

DEEPWATER

FORTIES FIELD FLOWLINES ANODE RETROFIT: NORTH SEA

Deepwater retrofits cathodic protection for the in-field flowlines on the Apache Forties field in the North Sea

The entire project was completed in 60 hours using a team of saturation divers, and also marks the greatest depth yet at which RetroPods™ have been deployed on a platform. Assets to be protected by "Phase 1" consisted of in-field pipelines, linking the four original Forties platforms (Alpha, Bravo, Charlie, and Delta). The retrofit cathodic protection (CP) anode system consisted of 12 RetroPods™ (aluminum sacrificial anode 'pods', 7 RetroSleds™ (aluminum sacrificial anode sleds) and 38 RetroClamps™ for electrical attachment.

The Apache Forties Field is one of the oldest fields in the UK sector of the North Sea, seeing first production in 1975. There are 5 platforms making up the field, Forties Alpha, Bravo, Charlie, and Delta which were installed in the 1970s, and Echo, which was installed in the 1980s. The bracelet anodes on the in-field pipelines linking the four original Forties platforms were heavily depleted and required a cathodic-protection system retrofit in order to maintain adequate levels of protection for the duration of the field life-extension. Hockway were nominated by Apache to provide a solution, and it was determined that the most cost-effective retrofit would use the RetroSled™, RetroPod™ and RetroClamp™ products manufactured by Deepwater. A detailed design was performed to calculate the optimum number of sleds, correct sled spacing and suitable subsea locations for equipment installation that would minimize installation time. Installation was performed in October 2007 under the supervision of Hockway and Deepwater engineers using an ROV support vessel, and was successfully completed on time and on budget. Phase 2 of the project, which involves a complete retrofit impressed-current cathodic-protection system for each of the four (4) original structures using the RetroBuoy™ system, was installed in 2010.

More info at www.stoprust.com



PODS FOR PIPELINES

Twelve RetroPods™ were utilized as part of 'Phase 1' of the retrofit.



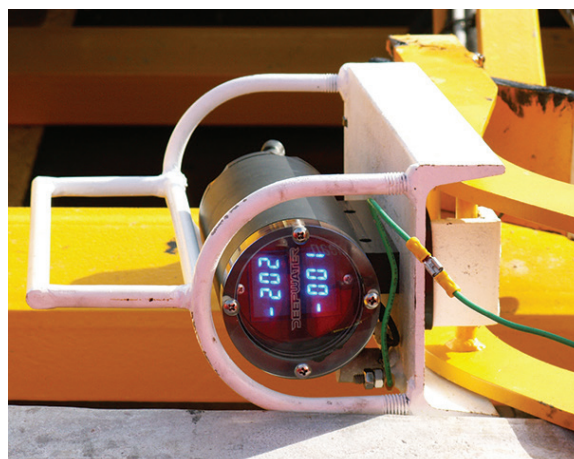
FLYING SLED

Seven RetroSleds™ were used as part of the new CP anode system.



ONSHORE ASSEMBLY

Assembly of the pods and sleds was completed in Aberdeen.



RETROREADER™ ON A RETROCLAMP™

The RetroReader™ gives visual confirmation of electrical contact