Corrosion Protection of Offshore Platforms

The use of high performance coatings to protect offshore structures is the common method to prevent excessive corrosion. Three coat paint systems (to ISO 12944, or NOHISOK M501 standards) can give a proven 15 years’ service life without major maintenance, however to reduce operating costs, platform operators are looking at new coating systems to extend this period, due to the high cost of carrying out any re-painting offshore. The cost of this maintenance painting on an offshore platform can be up to 100 times more expensive as land based maintenance, so when coatings fail it costs the owner enormous amounts of money due to loss of production.

The Oil & Gas Technology Centre (OGTC), in Aberdeen has been carrying out trials of a new anti-corrosion coating on two North Sea offshore platforms in collaboration with SPI Performance Coatings in the UK (the supplier). OGTC, which is jointly funded by the UK, Scottish, and Aberdeen governments, was established to develop a culture of innovation that will consolidate Aberdeen and North-East Scotland’s position as a global hub for oil and gas technology and innovation.

This novel spray applied inorganic coating (1) was applied initially on one N Sea platform which undergoing planned fabric maintenance. The coating was applied to areas of the platform’s lower deck that were suffering from severe corrosion. The existing three coat system which had required repair roughly every 3 to 5 years was completely removed from structural steel tubulars and flat plate. Initially, the surface was power washed and degreased to remove contaminants, and all tubulars were blasted to SA2.5, and flat plate mechanically prepared to ST3. While rust rashing was visible on areas prior to spray application of the anti-corrosion coating, this was deemed acceptable by the manufacturer due to its tolerance of damp substrates with this level of rust rashing/flash rusting. One coat of the anticorrosive coating was applied at 500 micron, and after curing an aesthetic topcoat was applied.

The novel coating is a 100% solids water based inorganic phosphate “ceramic” coating, which according to the manufacturer, reacts with the steel surface to form a 2 micron protective layer of iron magnesium phosphate, and a barrier ceramic-type layer which also acts as a phosphate “reservoir” to repair the protective layer when damaged, to give long-lasting corrosion protection. This trial is due to finish in December and the initial findings will be available at the beginning of 2019. In addition a further trial on another N Sea platform began in June 2018. Again, a single 500 micron coat of the novel coating plus an aesthetic topcoat were applied to pipework and some flat plate after surface preparation to SA2.5.

Reference

(1) EonCoat, Raleigh, North Carolina, USA.

AETOC 2019

The 11th International workshop on Application of electrochemical techniques to organic coatings, AETOC, will be held at Canet de Berenguer near Valencia, Spain, from 2nd-5th April 2019. This will be an opportunity to discuss the latest research topics and find industrial partners. More information can be found at, http://www.aetoc.uji.es/