

# What's Next for Subsea Robotics? Semi-automation Software



The subsea industry has been pioneering the use of robotics for intervention and repair for more than two decades now. We have seen the advent and evolution of remotely operated vehicles (ROVs) and their accompanying technologies, including sensors, navigation and station keeping. Yet despite these advances, the industry has hardly moved beyond analogue/manual control, according to Don Pickering.

When one thinks of 'robotics,' we envision automation – factory machines, building automobiles or redundant pick-and-pack tasks. With geometries and tasks known and well defined, factory equipment can be programmed with a high degree of accuracy and reliability. But the moment we ask robots to work on objects of variable shape or size, or in dynamic states such as subsea, the idea of automation ceases to exist. Instead, we ask

ROV pilots to rely on poor visibility video and low-resolution 3D data, and to manage an overwhelming number of variables, to complete complex and dangerous tasks by manual control.

The lack of experienced pilots only compounds the problem. The recent downturn in oil and gas has created a scarcity of skilled pilots and reinforces a need for technologies to deskill and level the playing fields. Many skilled pilots have taken early retirements or left the industry for other work. As the quality of piloting decreases, costly accidents and equipment breakage rise – further adding to decreased mission performance and reliability.

To compensate, a lot of additional and costly work is undertaken. Simulation scenarios are painstakingly created for each mission. Systems Integration Tests (SIT), mission preparation and contingency planning are rigorously mapped out. Yet despite this preparation, mistakes are made – and when mistakes are made, plans are waylaid and costs go up.

In the last decade, several technologies have emerged that allow software and computers to support the pilot in subsea operations like never before. Parallel processing can render high-resolution awareness without latency. Machine learning can be used to identify and track objects. Force feedback can use the information for enhanced control. Just as cruise control was the first step on the journey to self-driving cars, these new technologies are bringing increased automation, ease and accuracy to telerobotic and ROV control.

As long as we continue to rely on manual control, we've reached a threshold of what's possible with subsea robotics. Today's subsea tasks require more skill than hardware alone can provide. Software is the missing link that will allow humans and machines to work effectively together to accomplish complex, high-risk tasks with increasing levels of safety and efficiency. These technological advances are ushering in a new era in our industry.

*Don Pickering is the CEO of BluHaptics, a software company based in Seattle that is leveraging video game technology to transform the world of robotic control. Pickering's presentation, 'Using Telerobotics Software to Deliver On the Lean Promise in Subsea Operations,' during Ocean Business 2017 was scheduled at 12:30 p.m. in the John Swallow Room (054/06) on Tuesday 4 April 2017. BluHaptics is at booth A2 in the Central Exhibit Hall on the NOC grounds.*