



SHELL LEMAN ALPHA REMOTE IMPRESSED-CURRENT RETROFIT IN THE NORTH SEA

Three RetroBuoys™ along with monitoring system installed on aging structures

Shell's Leman Alpha is a five-platform, bridge-connected complex located in the UK sector of the Southern North Sea. Three RetroBuoy™ Impressed-Current Cathodic Protection (ICCP) sleds were considered the most cost-effective solution for renewing the structures' CP, and their offshore deployment was completed in 17 days with each RetroBuoy installed in 12 hours each.

The Leman Alpha offshore asset located in the UK sector of the Southern North Sea was installed in 1967. It was determined that the original anodes on the AD1 jacket were nearing the end of their useful life, and the anodes on the other original jackets (AD2, AK and AP) would likely be consumed before the revised decommissioning date. It was determined that a remote ICCP anode system was the most viable bespoke option as it had the lowest total installed costs while protecting the entire complex rather than just a single platform. The project also included a new CP monitoring system to ensure the correct operation of the ICCP system.

After an in-depth analysis, it was concluded that the RetroBuoy™ would experience water flow and seabed movement higher than any previous location it has been installed. The solution was to dramatically increase the weight from the standard 3600 kg to 9200 kg, lower the centre of gravity to make it more stable on the seabed and add a secondary set of float tethers to reduce the movement of the anode modules. Another challenge was the seabed cable being affected by the sea currents and the rolling sandbanks. After reviewing different options including increasing the size and weight of the cable, it was determined that it would be necessary to cover the entire length of cable on the seabed with concrete mattresses to provide stability and cable protection. Additional mattresses were positioned around the RetroBuoy to prevent scour.

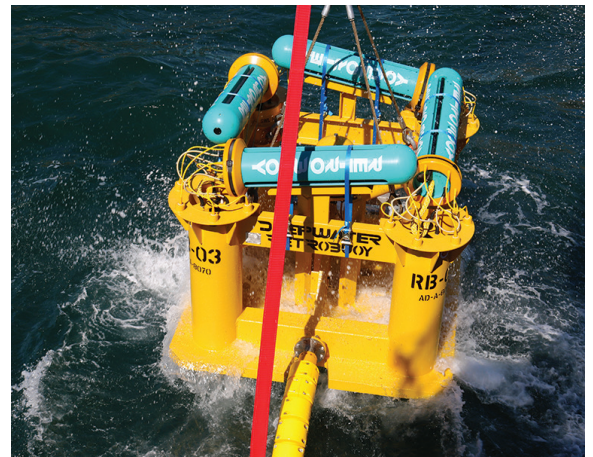
A total of 94 concrete mattresses were required for the project. The concrete mattress installation frame was able to "fast lift" these onto the installation vessel in batches of five to save time during the vessel load out. Two installation frames were provided so that while one was being used to install a mattress subsea, the second frame could be prepared for lifting the next mattress. This arrangement, in combination with the frame's quick release mechanism, allowed individual mattresses to be installed subsea in as quickly as 20 minutes.

The materials for the Leman Alpha ICCP retrofit project were engineered, delivered and installed within eight months of project approval with the entire project complete, including commissioning, within twelve months. After commissioning of the new ICCP system, the measured CP readings have shown that the RetroBuoys™ have shifted the CP potential of the Leman Alpha complex. The CP potentials have been affected across all of the platforms proving that the entire complex can be protected from corrosion by only the three RetroBuoys™ on the seabed.

More info at www.stoprust.com



OLD MEN IN THE SEA
The platforms have been in use for over half a century.



BULKED-UP BUOYS
Much heavier RetroBuoys™ were used because of the strong water currents.



A BOATLOAD OF MATTRESSES WERE NEEDED
Luckily, placing them took just 20 minutes each.