

Well Completion & Workover

Improving operations through a strategic approach on the key elements of well completion and workover

Date: 08th October 2012 – 12th October 2012

Location: Kuala Lumpur, Malaysia



Petrosync Distinguished Instructor

Michael Etuhoko, P.Eng., PMP
President & Founder, Protekz Inc Canada

Case Studies,
Discussions,
&
Practical Exercises!

- Over 22 years of engineering, operations, and management experience in Completion, Workover & Well Services, and Drilling
- Highly sought after Consultant, President & Founder of Protekz Inc Canada, an independent well and production engineering consultancy
- Leads major completion and workover projects with companies such as Shell Canada, KNOC, KPO etc in North America, Europe, Africa, Central Asia, & Far East Asia
- Authored and presented SPE Papers at the SPE Asia Pacific Oil & Gas Conference (Australia, 2004) & SPE Annual Technical Conference & Exhibition (Texas USA, 2004)

Testimonials

"Mike is highly professional, rigorous in analysis, and bold in exploring new ideas and technologies. He has a wide knowledge of the different aspects of well completion. I believe his highly varied experience would be appreciated by his audience."

-- Reservoir Engineering Manager, Total E & P

"Mike demonstrated a very strong technical ability in planning, designing and supervising operations. I personally learnt a lot from him and I will gladly recommend him to anyone in the oil and gas industry for his services."

- Well Completion Engineer, JVGAS (Statoil-BP-Sonatrach Joint Venture), Hassi Messaoud

"Mike is well respected within the Well Operations department among his peers and those he mentors. He has an excellent track record for adding value to the daily operations as well as update and review of technology that is used on our operations."

-- Senior Panning & Performance Engineer, Karachaganak Petroleum Operating (KPO)

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Masterclass Overview

Well completion is considered to be one of the most critical parts in the preparation for oil production. During the completion process, engineers identify the best strategy in designing a well in order to optimize oil retrieval later on. This presents a challenge because different reservoirs have various physical and chemical factors that should be taken into consideration when running the best type of well completion.

Later in the life of the well, it undergoes changes in its operations, affecting its production efficiency. When a well reaches this point where it is not performing at its optimal, well workovers and interventions are performed to remedy the situation. It is a challenge to address any well inefficiency with the best workover strategy at the least amount of time and cost.

This course addresses the above needs of engineers in both well completion and workover. It will focus on building the current foundation of engineers on completion and workover techniques, but will further provide practical exercises and industrial applications on the key decisions needed to be made during the completion and workover processes. Moreover, an in-depth discussion on the emerging technologies and methodologies on well completion and workover would be covered. This includes the techniques such as Smart Well Completion, Multi-lateral Well Completion, HPHT Completions, Sub-sea Completions, and Fiber Optics Completions. The discussion shall go in-depth on the features, benefits, and costs for each type of technique. This course will address how to tackle the common well environments and also the extreme well problems engineers may face during completion and workover processes. At the end of the training, a field project design exercise will be given to culminate all lessons presented throughout the course.

Masterclass Objectives

- ▶ IDENTIFY & UNDERSTAND the parameters that influence selection and design of completion components
- ▶ INTEGRATE the importance of completion process to future production run
- ▶ DELIVER techniques to selecting best tubing size and best material for completion
- ▶ GAIN practical methods in designing, planning, and executing safe and efficient well completion
- ▶ MANAGE well environments with extreme chemical, temperature, and pressure characteristics
- ▶ BRIDGE the importance of well design in relation to the ability to carry out well interventions
- ▶ EXPLORE new technological developments in well completions and workovers
- ▶ PLAN an appropriate intervention and workover strategy to maintain or increase field production

Specially Designed for

The course is designed for, but not limited to Completion Engineers, Workover Engineers, Production Engineers, and those who are involved with well completions, workovers, well interventions, and production.

- ▶ Completion Engineer
- ▶ Workover Engineer
- ▶ Well Services / Intervention Engineer
- ▶ Production Engineer
- ▶ Drilling Engineer
- ▶ Well Site Engineer

Petrosync Quality

Limited Attendees

The course has limited seats to ensure maximum learning and experience for all delegates.

Certificate of Attendance

You will receive a Certificate of Attendance bearing the signatures of the Trainer upon successful completion of the course. This certificate is proof of your continuing professional development.

Interactive Training

You will be attending training designed to share both the latest knowledge and practical experience through interactive sessions. This will provide you with a deeper and more long-term understanding of your current issues.

High Quality Course Materials

Printed course manual will provide you with working materials throughout the course and will be an invaluable source of reference for you and your colleagues afterward. You can follow course progress on your laptop with soft copies provided.

WELL COMPLETION AND WORKOVER

08th - 12th October 2012

DAY 1

Course Introduction & Overview

Introduction to Completion Design

- Field Life Cycle
- Completion Design Overview
- Completion Design Data Requirements
- Designing an Efficient and Safe Well
- Understanding the Completion Design Process
- Team Integration During the Design Process
- Types of Completions

Exercise: Introduction to Field Development

Reservoir Completion

- Introduction to Inflow Performance (PI, Skin, etc)
- Cased and Perforated Completion
- Introduction to Fracturing
- Open-Hole Completions
- Sand Control Completions
- Impact on Future Interventions

Exercise: Reservoir Completion

Importance of Design & Installation Process To Completion Running & Well Interventions

DAY 2

Improving Completion Performance

Tubing Performance

- Basics of PVT (Pressure, Volume, & Temperature)
- Multi-Phase Flow
- Tube Sizing
- Interface with Reservoir Completion
- Lazy Wells

Enhancing Production through Artificial Lift Methods

- Gas Lift
- ESP
- Jet Pumps
- Sucker Rod Pumps

Course Exercise: Completion Performance

Production Chemistry: Handling Challenging Reservoir Environments

- Introduction to Reservoir Fluids
- Identification of Common Production Problems
- Reduction Methods to Common Production Problems
 - Scales, Wax, Asphaltenes, Hydrates, Reservoir Souring, H₂S

Course Exercise: Problem Identification

DAY 2

Handling Different Well Environments (Discussion & Case Studies)

- Deep wells
- Light Oil/Condensate Gas
- High GOR
- H₂S > 5%
- CO₂ > 5%
- Low Porosity
- Low Permeability
- HPHT Reservoir Environment

DAY 3

Tubing Stress Analysis

- Purpose of Stress Analysis
- Stress Loads
 - Stress and Strain
 - Axial Loads
 - Burst/Collapse
 - Tri-Axial Analysis
- Safety Factors and Design Factors
- Load Cases
- Completion Equipment and Connections

Class Exercise: Tubing Stress Calculations

Material Selection

- Metals
- Metallurgy & Corrosion
- Elastomers & Plastics
- Protective Coatings

Completion Components

- Completion Philosophy
- Completion Components
 - Christmas Tree, Tubing Hangers, Tubing Downhole Safety Valve, Packers, Tail Pipes, Expansion Devices, Nipples, Mandrels, Gauges, Etc
- Interface with Reservoir Completion

Group Work: Well Completion Design

Completion Operation Base Preparation

- Equipment Purchasing and Factory Acceptance
- Service Contract
- Equipment Preparation
- Technical Program



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If you like to know more about this excellent program, please contact Jerry Tay (Conference Director) on +65 6415 4502 or email jerry.t@petrosync.com

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DAY 3

Rig Preparation and Completion Installation Process

- Operation Planning
- Equipment Shipping
- Equipment Reception
- Pre-Job Meeting
- Casing Cleaning Operation
- Running Inhole the Completion Equipment
- Well Clean-Up
- Reporting
- After-Action Review

DAY 4

Emerging Completion Techniques

- Fiber Optics (Distributed Temperature System)
- Flow Control Valves (FCV)
- Formation Isolation Valve (FIV)
- Intelligent and Smart Completion
- Multi-Lateral Wells
- Underbalanced Completion

Introduction to Well intervention

Benefits of Well Intervention

Well Intervention Methods

- Workovers / Service Rigs
- Coiled Tubing
- Snubbing Unit
- Wireline (Slickline & E-Line)
- Intervention in Sub-sea Wells
 - Horizontal Tree
 - Conventional Tree
- Intervention in HP-HT Wells
- Hydrate Remediation

New Intervention Techniques

- Lightweight Intervention System
- Intelligent Well Intervention

DAY 5

Well Control

- Well Control Equipment
 - Blowout Preventer System Requirements
 - Choke Manifold
 - Circulating System
- Kicks and Its Causes
- Well Killing Operation
 - Forward Circulation
 - Reverse Circulation
 - Bullheading
 - Lubricate and Bleed

Class Exercises: Well Control

Workover Operations

- Workover Definition and Description
- Workover Types
 - Safety Workover (SWO)
 - Long Term Suspension (LTS)
 - Plug and Abandonment (P&A)
 - Production Enhancement (PE)
- Fishing Operations

Case Study: Workovers

Integrating Completion and Workover Operations

Industry Best Practices and Worst Practices

- Lessons and Common Mistakes During Well Completion and Workover Operations

Feasibility Studies (incl. Workover Economics)

Operations Cost Management

Handling Service Providers

- Service Management Role
- Contingency Plans

Conclusion & Course Wrap-up

PROGRAM SCHEDULE

08:00 – 09:00	Registration (Day1)	13:00 – 14:00	Lunch
09:00 – 11:00	Session I	14:00 – 15:30	Session III
11:00 – 11:15	Refreshment & Networking Session I	15:30 – 15:45	Refreshment & Networking Session II
11:15 – 13:00	Session II	15:45 – 17:00	Session IV
			End of Day



WHY YOU SHOULD ATTEND PETROSYNC'S EVENTS

- To ensure that all objectives of the course matches yours, all PetroSync programs are developed after intensive and extensive research within the industry
- PetroSync programs focus on your immediate working issues to ensure that you are able to apply and deliver immediate results in real work situations
- Application and implementation of industry knowledge and experience are the drivers for our course design, not theoretical academic lectures
- PetroSync training focuses on practical interactive learning tools and techniques including case studies, group discussions, scenarios, simulations, practical exercises and knowledge assessments during the course. Invest a small amount of your time to prepare before attending the course to ensure maximum learning
- PetroSync follows a rigorous selection process to ensure that all expert trainers have first-hand, up-to-date and practical knowledge and are leaders of their respective industrial discipline

Petrosync Distinguished Instructor



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Michael Eтуhoko, P.Eng., PMP
President & Founder, Protekz Inc Canada

Michael (Mike) Eтуhoko is a well known consultant and founder of Protekz Inc. Canada, an independent well and production engineering consultancy company. He has over 22 years of experience in the Oil & Gas industry. He has led major projects & trainings for major companies in Europe, North America, Africa, Central Asia, and Far East Asia. Mike currently consults worldwide in the area of Well Completion, Workover and Well Services, Sand Control, and Formation Damage Prevention and Treatments. Before working as a consultant, he has served several years in Shell and Total E&P, which has equipped him with a solid foundation in well completion and workover practices.

His Current and Recent Assignments Include the Following:

- ▶ **Lead Completions & Intervention for Karachaganak Field, Kazakhstan**
Completion & Intervention for Field with Characteristics: Deep wells (\pm 6200m TVD on the average), light oil/condensate and gas, High GOR, H₂S > 7%, CO₂ > 6%, low porosity, low permeability and HPHT reservoir environment
- ▶ **Subsea Intervention/Workover/Completion for Korean National Oil Company**
Diagnose and restore Donghae 1-4P Sub-sea well back to production
- ▶ **Completions, Sand Control, & Well Testing (Deepwater Exploration Asset) for BG Nigeria**
Responsible for "Well Completion and Testing" operations in deepwater exploration campaign
- ▶ **Well Productivity for Total E&P**
Scales Squeeze treatment for Dunbar, Alwyn, Otter and Elgin/Franklin fields; Fracturing design and operations in HPHT wells; Sand Control in HPHT wells, Water shut-off in HPHT wells

Mike has presented for several international conferences including Offshore Technology Conference, SPE Asia Pacific Oil & Gas Conference, and SPE Annual Technical Conference Exhibition. He has also authored SPE papers on "Monobore Completion Using Interventionless Technology" and "Open Hole Multistage Fracturing Completion in Carbonate Reservoir."

In the recent years, Mike has provided intensive trainings in well completion and workovers with different oil and gas companies. Some of these training are "Well Completion & Intervention Training (Level 1&2)" for KPO, "Sub-Sea Workover Operations Training" for KNOC, and "Deep Water Sand Control" for Total E&P International.

Client List

Mike Eтуhoko has worked with the following companies as consultant and trainer, and has been deployed worldwide for various major completion and workover projects:

- ▶ Shell
- ▶ Total E&P International
- ▶ Chevron
- ▶ BG Nigeria
- ▶ Karachaganak Petroleum Operation (KPO) (Kazakhstan)
- ▶ Korean National Oil Company
- ▶ ENI-AGIP
- ▶ Luke Oil (Indiana, US)
- ▶ JVGas (Algeria)
- ▶ & Many Others

