

# How to Manage External Corrosion

Recent UK HSE reports have highlighted the need for dutyholders to monitor asset integrity in non-safety-critical as well as safety-critical applications, with effective maintenance management systems for components such as walkways and stairways, piping and pipe supports, cable trays and fittings, bolts, flanges and valves. Back in 2007 the KP3 Report asserted that there had been a failure to adequately monitor the status of asset integrity and pointed to the need for those with a duty of care to have a better understanding of the potential impact of degraded, non-safety-critical plant and utility systems on safety-critical elements.

Since 2007 many improvements have been made and there have been moves for a shift of focus from safety critical elements to include a greater concentration on overall asset integrity management - but much remains to be done. A 2009 OSD review concluded that major ongoing efforts were required, with ageing infrastructure presenting major challenges. It is with a view to addressing these challenges that some of the issues raised in the HSE 'Management of External Corrosion' document are examined in the light of what can be done using Enviropeel to provide prevention and remediation in the event of corrosion in offshore structures.

## AREAS OF CONCERN

The HSE 'Offshore external corrosion guide' lists six areas of concern: corrosion under insulation, firewater mains & deluge systems, flanges & plant bolting, valves, pipe supports & coatings and threaded plugs. A number of accelerating factors are highlighted, including the presence of water traps, mixed metals and saltwater conditions.

## HOW ENVIROPEEL CAN HELP

Most offshore installations regard a certain amount of rust as a necessary evil – conditions are such that a good deal of redundancy is built into systems, allowing for degradation from corrosion as part of the natural lifecycle of marine infrastructure. In many cases the need, for example, to cut bolts off because they are too corroded to unscrew, is regarded as standard procedure. Corrosion prevention is HSE's preferred option but, where levels of corrosion are allowed to develop, they insist on verifiable performance standards that define the limits beyond which components must be repaired or replaced.

The aim of HSE, of course, is to maintain safety standards. Naturally, the inspection and maintenance of offshore structures must be of the highest standard to ensure safety - but good maintenance is also necessary for optimum production levels over the lifetime of the structure.

Using Enviropeel to protect vulnerable offshore systems not only fulfills the HSE's preferred prevention option but it provides operators and dutyholders with a long-term solution to the need for constant inspection and maintenance of both safety-critical and non-safety critical elements. In most of



Above: a typical view of corroding flanges and valves on a North Sea platform.

Below: a typical flange, perfectly encapsulated with Enviropeel to preserve its integrity.



the areas of concern listed above, a corrosion-inhibiting encapsulation of the vulnerable components will prevent any degradation of the substrate, eliminating the need for bolt changes, equipment replacement or repair.

### INSPECTABLE

Although it is well established that bolted systems and components protected by Enviropeel remain corrosion-free for many years, it is essential that, when required, inspection of the substrate can be easily undertaken. Because Enviropeel is easily removed, all or any part of the protective layer can be easily peeled away to reveal the target area and, once inspected, the protection can be reinstated, either by complete reapplication or by resealing a specifically removed area. Enviropeel recommends an annual visual inspection regime with targeted removals and inspections as part of its 5 and 10-year warranty programmes.

### EFFECTIVE

You can be confident that Enviropeel will provide the protection you need because of the way it works. Corrosion requires a number of elements to develop. For aqueous corrosion this would normally be the metal substrate, oxygen and water. Enviropeel isolates the substrate by providing an external barrier, preventing water ingress and coating the surface in an inhibiting oil which prevents the flow of oxygen and the electron transfer that is essential to the corrosion process. This isolation process works for galvanic, pitting and crevice corrosion as well as normal atmospheric corrosion.

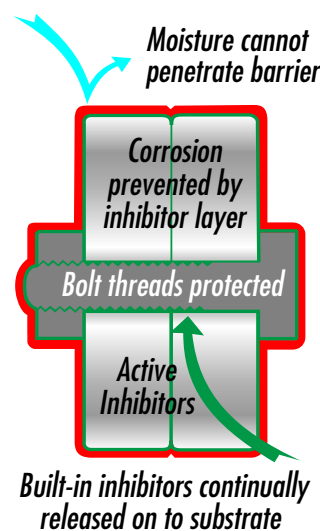
The Enviropeel system uses a corrosion-inhibiting, sprayable thermoplastic to provide a close-fitting active barrier coating on steel substrates of any size or shape with minimal surface preparation.

### FLEXIBLE & ADAPTABLE

Not only is the Enviropeel material flexible, allowing it to expand and flex with movements in the substrate but the system itself is very flexible in use, allowing a wide variety of solutions on a range of problem substrates. Whether it is being used to protect bolts, flanges, valves or pipe supports, it provides supremely adaptable protection, allowing encapsulation of almost any configuration.



Above: after two years, an application on a flange with severely corroded bolts is cut away for inspection. No further corrosion has taken place and inhibiting oil can be seen on the fastening and in the removed Enviropeel coating.



Above: Enviropeel is available in a variety of colours and is suitable for a variety of substrates: pipe supports, flanges, valves, elbows and brackets etc.

Left: a simple schematic to show how Enviropeel protects. In red, the outer encapsulation prevents ingress of moisture and, in green, the constant release of inhibitors coats all inner surfaces, isolating components from corrosion.

### WASTE-FREE, RECYCLABLE AND NON-TOXIC

While it is not part of a specific safety regime to reduce the environmental impact of materials, it is worthwhile noting that Enviropeel does fulfill this objective. The material itself can be reused or recycled – waste material can immediately be used in the application unit – and no special disposal measures are required as the material is non-toxic and contains no VOCs.



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