PETRO1
TECHNICAL CONSULTANCY FOR OIL & GAS INDUSTRY

# Production Technology for other disciplines

## Provide an overview of the fundamentals operations in production and processing of Oil & Gas

**25th – 29th May 2015 Kuala Lumpur, Malaysia**



"Excellent deliverability of concept. Objective fully met, Thanks"
**Hess Exploration & Production Malaysia BV – Team Lead subsurface**

"Excellent trainer and materials. Very conclusive environment"
**Petronas Carigali – Team Lead Production Optimization**

"Good"
**Petronas Carigali – Project Engineer**

"Obtain a great learning session with Prof.Bahman. Such a great trainer. Excellent"
**Petrofac Malaysia – Petroleum engineer**

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# Program Overview

As oil & gas production continues to move into deep water and more remote frontiers, moving reserve from harsh environment remains a true challenge. Every stage of production: from the point at which hydrocarbons flow into the well, right through the production facilities, to the final point of sale remains vital in contributing to the hungry energy demand.

This 5 day course is intended for professionals with a non-production engineering experience or junior production engineers, who currently work in/with or wish to work in/with the production engineering or simply wish to learn more about this major operation.

The course will start with defining the role of a production engineer, basics of flow in porous media and wellbore (inflow performance relationship and tubing Performance relationship), nodal analysis, flow through chokes and continues with downhole design concepts and components, completion practices, perforations, workover. The course will cover various stimulation techniques and artificial lift options. Other important aspects such as formation damage, sand control, flow assurance, corrosion, wireline services, well problems, advanced/intelligent wells, will be discussed. Finally an in-depth discussion of oil & gas discussion of oil & gas processing and onshore/offshore development will be given. The course will conclude with environmental aspects of petroleum industry.

Participant coming from non-production engineering background and new employees will learn about various elements of production engineering and how they work. This will enable them to have more efficient conversation with various service providers, gain trusts/respect from their colleagues, advise them better and more effectively, understand relevant abbreviation and terminologies. The training starts from basic concepts and aim to give good in-depth understanding without being too academic.

## Attend this course to Master:

- Understand all main aspect and learn a well-balance knowledge of production engineering.
- Better appreciate the connection among various aspects of production Engineering.
- Better visualize the different elements of production system, how they work, evaluate risks and be able to advice the industry more effectively.
- The relevant abbreviations and terminologies.
- Create more opportunities and execute more efficiently.
- Recognize the challenges faced by the industry related to production engineering.
- Develop the vocabulary and understanding of roles necessary to facilitate discussions with other professionals on production engineering topics.
- Gain valuable insights on the production engineering with recent developments that impact the industry process.

## Technical Contents:

| | |
|---|---|
| Introduction | Learn about the role of production engineers and their wide range of activities and responsibilities and interactions with other disciplines (e.g., reservoir engineers, drilling engineers, service companies, etc.). |
| Governing equations - IPR, TPR, Nodal Analysis, Flow Through Chokes | Learn about important factors controlling flow in porous media (i.e., from reservoir to the wellbore) and inside the wellbore (i.e., from bottom of the well to the surface). How to plot inflow performance relationship (IPR) and tubing performance relationship (TPR). Finally, what is the role of choke and how to calculate flow through chokes. (Exercises: calculating IPR and TPR.) |
| Downhole and Surface Completion Concepts and Components | Discuss downhole completion concepts, various options for bottomhole completions (e.g., open hole, cased hole, gravel pack, expandable screen), choosing flow conduits and surface completion. Gain in-depth knowledge of various components and their roles (e.g., packer, sliding side door, tubing, side pocket mandrel, etc.). (Exercises: calculating forces on a packer.) |
| Wireline Services | Gain in-depth knowledge on slick line and wireline services, different components and their applications, operational challenges, Production Logging Tools (PLT) running and interpretation. (Exercises: PLT log interpretation.) |
| Processing | Learn about oil & gas processing (separating water, oil & gas), dehydration, water treatment, offshore developments, environmental impact of oil and gas operations. (Exercises: Sizing a separator.) |
| Stimulation and Artificial Lift | Understand various options for well stimulation (e.g., hydraulic fracturing, acidization), artificial lift (AL), deciding when a well requires AL, design and optimization of AL. (Exercises: Designing AL and optimizing gas lift.) |
| Other Topics | Flow Assurance, sand control, workover, coiled tubing, multi-lateral wells, horizontal wells, intelligent/smart wells, e-fields, perforations, formation damage, well test, etc. (Exercises: Evaluating flow assurance risks, designing peforation job.) |

## Class exercises

To ensure the concepts are properly understood and animations are presented to illustrate the fundamental operation production. For Example: (Downhole tools.)

- Several examples on estimating recovery factor under various natural drive mechanism.
- Calculating forces on a packer
- Examples on log interpretation in production logging tool
- Gas lift optimization and many more.

## This program is intended

This intermediate course is designed for:

- production,
- geoscientists,
- geologist,
- reservoir engineers,
- drilling engineers,
- process engineers
- Operation engineers
- New engineers / graduate engineers
- Other technical personnel involved with exploration and drilling —including managers and supervisors requiring contact in production engineering space or non-production engineers interested in learning more about production engineering.

### Introduction

- Origin of petroleum
- Sources of reservoir energy
- Primary, secondary and tertiary recovery
- Production system
- Energy loses in the system
- Role of Production Engineer
- Exercise: estimating Recovery Factor

### Performance of Wells

- Introduction to flow in porous media
- Inflow Performance Relationship (IPR)
- Flow in wellbore
- Tubing Performance Relationship
- Flow through chokes
- Nodal analysis
- Exercises: calculating IPR and TPR

### Downhole and surface Completion

- Bottomhole completion
- Gravel pack
- Expandable screen
- Options for flow conduit
- Basic completion string facilities and their roles
- Wellhead and Xmas tree
- Subsurface safety valve
- Side pocket mandrel
- Sliding side door
- Other essential and non-essential components
- Land or offshore completions
- Exercise: calculating forces on a packer

### Wireline/ slick line Services

- Surface equipment for wireline services
- Wireline tool string
- Wireline operating tools
- Production Logging Tools (PLT)
- Exercise: PLT log interpretation

### Perforating

- Introduction to perforation
- Shaped charge characteristics and performance
- Evaluation of charge performance
- Various options for gun systems
- Operational consideration
- Health and safety
- Underbalance/overbalance perforations
- Recent advances in perforation
- Exercise: designing perforation job

### Well Intervention and Workover

- Requirement for workover
- Technical and economical evaluation

### Well Problems

- Reservoir associated problems
- Wellbore associated problems
- Modification and re-design
- Lift considerations
- Abandonment

# Production technology for other disciplines (5 DAYS)

### Smart/Intelligent Wells

- History
- Components
- Advantage and disadvantages
- Case studies

### Artificial Lift

- Options available for artificial lift
- Selection of artificial lift
- Electrical submersible pumps
- Gas lift and its design and optimization
- Exercise: designing ESP and gas lift

### Formation Damage

- Causes of formation damage
- How to minimize formation damage
- Formation damage mitigation options
- Skin factor
- Well test
- Exercise: calculating skin factor

### Acidizing

- Option for acidizing
- Designing an acid job
- Operational aspects
- Evaluation
- Problems associated with acid job

### Hydraulic Fracturing

- Advantages and disadvantages
- Available options
- Design and implementation
- Fracturing in unconventional reservoirs

### Sand Problems

- Evaluating sand problem
- Sand control
- Living with sand

### Oil Processing

- Oil, gas and water separation
- Multi-stage separation
- Various separator options
- Exercise: separator design, evaluating flow assurance problems

### Gas Processing

- Gas dehydration
- Gas sweeting
- Exercise: Evaluating hydrate problem

### Water Handling and Treatment

- Oil in water
- Chemicals

### Environmental Aspects of Petroleum Industry

- Hydrocarbon discharge to the environment
- $CO_2$ emissions
- Chemicals

# Principal Program Facilitator

## Bahman Tohidi Ph.D, Hydrafact Limited UK

- 30 years of experience and research interest in PVT phase behaviour and properties of reservoir fluids and CO2-rich system, gas hydrates and flow assurance.
- Director of centre for gas hydrates research (C-FAR) at institute of petroleum engineering, Heriot-Watt University.
- Published more than 200 papers and holds 9 patents mainly in gas hydrates and PVT.
- SPE distinguished lecturer with his talk entitled, "Gas hydrates: Friend or Foes?".
- Extensive hands on experience as production engineering with major oil companies.
- Managed more than 300 relevant projects for various oil & gas companies: Total, BP, Statoil. Shell, Talisman, Chevron, INPEX, Tullow oil, Petronas, Petrobras, Dolphin Energy, Saudi Aramco, BG Group, DNO, Schlumberger, Dana, DONG Energy, Halliburton, Cameron and others.

### Bahman Tohidi Ph.D. - PROFESSOR, HERIOT-WATT UNIVERSITY, MANAGING DIRECTOR, HYDRAFACT LIMITED

Oil & gas knowledge-based, spin-out company from Heriot-Watt University. It offers a comprehensive range of technical and scientific services in the fields of hydrates, flow assurance, PVT, phase behaviour and properties of reservoir fluids and $CO_2$-rich systems

- Consultancy - offering a wide range of consultancy services both experimental and/or modelling.
- Software - HydraFLASH® is a state-of-the-art Hydrate and PVT software package. It has been ranked the best in two independent evaluations and is currently used by several major operators.
- New Technology - Commercialisation of IP - Hydrafact commercialises relevant IP(mostly developed at Heriot-Watt University). The latest example is HydraCHEK®, a device to monitor hydrate inhibition and safety margins by downstream measurement of hydrate inhibitor concentrations. More recently Hydrafact has developed a technology for removing Kinetic Hydrate Inhibitors (KHI) from produced water.
- Manufacture/supply of laboratory testing equipment - temperatures ranging from -90 °C to +350 °C and pressure up to 3,000 bars
- Managed more than 300 relevant projects for various oil & gas companies: Total, BO, Statoil. Shell, Talisman, Chevron, INPEX, Tullow oil, Petronas, PEtrobras, Dolphin Energy, Saudi Aramco, BG Group, DNO, schlumberger, Dana, DONG Energy, Halliburton, Cameron and others.

Director of Centre for Gas Hydrate Research and the Centre for Flow Assurance Research (C-FAR) at Institute of Petroleum Engineering, Heriot-Watt University with several projects on various aspects of gas hydrates and flow assurance, and phase behaviour and properties of reservoir fluids and $CO_2$-rich systems

- Leads Hydrate and Phase Equilibria Research Group at Institute of Petroleum Engineering, Heriot-Watt University.
- Research interests include PVT phase behaviour and properties of reservoir fluids and $CO_2$-rich systems, gas hydrates, flow assurance, and reducing the emission of greenhouse gases.

His teaching activities included Petroleum Engineering and Production Technology, as well as offering several short courses to the industry (including; Flow Assurance and Gas Hydrates, PVT and Phase Behaviour of Reservoir Fluids, and Petroleum Engineering for other Disciplines). He has published more than 200 papers and holds 9 patents mainly in gas hydrates and PVT. He was SPE Distinguished Lecturer in 2004-2005 with his talk entitled, "Gas Hydrates: Friend or Foes?". Bahman is a Professor at the Institute of Petroleum Engineering, Heriot-Watt University and a visiting Professor at Qatar University. Bahman is a member of the Society of Petroleum Engineers and a member of the EPSRC (the UK Engineering and Physical Science Research Council) Peer Review College for 2006-2009 and 2010-2013 and former member of editorial board of Journal of Chemical Engineering Research and Design (2009-12).

Instructor, AIT and Production Engineer (National Iranian Oil Company) NIOC (1984-1991)

After graduation (BSc in Chemical Engineering from Abadan Institute of Technology, Iran), he joined National Iranian Oil Company (NIOC) in 1984 where he worked as Production Engineer as well as University Lecturer for seven years. Bahman Tohidi joined Heriot-Watt University in 1991 and graduated with a PhD in Petroleum Engineering in 1995 with his doctoral work on the phase behaviour of water-hydrocarbon systems and gas hydrates. He started his employment at Heriot-Watt University in January 1994 working in both Hydrate and Reservoir Fluids research projects.

PETRO1 TECHNICAL CONSULTANCY FOR OIL & GAS INDUSTRY

PETRO1 provides Oil & Gas Trainings & Consultancy services ranging from Petroleum Engineering, Exploration & Production, Subsurface and business related activities in the oil & gas industry. We had successfully made impact to petroleum professional mainly the Top 50 Oil & gas players in the Asia Pacific Region.

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- Clough
- Mubadala Petroleum
- Bureau Veritas
- Pertamina
- Peritus international
- Petrofac
- Keppel Corporation
- Singapore refining Company
- Salamander Energy
- Binh Son Refining Vietnam
- PTT Global
- Newfield
- Atkins Australasia
- Brunei Methanol
- Curtin univeristy
- Technip
- Premier Oil
- SGS
- PTT EP
- Halliburton
- Brunei LNG
- Shell Chemical
- Worley Parson
- China university of petroleum Beijing
- Thaioil
- Aker Solutions
- Star Petroleum
- Jurong Shipyard

# Investment Packages

| Production Technology for other disciplines | Early Bird Full 5 Days | Standard Price Full 5 Days |
|---|---|---|
| Per Delegate | SGD 5795 ( ) | SGD 5995 ( ) |

Team Discount of 3 or more off 7%

- Team discount are not applicable to early bird pricing.
- For 5 or more, please do contact us to get attractive price.
- Early Bird Promotion Deadline – 7st April 2015

Please Note that a SGD$40 will be incur for Administration Fee.

# Delegate Details

1. Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

2.Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

3.Name:_____Mr☐Mrs☐Ms☐Dr☐

Job Title: _____

Email : _____

Contact No: _____

Department:_____

Head of Department:_____

# Invoice Details

Invoice Attention to:_____

Company:_____

Industry:_____

Address:_____

Postcode:_____ Country:_____

Telephone:_____ Fax:_____

Email:_____

Authorized Signature : _____

# REGISTRATION FORM

## PROGRAM DETAILS

Venue: Kuala Lumpur, Malaysia
Date: 18th – 22th May 2015

REGISTER NOW
CONTACT: kelvin
MAIN: +603 7727 3952
FAX: +603 7722 5278
Email: registration@petro1.com.my

## Payment by Credit card

Please Debit my credit card:

☐ VISA ☐ MASTERCARD

Card Number: _____ - _____ - _____ - _____

Security Code: ☐☐☐ Expiry Date: ☐☐☐☐

Named printed on card:_____

Signature:_____

**Payment Method**
By cheque/ Bank Draft: Made Payable to PETRO1 SDN BHD
By Direct Transfer: Please quote invoice numbers on remittance advice.

ACCOUNT NAME : PETRO1 SDN BHD
BANK : HSBC Amanah Malaysia Berhad
ACCOUNT NO : 054 – 048061 – 701 (SGD)
SWIFT CODE : HMABMYKL

**All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.**
*** Credit card payment will include a charges 2.8%**

**Payment Policy:** Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Payment is required with registration and must be received prior to the event to guarantee the seat. Payment has to be received 7 working days prior to the event date to confirm registration.

**Venue:** All of our training courses are held in 4 – 5 star venues.
The course fee does not include accommodation or travel cost. It's recommended to book the hotel room early as there are only limited room available at the discounted corporate rate.

**DATA PROTECTION**
The information you provide will be safeguarded by Petro1 that may be used to keep you informed of relevant products and services. We take it seriously when it come s to protection of our client data.

**Cancellation & Substitutions:** Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Should you be unable to attend, substitutes are always welcome at no additional cost. Please inform us as early as possible. Payment is non-refundable if cancellation occurs 7 working days prior to event commencement. However a substitute is welcome at no additional charges. If cancellation occurs 5 working days prior to the registration date and there is no substitute, the organizer reserves the right to charge 50% of the total investment from your organization.

PETRO1 SDN BHD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. PETRO1 SDN BHD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, war, fire, labor strike, extreme weather or other emergency.

**Walk in Registration:** Walk-in participants with payment will only be admitted on the basis of seat availability at the event and with immediate full payment.

**Program Change policy**: The organizer reserves the right to make any amendments and/or changes to the workshop, venue, facilitator replacements and/or modules if warranted by circumstances beyond its control.