Nanotechnology and the oil business
Balancing energy and climate change
Tracking helicopters outside radar coverage
Developments in oil and gas communications
Production

and visualise waves, slugs, droplets and bubbles.

It can also help you manage the flow to try to reduce hydrates, which can solidify out of the liquid and gas flowing through the pipe and block it.

Total and ConocoPhillips invested in the new technology because they were struggling to adequately model multiphase flow in these complex conditions with the technology available, says Chris Ruigrok, head of sales, multiphase flow solutions, with Kongsberg Oil and Gas Technologies. "It is difficult to accurately simulate multiphase flow in the risers with current tools."

The system calculates in more detail than the competitors, Mr Ruigrok claims. "The main aim is to predict liquid hold up more accurately," he says.

The project combines together detailed calculations of oil and gas flow based on the fundamental physical and chemical properties, with real experimental data from the SINTEF Multiphase Flow Laboratory, where there is a 12 inch diameter flowline setup with a 70 m vertical riser.

20 people have been working full time on developing it since 2002.

"Experimental data is very expensive but it's also very important," says Mr Ruigrok.

Kongsberg has established a new business unit called Multiphase Flow Solutions to industrialise the technology, and look for ways to combine it with other product offerings, for example its K-Spice software which can model oil and gas process plant and control systems.

Setting the software up is fairly simple - you type in the shape of the pipeline (in terms of x, y, z co-ordinates at different lengths along it), you type in the data about the pipe and its contents - diameter, pressure, fluid temperature at start, outer temperature, heat transfer co-efficient, description of the fluid and start contents - diameter, pressure, fluid temperature (i.e. S-Series). Importantly senior engineering expertise is freed-up to focus on customers' most pressing needs built-in, thereby reducing up-time.

Schlumberger engineers preparing the SenTURIAN electrohydraulic operating system for a deepwater completion operation

But if there is ever a need to disconnect the landing string (eg because of a storm), it can close all the subsea test tree valves and disconnect the landing string in under 15 seconds safely, following a pre-determined sequence of operations.

"Mark of Schlumberger

GE new SVXT S-Series subsea tree

GE Oil & Gas has developed a new subsea tree that has a streamlined pre-configured design and promises to be massively more efficient than conventional predecessor subsea trees.

Designed and manufactured in Aberdeen, the SVXT is destined for harsh shallow-waters (i.e. S-Series) up to 90m deep. GE expects it will find a market in the UK North Sea and Asia Pacific, among other places.

The new Tree on Mud-line (TOM) equipment merges horizontal and vertical tree technology, reducing weight by 20%, reducing height, and also delivering essential functionality in a pre-engineered, pre-configured 'modular' way. By assessing its entire customized shallow water tree portfolio designed and built over the last 30 months and incorporating the around 85% common denominator elements, GE is confident that the new SVXT unit will offer customers enormous benefits.

Firstly, GE says, by offering all customers pre-engineered quality solutions we will improve clarity during equipment specification. This in turn streamlines the supply chain with rigorously qualified and validated products, and also speeds on-time delivery, driving faster execution in pre and post order phases. Importantly senior engineering expertise is freed-up to focus on customers' most challenging customisation requirements and problems.

Having CapEx and OpEx in mind, makes off-the-shelf equipment attractive to both buyer and seller - the buyer gets the equipment at potentially lower cost with essential elements built-in, thereby reducing upgrade, repair and maintenance needs over the long-term, while the seller gets potentially more profit through efficiency gains.

But it only works if the buyer is prepared to accept that a predominantly standardised piece of equipment meets most of the needs, something which Manuel Terranova, senior VP, subsea product platform, GE Oil and Gas, calls the "standardisation battle".