Priming the Pipeline of Innovation

As the world’s largest oilfield services company, Schlumberger is continuously engaged in developing new capabilities designed to deliver increased value for customers while ensuring cost-effective, environmentally sensitive exploitation of oil and gas reserves. To meet the challenges of a cyclical, ultra-competitive industry where innovative technology is essential to success, the company invests $1 billion a year in Research & Engineering (R&E) and employs around 4500 scientists and engineers in more than 60 R&E centres, including five major UK laboratories.

Schlumberger’s innovation strategy also has a key outward-facing component, complementing in-house capabilities by pinpointing, supporting, harnessing, investing in and working with world-class expertise in academia, high-tech companies, spinouts and startups. Its longstanding links with UK universities including Southampton, Cambridge, Oxford, Edinburgh and Heriot-Watt have been vital to the company’s ability to access specialist skills in domains such as sensing technologies and Artificial Intelligence that are transforming the exploration and exploitation of oil and gas reserves.

Schlumberger has furthered its aims of accessing UK universities’ expertise and nurturing it for the future through its close relationship with EPSRC. The relationship’s two-way benefits are reflected, for instance, in the range of EPSRC Centres for Doctoral Training (CDTs) that Schlumberger helps to support through financial and in-kind contributions (e.g. the CDT in Autonomous Machines & Systems) and which provide a source of skilled recruits for the company. In addition, specific initiatives (see examples on p.2) ensure a reservoir of skills and a pipeline of innovation that will continue to benefit both the company and the UK.
Intelligence-led Operation

Autonomous and intelligent systems that ‘think’ and act for themselves are a transformative technology. In oil exploration and drilling, though, the uncertainty integral to the process of penetrating subsurfaces in very harsh environments has impeded development. To surmount such barriers, the Autonomous and Intelligent Systems Partnership (AISP) – a strategic collaboration between EPSRC, Schlumberger and five other partners from sectors including aerospace and defence - supported nine projects across 16 universities in pursuit of a clear vision: to create a sustainable world-leading robotics and autonomous systems industry in the UK. For Schlumberger, a key outcome was a roadmap for developing a planning/control system capable of accommodating uncertainty. Delivering a step change in capability, this system has evolved from initial research concept and is now under field test controlling a rig in an automated drilling operation – promising to improve consistency and profitability, as well as reducing risk to personnel working in hazardous environments.

Sensing Opportunities

Ensuring the safety and efficiency of oil and gas operations places big demands on the ability to monitor reservoirs and pipelines. Whether on land, beneath the sea or over tundra, accurate measurement of parameters such as temperature, pressure and vibration is essential to maintaining optimum flowrates and preventing leakages. For over 30 years, Schlumberger has worked closely with the University of Southampton to enhance remote sensing capabilities. Particular success has been secured in the development of fibre optic sensors – more resilient, reliable and versatile than conventional sensors – with funding from EPSRC and a range of other industry partners, leading to patented technology now being deployed (e.g. in North Africa) and to the establishment of successful spinout companies.

“As a company with a major presence and important customer base in the UK, it’s very much in Schlumberger’s interest for the UK to be efficient, successful and capable of reaping the economic and other rewards of research and innovation. Working with EPSRC is a vital element in the chain, enabling us to maximise our ability to contribute to, and benefit from, the ongoing evolution of science and engineering excellence at UK universities.”

Dr Simon Bittleston, Vice President of Research, Schlumberger

- The oil and gas industry makes a key contribution to the UK economy, accounting for around 0.8% of GDP (figure for Q2 2015)
- In the UK, total expenditure in oil and gas on the UK Continental Shelf was £21.7 billion in 2015
- EPSRC’s Business Engagement Forum (BEF) currently comprises 45 companies, including Schlumberger