

Fugro GRL Models Subsea NDT Tools

As part of a European Project to develop new underwater non-destructive testing (NDT) tools, Fugro GRL provided its DeepWorks software to simulate the deployment by ROV of a long range ultrasonic manipulator in the jacket structure of an offshore platform. The work was part of 'SubCTest', a EUR2m project, sponsored by the EC to develop ROV-deployable inspection systems.

TWI in Cambridge, UK, has developed a prototype Long Range Ultrasonic Tool (LRUT) designed to be deployed by ROV and clamp around vertical or horizontal jacket tubulars. Fugro GRL created a simulation of the deployment of the tool by ROV and a simulation of the tool's operation in attaching itself to the tubular. Carrying out a simulation of the tool's operation was useful in reducing risk and cost prior to the underwater trial, in providing an early learning opportunity for engineers, and to allow design changes to be made based on the simulation rather than waiting to discover problems in the trials phase. The simulation has provided important proof of concept for the application of the tool.

Using DeepWorks, Fugro GRL was able to model the articulated mechanism of the ultrasonic manipulator as well as its electro-hydraulic supply system from the ROV. The tool could be tilted up and down, rotated and clamped around vertical and horizontal tubulars. The LRUT model was quickly generated using CAD models supplied by TWI. DeepWorks' simple drag and drop user interface allowed the model to be rapidly configured and early simulations were possible within a day. Refactoring and modifications were easily carried out by engineers without the need to use simulation specialists.

"We now have an operational prototype which we have demonstrated with an ROV in limited sea trials. Because of the expense of full offshore trials the Fugro GRL simulation is very useful in showing how the unit moves around a platform, locks on to a leg, collects data and unlocks," said Graham Edwards, Consultant, NDT group at TWI. "We now plan to use the simulation to demonstrate the potential of our prototype tool to prospective investors, and it's not just long range ultrasonics there are other NDT methods we can apply."

"Sea trials are among the most expensive aspects of subsea product development, and here simulation can play an important part in keeping costs down by reducing the amount of live testing that is needed," said Dr Jason Tisdall, Managing Director of Fugro GRL. "Fugro GRL was happy to work with the TWI consortium, cooperation in which we both broadened our expertise."