International Oil&gas engineer

February 2019

www.engineerlive.com

for engineers – by engineers

Deepwater DEMANDS

Safer subsea operations

Gas gets FASTER

CORROSION CONTROL

Go with the flow
Expert advice on bringing digital tools to wellhead flow measurement

Smaller is safer
The detection technology that can stop a small, containable fire from spreading

COLLABORATE AGAINST CORROSION

An advanced anti-corrosion coating is being used successfully on two North Sea offshore platforms

EonCoat application complete

In a collaborative effort designed to improve vital protection of offshore assets, the Oil & Gas Technology Centre (OGTC) in Aberdeen, UK is successfully conducting trials of an advanced anti-corrosion coating on two North Sea offshore platforms.

The mission of the OGTC, which is jointly funded by the UK, Scottish and Aberdeen governments, is to establish 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.

The challenge, however, is that the UK's North Sea is one of the most brutal climates in the world. Often ice cold and windswept, the rigs in the North Sea face a constant corrosive onslaught of waves and salt spray.

Traditional coatings simply cannot withstand the environment. The cost of maintenance on a rig can be up to 100 times as expensive as land-based maintenance because crews and supplies often have to be helicoptered out to the site, so when coatings fail it costs the asset owner enormous amounts of money.

After extensive research, OGTC identified a spray-applied inorganic coating called EonCoat, from the USA-based company of the same name, as a method of delivering long term protection for the offshore assets. The anti-corrosive coating represents a new category of tough, chemically bonded phosphate ceramics (CBPCs) that can stop corrosion, ease application and reduce offshore platform production downtime even in humid, storm or monsoon-susceptible conditions.

OGTC worked with EonCoat's UK distributor and applicator, SPi Performance Coatings, to implement two trial programmes. With OGTC's vision and sponsorship, SPi applied EonCoat to a Total E&P platform and a Nexen platform, each of which is located on the UK continental shelf in the North Sea. Total is a global integrated energy producer and provider, and a leading international oil and gas company, with operations in more than 130 countries. Meanwhile Nexen is an upstream oil and gas company responsibly developing energy resources in the UK North Sea, offshore West Africa, the USA and Western Canada.

TOTAL E&P TRIAL

SPi applicators, along with EonCoat material and equipment, were helicoptered to Total's Elgin 'A' Wellhead platform on December 17, 2017. The coating was applied to areas of the platform's lower deck that were suffering from severe corrosion, and a topcoat was added for aesthetics.

Surface preparation for the trial was carried out by Muehlhan, a global provider of surface protection and

industrial services with operations in shipping, oil and gas, renewables and industry/infrastructure segments.

In the trial area, the existing coating system was completely removed from structural steel tubulars and flat plate. The structure was power washed and degreased to remove contaminants. All tubulars were blasted to SA2.5, and flat plate mechanically prepped to ST3.

Although rust rashing was visible on areas prior to spray application of the anti-corrosion coating, this was deemed acceptable due to the coating's particular properties. It can be applied to a damp substrate with rust rashing/flash rusting, and high salt levels do not degrade the coating, which reduces surface preparation requirements.

The coating can cure in a single coat 15 minutes after application, depending on climatic conditions, which expedites completion, compared to traditional coatings, which require extensive drying time between coats.

In contrast to traditional coatings, which only form a physical barrier to corrosion until breached, EonCoat chemically bonds with bare substrate surfaces, providing an iron magnesium phosphate layer that prevents steel corrosion. This process provides a very thin layer (about 2 microns) of permanent protection. A second layer – a tough ceramic outer shell – provides further protection, and also acts as a reservoir to re-phosphate the steel if needed. This ensures the alloy layer remains intact, and allows it to "self heal" if it is ever breached by mechanical damage.

During this ongoing trial, testing has been done via cross cuts of about 6-8in in length down to the substrate to provide evidence of EonCoat's self-healing properties.

NEXEN TRIAL

After the early success of the Total E&P trial, a second offshore trial is now being conducted. SPi applicators, as well as EonCoat material and equipment, were helicoptered to Nexen's Buzzard platform on June 18, 2018.

After Stork, a Fluor company and global provider of integrated operations, maintenance, modification and asset integrity solutions, assisted with fabric maintenance and surface preparation, SPi applied the anti-corrosion coating to platform areas suffering from severe corrosion.

Although results from this second trial are still under consideration, they look extremely promising.

"As oil and gas E&P companies look to combat offshore asset corrosion, extend safe production and reduce the need for costly maintenance and downtime, we look forward to working with OGTC, Total, Nexen, Muehlhan, Stork and other platform owner/operators in the North Sea," concludes Merrick Alpert, president of EonCoat. ●

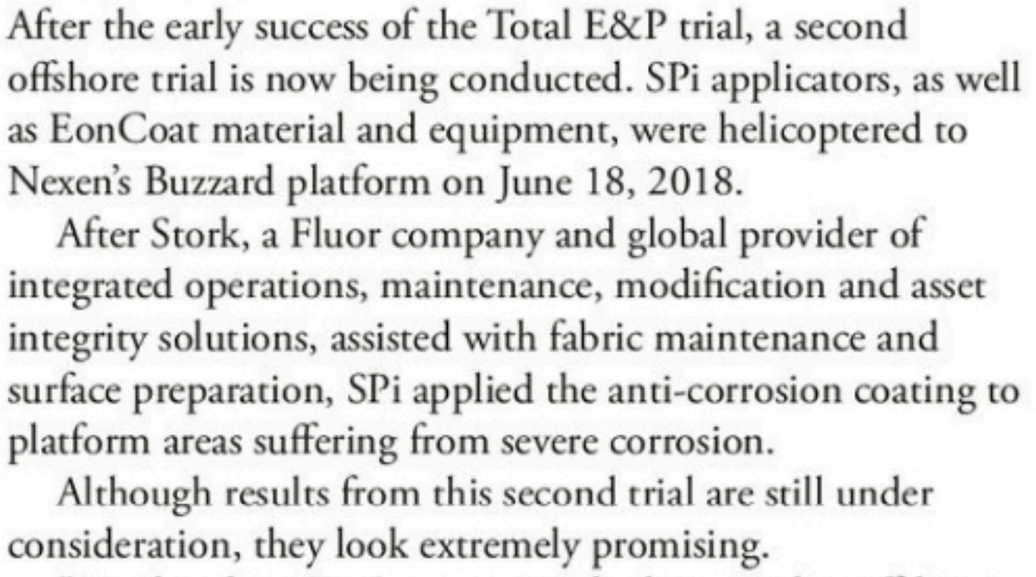

Image taken during coating application