

DEEPWATER

ANASURIA TEAL RISER BASE CP MODELING: NORTH SEA

A life extension until 2037 was needed on the riser base.

The operator needed a life extension of 15 years on the Teal structure riser base in the Anasuria cluster, which was installed in 1996. It's located 175km east of Aberdeen in a water depth of 94m.

Deepwater EU Ltd was contracted to perform a cathodic protection (CP) evaluation using CP modelling and subsequent design work for the Teal structure riser base following a CP assessment performed for the Teal and Guillemot riser bases by DEU in February 2022. That report recommended a retrofit of both Guillemot and Teal riser bases using two RetroPod™ anode sleds; the Guillemot riser base was retrofit as recommended in May 2022. The historical and pre/post install CP survey of Guillemot was used as a check against the new CP design proposal.

The scope of work:

- Review existing asset information and CP survey data.
- Develop 3D CAD model of the riser base from existing drawings.
- Utilizing the 3D model and critical data identified, implement a CP FEA (cathodic protection finite element) model to determine existing levels of CP.
- Finite and boundary element analysis modeling to determine expected remaining lifetime of the original CP system and retrofit requirements.
- Design a retrofit CP system to ensure a 15 year life extension.

Given the possibility of unprotected steel on the riser base within the next year, a retrofit was recommended to be performed before the end of 2022. A prior DCSI report recommended the use of two RetroPod™ anode sleds. Modeling showed that installing one RetroPod™ was deemed insufficient to safely extend the life of the structure. Also, modeling showed that recessed areas on the asset were under-protected, requiring anodes to be placed on the structure.

Relocating the pods much closer to the asset yielded a meaningful improvement in retrofit performance to a marginally acceptable level but required work-class ROV operations in very tight quarters. An alternative strategy was then investigated, where a platform-sized anode would be landed on each of the two large pile-guide funnels and secured with integrated beam clamps similar in function to a RetroClamp™. Placing the two additional anodes directly on the structure appears to be less risky than moving the pods significantly closer and yields fully polarized results through the life-extension target.

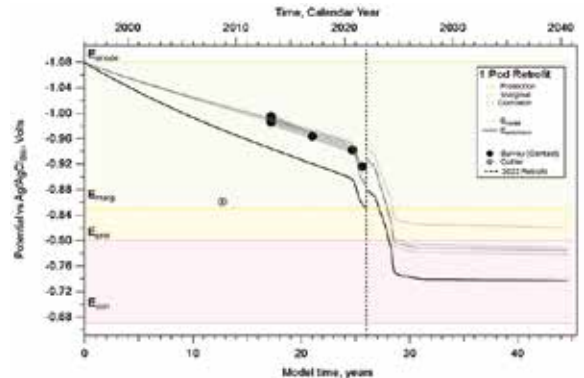
Recommendations-

Two RetroPods™ were recommended to be installed to extend the CP life.

Where possible, the RetroPods™ should be positioned as close to the riser base as operations can allow.

The addition of two pile-guide anodes to the two-pod retrofit should ensure full protection for the entire asset during the life extension.

More info at www.stoprust.com



MODELING SCENARIO ABOVE: SINGLE RETROPOD RETROFIT
The chart shows that a single RetroPod™ retrofit would not be adequate here.



AS-BUILT ANODE OUTPUT MODEL PROGRESSION (FROM NEW TO DEPLETED)
Top left shows anode output when new; lower right shows future anode depletion.