, best pump efficiency, or optimum well flow conditions
- Generate VLP curves over a range of flowrates
- Determine ESP suction and discharge conditions over a range of frequency (Hz)
- Troubleshoot an underperforming well
- Increase production as a result of overall production system analysis

Course Contents

The following summarizes the main subjects to be covered during the course:

- Data preparation and validation
- Nodal analysis concept and software
- Building a well model
- PVT correlations and data tuning
- Flow correlations
- Inflow and outflow performance relationship
- Oil and gas well analysis
- Liquid loading in gas wells
- Erosional velocity
- Basic gas lift design methods
- Basic ESP design and analysis
- Sensitivity analysis on natural flow, gas lift, and ESP wells
- Production optimization and forecasting

Additional Information

Attendees need to bring their own laptop computer with local administrator's privileges to install *WellFlo* software.

Course Overview

Wireline Formation Testing and Production Log Data

This course has been developed for geologists, reservoir engineers, and other petroleum technologists who are interested in the application of logging and distributed pressure measurements to enhance their understanding of the relationship between the geological model and the actual reservoir behavior.

Course Description

Beginning with an introduction to the geological model of reservoir structures the course then demonstrates how formation tests and production log measurements can be used to improve understanding of the reservoir behavior, particularly in the case of layered and compartmentalized reservoirs. Field examples are used to illustrate how this integrated approach leads to improved reservoir description essential to the efficient management of the reservoir.

Course Contents

- Distributed pressure measurements
- Wireline formation testing
- Pressure profiles in unproduced and producing reservoirs, observed pressure gradient intersections
- Effect of filtrate invasion on measured pressure, supercharging
- Capillary pressure effects, permeability from test pressure response
- Differential depletion, barrier transmissibility
- Effective vertical permeability
- Field examples
- Distributed flow measurements
- Production logging devices, measurements and calibration
- PL profiles—field examples, two-phase flow, deviated wellbore
- Identification of fluid entries, thief zones, plugged perforations
- Inflow performance of multi-layer systems
- Use of flow meter in well testing
- Identification of reservoir structure
- Integration of distributed pressure and flow measurements
- Material balance for a complex reservoir
- History matching of a reservoir model
- Prediction of long term pressure response, parameter estimation

Wireline Formation and Reservoir Testing

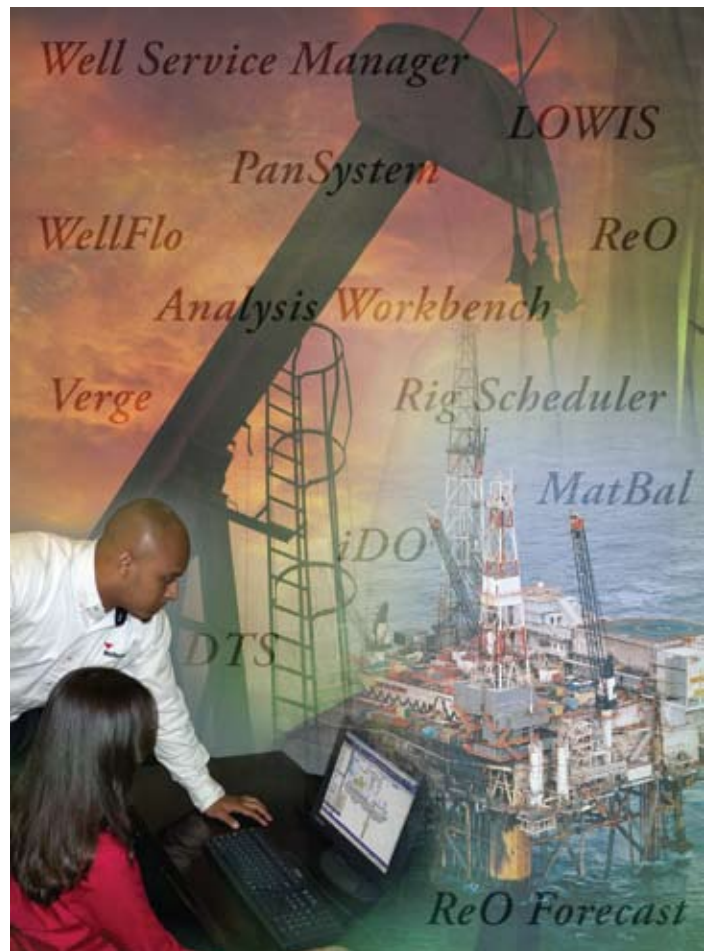
This course has been developed for geologists, reservoir engineers, and other petroleum technologists who are interested in the application of logging and distributed pressure measurements to enhance their understanding of the relationship between the geological model and the actual reservoir behavior.

Course Description

The course examines the application of wireline formation tester (WFT) distributed pressure data in appraisal (unproduced field) and development (produced field) wells. In addition the determination of permeability, horizontal and vertical, using new generation, pump-out tools is addressed fully. Finally an extensive coverage of the sampling aspects of the new generation tools is given. Software packages for analyzing data will be used in conjunction with field examples.

Course Contents

- Distributed pressure measurement (DPM)
- Exploration applications of DPM
- Field development applications of DPM
- Permeability from WFT and NGWFT
- Sampling
- Capillary pressure effect
- Integration with production logging
- Review of selected SPE and SPWLA key papers
- Demonstration of pressure-depth plotting software
- Demonstration of pressure transient analysis software for NGWFT (*PanSystem* software)





Contact Information

Authorized By: _____
 Job Title: _____
 Company: _____
 Telephone: _____
 Fax: _____
 Email: _____
 Co. registration #: _____

Billing Address

Address Line 1: _____
 Address Line 2: _____
 City: _____
 State/Province: _____
 Postal Code: _____
 Country: _____

Course Information

Course: _____
 Location: _____
 Dates: _____

of attendees: _____
 Cost per person*: \$ _____
 Total cost*: \$ _____

*Plus VAT where applicable

Please Register the Following Delegate for the Course Indicated

Trainee: _____
 Job Title: _____
 Company: _____
 Telephone: _____
 Fax: _____
 Email: _____
 Diet Restrictions: _____

Address Line 1: _____
 Address Line 2: _____
 City: _____
 State/Province: _____
 Postal Code: _____
 Country: _____
 Nationality: _____

Check Payment Instructions (full fee payable in advance)

Thank you for your course registration. Please send a copy of this course registration form along with a check payable to Weatherford to:

c/o Weatherford Solutions Sdn Bhd
 Attention: Jennifer Gann
 12th Floor, West Wing
 Rohas Perkasa, No. 8 Jalan Perak
 50450 Kuala Lumpur
 Malaysia
 Tel: 60-3-2168-6000
 Fax: 60-3-2168-8676

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Thank you for your course registration. Please send a copy of this course registration form along with a check payable to Weatherford to:

Weatherford
 Attention: Rosie Venzor
 15995 North Barkers Landing
 Suite 275
 Houston, TX 77079
 Tel: 1-832-201-4200
 Fax: 1-832-201-4300

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Thank you for your course registration. Please send a copy of this course registration form along with a check payable to Edinburgh Petroleum Services to:

EPS Ltd
 Attention: Andy Brown
 Research Park
 Riccarton, Edinburgh, EH14 4AP
 United Kingdom
 Tel: +44 (0) 131 449 4536
 Fax: +44 (0) 131 449 5123

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Thank you for your course registration. Please send a copy of this course registration form along with a check payable to Weatherford to:

Weatherford Oil Tool ME – CAC Inc.
 Attention: Smitha Alexander
 Villa No. 2, Sector W 15/02, Plot No. 27, Airport Road
 Opposite Mussalah Al Eid Ground
 PO Box 41829
 Abu Dhabi
 United Arab Emirates
 Tel: +971-2-4189555
 Fax: +971-2-4460570

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Asia/Pacific Region

c/o Weatherford Solutions Sdn Bhd
Attention: Jennifer Gann
12th Floor, West Wing
Rohas Perkasa, No. 8 Jalan Perak
50450 Kuala Lumpur
Malaysia

Tel: 60-3-2168-6000
Fax: 60-3-2168-8676

Canada, United States, and Latin America Region

Weatherford
Attention: Rosie Venzor
15995 North Barkers Landing
Suite 275
Houston, TX 77079

Tel: 1-832-201-4200
Fax: 1-832-201-4300

Europe/Africa Region

EPS Ltd.
Attention: Andy Brown
Research Park
Riccarton, Edinburgh, EH14 4AP
United Kingdom

Tel: +44 (0) 131 449 4536
Fax: +44 (0) 131 449 5123

Middle East/North Africa Region

Weatherford Oil Tool ME – CAC Inc.
Attention: Smitha Alexander
Villa No. 2, Sector W 15/02, Plot No. 27, Airport Rd
Opposite Mussalah Al Eid Ground
P.O. Box 41829
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