

Mastering Advanced Flow Assurance & Gas Hydrate Management

Exploring ways to control flow and optimizing your production potential.

23-25 November, 2010 Parkroyal Kuala Lumpur, Malaysia

28-30 November, 2010 Manama, Bahrain.

This masterclass will be highly interactive and include:

- Real-life case studies discussion
- Interactive exercises to help participants to work through real-life scenarios
- Demonstration of the latest tools and their applications using computer simulations

Can you recognize the consequence of not fully interpreting and implementing the design in your operations?



Ratnam Sathanathan is the Global Flow Assurance Manager at Subsea 7 in Aberdeen, Scotland. He has **MORE than 3 DECADES of experience** in the Oil & Gas Industry. His interests lie in thermal and hydraulic management of multiphase transportation systems, the development of long distance, deepwater subsea tieback solutions including Subsea Processing and the economic development of marginal fields. Ratnam has extensive field experience in process system design and operation and he has designed onshore and offshore facilities, with many successful major subsea developments to his credit. His clients include many of the multinational oil operators and contractors across the globe like **Shell, BP, Chevron, ExxonMobil, Statoil, Petronas, Petrobras, Lundin, Texaco, Elf, Total, Cenrica, BHP, DONG and many others.**

This dynamic course will capture the following topics

1. Multiphase transportation from reservoir to processing facilities.
2. Prevention of solid (wax) deposition / gas hydrate management
3. Thermal / chemical management of whole subsea production system
4. Subsea system integrity management, Flow assurance link, corrosion / erosion & sand transportation in multiphase flow.
5. Transient operation (dynamic behaviour), start-up, operation, shut down(cool down), slugging analysis (slug suppression/catcher)
6. Deep & ultra deep water development including sub sea processing

Who should attend?

Engineers, Managers, Supervisors, Superintendents, Specialists and Technicians responsible for:

- Chemistry
- Deepwater
- Flow assurance
- Facilities
- Field
- Exploration
- Offshore
- Operation
- Pipeline
- Production
- Process
- Petroleum
- Reservoir
- Research and development
- Subsea
- Surface/ Subsurface
- Technical
- Well



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Course Overview

Flow Assurance problems encountered in the oil and gas production have become more onerous, leading to an increased overall awareness in the industry. This is particular in the offshore sector, where low temperatures, remote locations and often great water depths of subsea environments conspire to exacerbate problems such as erosion/corrosion, blockages through hydrate formation or wax deposition or topsides' facilities shutdowns due to severe slugging. Moreover, the ramifications of these issues can be serious incurring significant intervention costs and substantial losses in production revenues. Flow assurance has, therefore, been recognised by many operators as a critical technical activity, vital to the success in all the phases of planning, project execution, operation and production surveillance. This workshop provides innovative techniques & technologies, skills, approaches & practical strategies to address the challenges such as slugging, hydrates, corrosion / erosion / scale, solid deposition etc. in the flow assurance management and identify solutions to secure the production operations, minimizing the down times, and reducing the production costs.

The Case Studies to be delivered at the course will cover

- Oil & Gas field development- Normal & Deepwater.
 - Single well / Multi-well field development
 - Hydraulic analysis to establish the flowline size to deliver the production forecast through the life of field
 - Thermal analysis to establish the required thermal barrier to deliver the fluid to the host facility above the critical temperature (WAT & hydrate formation temperature) throughout field life
- The above two and performed together using multiphase simulators (software).

Management of Field Operation

- Normal operation / start-up (ramp-up) / shut-down (ramp-down)
- Dynamic fluid behaviour in the flowline & riser system

Thermal management

- Passive management
- Insulation materials Wet / Dry & for deep & ultra deep water
- Active management
- Hot fluid circulation heating systems / electrical heating

Corporate In-house Training Programme

If you have more than 8 delegates attending an in-house course, the savings to your organization can be huge since our corporate in-house courses are charged by the day, not per delegate, therefore you pay one rate regardless of the number of people you wish to train (subject to a maximum class size).

For more information please contact Ms. Pavithra Vinoth

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Sponsorship and Exhibition opportunities

Consistently attracting decision-making attendees from across the industry, this project will provide an excellent platform for you to build new business relationships. Through tailored networking, sponsors can achieve face-to-face contact that overcrowded trade shows can't deliver. Sponsorship options are extensive and packages can be tailor made to suit your individual needs.

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Workshop Day 1

Registration 815am- 830am

Section 1: 8:30am to 10:30am

- Overview-Oil & Gas production normal / deep & ultra deep water
- Flow assurance principles and essentials
 - ✦ Principles of:
 - ✓ Fluid flow : single, two and multiphase transportation
- Topic coverage in : onshore / offshore / normal, deep and ultra-deep water development
 - ✦ Fluid composition: PVT relationship , properties
 - ✦ Physical properties and its influences
 - ✦ Density of oil & gas
 - ✦ Viscosity of oil & water, emulsion impact
 - ✦ Modelling options for simulations (blackoil and composition model)

10:30am- 10:45am Morning refreshment

Section 2: 10:45am to 12:30pm

- Thermal management strategy : Temperature dependent transportation
 - ✦ Passive thermal management
 - ✓ Insulation materials WET / DRY environments.
 - ✦ Active thermal management
 - ✓ Hot fluid circulation systems
 - ✓ Electrical heating systems
 - ✦ Cold spot management

1230pm- 130pm Luncheon

Section 3: 1:30pm to 3:30pm

- Thermal and Hydraulic performance assessment
 - ✦ Subsea field development , HUB concept
 - ✦ Long distance tie-back to host facilities for processing.
 - ✦ HP / HT field developments

3:30pm- 3:45pm Afternoon refreshment

Section 4: 3:45pm to 5:00pm

- Multiphase flow behaviour and Operability assessments
 - ✦ Slugging mechanisms.
 - ✓ Designing for slug management
 - ♥ Slug suppression systems
 - ♥ Slug catcher at reception facilities

Workshop Day 2

Registration 815am- 830am

Section 5: 8:30am to 10:30am

- Transient Operations
 - ✦ Operability assessments
 - ✦ System turndown
 - ✦ Planned and unplanned shutdown
 - ✦ System shutdown and fluid cooldown
 - ✦ System re-start & warm up to avoid hydrate formation.

10:30am- 10:45am Morning refreshment

Section 6: 10:45am to 12:30pm

- Pipeline Integrity Management & environmental impact
 - ✦ Corrosion management
 - ♥ Covering Flow Assurance aspect
 - ♥ Inspection / monitoring
 - ✦ Erosion management
 - ♥ Erosion limitations
 - ♥ Erosion rate determination
 - ♥ Sand / particle transportation in multiphase flow

1230pm- 130pm Luncheon

Section 7: 1:30pm to 3:30pm

- Solid Deposition assessment
 - ✦ Hydrates & Wax
 - ♥ Hydrate Prevention & Remediation strategy
 - ♥ Hydrate management
 - Thermal and Chemical
 - ♥ Wax Management
 - Thermal and Chemical
 - ♥ Chemical Injection to improve field operability

3:30pm- 3:45pm Afternoon refreshment

Section 8: 3:45pm to 5:00pm

- Management of field operation
 - ✦ Normal operation / Start-up (ramp-up) / shut-down (ramp down)
 - ✦ Dynamic fluid behaviour in the flowline and riser system
- Subsea Technology to enhance production
 - ✦ Gas lift / ESP / HSP

Workshop Day 3

Registration 815am- 830am

Section 9: 8:30am to 10:30am

- Subsea Processing
 - ✦ Booster technology
 - ✦ Subsea multiphase metering
 - ✦ Subsea separation

■ Cold Flow

- ✦ Temperature INDEPENDENT transportation

10:30am- 10:45am Morning refreshment

Section 10: 10:45am to 4:00pm

- Exercises & case studies discussion
- Software simulation (multiphase flow)

12:30pm- 1:30pm Luncheon

3:30pm- 3:45pm

Afternoon refreshment

4:00pm

Summary and End

of Conference



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