Cranfield university reaches record breaking depths in deep sea welding

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(PhysOrg.com) -- Research at Cranfield University has led to new world record depths in deep sea subsea welding. The results will significantly impact the offshore pipeline industry across the oil and gas, and renewable energy sectors.

For depths up to 180msw divers may be used for subsea pipeline maintenance and repair, but below these depths, mechanical couplings and other remote welding techniques are necessary. This research, carried out over a period of over 10 years, has enabled new depths of up to 940msw (metres of seawater) to be reached, over 600msw deeper than previous records.

The research was funded initially by the Engineering and Physical Sciences Research Council (EPSRC), who installed the world's highest pressure dry hyperbaric welding chamber at the University in 1997, able to simulate up to 2,500msw water depths. In this first phase, the chamber was used for the detailed theoretical and practical research on welding techniques at high pressures, and in 2004, the results demonstrated that welding at these previously unreached deep sea depths was indeed possible.

Since 2004, following the success of this research, pre-qualification and qualification work has been performed by industry partner Statoil to determine the practicality's of achieving these depths in the field. This has culminated in the first successful deep sea trials conducted in Norway this year.

Neil Woodward of Isotek Oil and Gas Ltd, who has been working at Cranfield on behalf of Statoil on the qualification work, said “It is excellent that the field trials demonstrated the practicality of using hyperbaric MIG welding for deep water remote applications.”

The University is now conducting further detailed research, supported by the EPSRC funded Cranfield Innovative Manufacturing Research Centre in collaboration with the Nigerian Petroleum Technology Development Fund, focused on improving weld quality and process reliability.

Provided by Cranfield University