

Fully protected

The offshore wind energy industry has seen enormous growth in recent years and it doesn't look to be slowing down anytime soon. Those in the industry will know the stats: the offshore wind energy market is forecast to reach \$42bn by 2025, growing at a CAGR of 13.6% from 2020 to 2025.

The focus for clean, renewable energy is growing worldwide, evidenced by President Biden who in January signed an Executive Order that includes doubling offshore wind power generation in U.S federal waters by 2030. In October last year the UK Government, already home to the largest offshore wind market in the world, announced a £160m injection into the industry to upgrade ports and infrastructure.

Vietnam has big plans to increase its proportion of power from wind and solar from 10% in 2019 to 42% of the national grid by 2045. Although most current locations are onshore, they are already making great strides to achieve that goal ahead of schedule, with their next big push in offshore wind off their southern coast.

Renewable energy is a global cause, a skim through renewable news sites reveals new projects being commissioned on an almost weekly basis and with that progress comes the need for preventative maintenance and protection.

The push for offshore wind takes advantage of the power of the wind produced at sea, moving at a much higher and more consistent speed thanks to the open space and absence of structures. What is a benefit to production however, poses a logistical disadvantage to construction and maintenance along with an aggressive corrosive environment?

Whilst currently situated near the shore in predominantly shallow waters where possible, the next few years will see a move to deep water installations further away from the coast, as space becomes an issue.

These developments will see stronger winds and bigger waves adding pressure to not just the installation phase but ongoing operation and maintenance.

We all know that corrosion costs money, time and disruption. Without action to counteract it, the result will be product, maintenance and safety issues.

Corrosion creeping into the monopiles, ladders, walkways, boat landings, guard rails and rotor heads – the many areas of a wind turbine that will likely be affected.

So, what if we had the answer?

What if there was an easily applied, simple fix for when a corrosion spot arises. Something that did not require extensive equipment, could easily be transported offshore and didn't require extensive training. Something

that could get into the 'hard to reach' places such as of rotor shaft heads or boat landings?

The benefits here would mean less maintenance time, long term protection, time back to the operators, reduced costs allowing reallocation of budget for further development, a positive impact to production.

Consider 2 scenarios: a corrosion spot is identified

Scenario 1

Materials and equipment need to be brought to the nacelle to work on a rotor shaft or blade. This includes surface preparation tools, coating and application tools as well as rope access equipment.

Where extensive surface preparation equipment is required, you can add in paints, brushes, PPE including safety masks etc. Once the job is complete all equipment must still be transported back down. Most of this equipment is treated as chemical waste and must be segregated and disposed of as per local environmental regulations.

Scenario 2

A small team, one person is armed with a wire brush and a roll of patches. They simply brush the loose corrosion away, apply the patch and

are done. The applicator returns with only the release liner and cardboard as waste.

The operator never has to reach the point of blasting, creating a roughness, removal of chlorides and painting the towers until the end of their design life, which depending on time in-situ could be up to 25-30 years. Every corrosion spot halted from expansion at start.

Which scenario sounds best?

The subject of surface preparation is always an interesting one when it comes to corrosion. Blasting is messy; work areas need to be protected, waste must be contained and disposed of, the by products can be hazardous and it takes time.

It is a key step in any corrosion prevention coating, but if it can be simple – such as a wire brush, resistance to chloride contamination, that is a huge advantage to operational maintenance time. Even better if it's a simple abrasive pad followed by an isopropanol wipe.

Ease, speed and repeatability are key

Easy-Qote is a polymeric coating born of the idea that a corrosion solution could be applied simply as a sticker rather than painting or spraying. The product is 100% safe for both user and the environment and simple to apply.



Close up patch replacement



ICCP flanges close up



Offshore coating repair basecoat and self-cleaning patch

Case Study 1: Sealing of a transition piece

Any void or exposed groove on an offshore structure is a vulnerable spot for crevice corrosion that may affect the integrity of the structure. Transition pieces are one of the examples, close to the sea and with high chloride content accumulation, is prone to accelerated corrosion and integrity. Applying our self-adhesive corrosion preventative Easy-Qote SC Patches over the groove, sealing it off from the environment we prevent corrosion formation from the start, yet due to the Visco-Elastic behaviour of the solution, withstanding expansion and contraction of the steel without cracking or loss of adhesion. Same goes for any other space or connection point on the structures.

Case Study 2: Flanged structure connections

Flanged spots not only have the voids that accumulate unfavourable environment for the protection of the asset but also expose a lot of sharp angles, like bolts and nuts, prone to damage during installation as well as service life of the structure. By encapsulating the flange using Easy-Qote paste, basecoat and an addition of extra mechanical protection layer such as composite wraps, we not only prevent corrosion but increase the mechanical properties of what would otherwise be considered a weak spot.

A post-Covid-19 world

No one could have imagined how 2020 unfolded, a pandemic sweeping the globe, many countries in recession, budgets being hit harder than ever. Oil prices dropped, projects put on hold, struggles with supply chains, workforce constraints with social distancing measures, turnaround projects pushed back with just a focus on the critical work required and regional lockdowns that halt almost everything locally.

The impact on maintenance and asset integrity is profound, Maintenance Managers now face a whole new set of challenges to balance, on an already sensitive set of scales.

Deployment of personnel has, and will likely continue, to be a challenge for 2021. Not only with the risk of an outbreak amongst staff, but with the need to provide a safe environment with social distancing measures and PPE equipment while vaccines are rolled out. This has resulted in smaller workforces in operation at any one time and careful deployment to where manpower is needed most, delaying operational and maintenance activities.

Lockdowns across the globe have led to a halt in production for many businesses in the supply chain. They not only face catching up on work lost but the added constraints of the new workplace safety measures. Reductions

in workforce allowed in at any one time to comply with these measures will likely slow further production.

Constraints on travel across the globe pose problems for the movement of personnel to get to project destinations whether it be inspection or maintenance activities. Quarantine times and isolation windows could well extend the time people are travelling, and of course whether countries have agreed air bridges to enable the reciprocal flow of passengers.

But whilst industry faces constraints to operational maintenance there is one universal truth – it still needs to be done.

This is where minimal footprint solutions become a huge advantage. Not only do they make for ease of application, they require the least amount of personnel to complete the work. We have already discussed the optimal scenario for completing the job to bring the most benefits to the work environment, but view that in our current world and the benefits speak volumes.

Offering coating solutions

Seal For Life also offers a thermoplastic coating solution in Oxifree TM198. Oxifree has experience in the Wind Sector bringing its encapsulation without adhesion benefits to the challenging environment Wind Turbines operate in. There are many

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situations that require the ability to remove the protective coating for maintenance, e.g. structural bolting, or repair or simply for moving parts. Take for instance a working catlink, hydraulic fitting or actuator – they would all be able to move within the coating and maintain normal operational use which is a huge benefit for operators.

And the preparation is minimal, a wire brush

is enough to clean the area, no blasting required. In addition, the environment does not need to be perfect, humidity or cold do not affect application.

A major benefit is the ability to protect without a shut down, keeping costs down and the industry moving as well as the ease of inspection via NDT or simply remove in part, inspect and refill.

What happens next?

The world is embracing wind technology, it’s clear to see, and it is now the job of coating companies to move with these times and offer the vital protection they need.

Seal For Life is primed and ready to do just that.

 www.sealforlife.com

