



PetroleumETC is pleased to bring the offshore industry an intense and highly focused DeepDive into Tiebacks with Seafloor Pumping. We are uniquely positioned to offer this technical training. The PetroleumETC **Multiphase Pump User Roundtable (MPUR)**, now in its 19<sup>th</sup> year of operation, is the premier industry event on multiphase pumping with a distinguished Advisory Board comprised of deepwater end-users such as BP, Chevron, ExxonMobil Shell, Statoil and leading subsea suppliers. For this course PetroleumETC has teamed up with the leading seafloor suppliers to provide an extensive overview of seafloor pumping as specifically applied in tieback offshore developments. These vendors will relay their product offerings directly related to tieback applications and cost reduction, in detailed sessions facilitated by our industry leading instructors.

## Critical Need for Training

Reduced commodity prices have dramatically transformed development strategies for deepwater fields. Over the past two years' project teams have seen many options to improve project economics eliminated. The focus on value has pushed tieback and seafloor boosting to the forefront as the most effective means to achieve and sustain economic flow rates from new discoveries. Seafloor boosting as an enabling technology for many tieback developments, whether greenfield or brownfield. New methods are emerging to dramatically cut the cost and complexity of seafloor boosting and there is an urgent need for project teams to be aware of what is available today to improve project economics.

## Learning Objectives

The course will provide a comprehensive overview of seafloor pumping technologies and highlight landmark installations as presented over the 19 years of the MPUR. Key issues around tieback developments, such as flow assurance/slugging, specialized subsea hardware and intervention will be identified. The course will provide deep insights into the technologies needed for low-cost seafloor pumping including emerging topsideless options. The goal of the course is to raise awareness of seafloor boosting as an important element of the modern subsea development toolkit.

## Intended Audience

Project engineers evaluating tieback options for offshore and deepwater applications is the primary target audience. This includes disciplines such as SURF, Production Engineering, Rotating Equipment, Elec Engineering and Topsides Facilities Engineers. Due to the strategic nature of the material presented, this course will also be of interest to Development/Operations Managers, Team Leaders and members of integrated development/venture teams including Reservoir and Process Engineers.

## In-House Arrangements

This 1-day course is best suited for 15-25 professionals and will utilize the host company's classroom and video conference facilities to tie-in staff in a satellite office. For a fixed cost, PetroleumETC will provide instructors, course materials and facilitation as well as coordinate participation by the pump vendors.



# DEEPDIVE

## Tiebacks With Seafloor Pumping

### Course Outline

#### **Morning Sessions**

- Multiphase Flow/Pumping - grounding session on multiphase flow/slugging and contrasting currently available seafloor pumping technologies. Impact of pumping on well performance and EUR. (Scott)
- Topsidless Options - overview of current and emerging options including ESP's, canned motors, subsea speed control and alternative barrier fluids (Scott)
- Subsea System Decision Considerations - a systemic view of characteristics identification and attribute processing to build creative alternatives (Still)

- Development Parameters - seabed landscape, facilities alternatives and life cycle factors to optimize upon a solution selection; will cover geography, architecture and operations & surveillance (Still)
- Case Histories and Examples (Scott & Still)

#### **Afternoon Facilitated Vendor Sessions**

- OneSubsea Subsea Integration Alliance
- EagleBurgmann - Mechanical Seals
- AkerSolution/BakerHughes SPA
- GE and/or FMC and/or others

#### **Wrap Up Panel**

- Discussion of key learnings with instructors and corporate sponsor panel

### Instructors



**Dr. Stuart L Scott** is a well-known technical authority in the areas of artificial lift, multiphase pumping, and production engineering/operations. From 2008-2016, he managed the Shell Deepwater Artificial Lift Technology Program and served as the Artificial Lift / Pumping Principal Technical Expert (PTE) for Shell globally. Before coming to Shell, Scott held the Bethancourt Professorship of Petroleum Engineering at Texas A&M University, was a faculty member at Louisiana State University (LSU) and worked for Phillips Petroleum Company in a variety of roles. He holds B.S. and

Ph.D. degrees in Petroleum Engineering and a M.S. degree in Computer Science all from The University of Tulsa. Scott is a Distinguished Member of the SPE and an ASME Fellow. He also holds the ASME Worthington Medal for "eminent achievement in the evolving field of multiphase pumping."



**Mr. Ian Still** – Ian Still has over 30 years of subsea systems engineering experience in the hydrocarbon development and production processing industry, working in many global shallow and deepwater basins in his career. As principal systems engineer with Shell International he held the office of Subsea Systems Technical Authority contributing and validating the portfolio of concept identification, definition and execute projects in Brazil, GoM, Nigeria, Malaysia and Australia. He was accountable for HPHT 400°F and 20ksi subsea hardware development, subsea processing

technology programs, and held authority over corporate technical standards for subsea equipment in addition to serving on API sub-committees. He holds an honors BSc in Engineering from Robert Gordon University, is a Chartered Mechanical Engineer and a member of the International Council of Systems Engineering.