National Marine Pest Biosecurity Review Submission

By R. Voysey – Director **8th November 2014**

Smart Surfaces marine P/L

Introduction:

Having only been introduced to this submission opportunity via the ASRG (Australian Shipbuilding and Repair Group) recently, this submission is brief we welcome further contact to expand this discussion.

While the need for Biosecurity has never been greater, there are number of great innovation on the market that should be looked at in this context.

Detail:

Smart Surfaces Marine proudly represents a new and innovative product, patented by the US Navy and commercialise by Fuji Film Hunt Smart Surfaces USA (A subsidiary of Fuji Film Japan)

Smart Surfaces have developed a Silicone based coating for the marine industry called Duplex, that offers the following attributes:

- 100% non toxic to the environment
- U**p to 10% increase boat speed** just via the coatings low drag co-efficient. (compared to standard copper ablative)
- Commercial vessel's guaranteed **fuel consumption reductions of 3%**(against copper ablative) with **actual documented reductions of up to 10%.**
- **Manufacture's Coating Guarantee of 5 years** for commercial vessels(for the integrity of the coat), with a single re-coating extending the life cycle to 10 years.
- **US Navy patent,** manufactured by Fuji Film Hunt Smart Surfaces USA.
- Superior Adhesion and abrasion strength via patented co-valent bonding.
- Repairable.
- Will not de-laminate up to speeds of 45 knots.
- **Significant reduction in Green House Gas emissions footprint for vessels**.

This substantial features list means that Duplex should be a major consideration for any forward thinking review of the nation's bio security.

Technical background:

It has been known for many years that Silicone is one of the most "Hydrophobic" materials known to date. This characteristic of repelling water, offers all the benefits of low drag to a vessel surface and minimises turbulence layers at the hull surface.

Not only will the ship use less fuel at a particular speed but it will also travel through the water with more efficiency.(arrive sooner or use less fuel arriving at the same time)

Silicone as a protective coating against fouling, offers 2 major benefits:

1. That most hard fouling animals – like mussels, barnacles, tub worm have difficulty even attaching to silicone.
2. The marine growth that can attach while there is no water movement, are brushed off when the vessel reaches a release speed – that is the water flow is too fast for the marine growth to stay attached.

While in the past, these "release speeds" needed to be in the vicinity of 15 knots – a speed not suitable to large ocean going commercial vessels; We are glad to be able to offer that **the release speed of Duplex is now as low as 8 knots.**

This means that we have a coating solution that offers effective fouling release capability and normal ocean cruising knots.

The implications of legislating to promote Silicone based Fouling release products will have a huge effect to reduce the transportation of non-native bio-growth across the planet.

Implementation costs:

Life cycle:

The application of Duplex Silicone Fouling release is no more complex than a normal strip back and hull recoating.

The great advantage of Duplex is that it comes with a manufactures warranty of 5 years. An additional single recoating after 5 years will give it another 5 year life cycle. In total, a 10 year coating life cycle before having to strip back and start again.

The other great benefit of silicone is that, on removal, it contains no toxic compounds – sand blasting residue can be safely sent to land fill or filtered for re-use.

Application:

From a bare hull surface, Duplex requires two 150 micron (Dry Film Thickness) Epoxy primer coatings. This is then followed by the Duplex tie coat and Duplex Surface coat. Both these coats are also applied to 150 micron DFT, so the final total coating represents 600 microns.

Silicone is lighter than conventional anti-foul, so there is specific weight benefit for vessels where loading is critical.

Material and application costs:

While Duplex is more expensive than standard Copper Oxide (ablative) anti- fouling paint, the initial labour and yard costs are similar, so in total initial application costs in total are approximately double that of a conventional anti-foul process.

Over 5 years, the costs saving on re-coating; yard slippage etc., effectively offer a solution that is **significantly cheaper** than standard anti-foul.

Developments in mechanical cleaning

The development of systems to mechanically clean vessel hulls while in the water are now reaching commercial reality.

For example, in Western Australia, the company Franmarine has developed the Envocart. See: http://www.gageroadsdiving.com.au/projects/envirocart/

While this device has been engineered to clean hulls with metal oxide based anti-fouling paint – that cannot be released into the water because of its high toxicity to the localised marine life; The advantage of combining mechanical cleaning with a silicone paint, is that **there is no toxicity in the paint that needs to be kept from the water**.

Cleaning a Duplex silicone surface is much easier than a standard anti-foul paint that has broken down and has allowed hard fouling to attach to the vessel hull.

Mechanical Robotic hull cleaners engineered for silicone coatings , could be lighter smaller and faster. They could simply release the bio growth back into the native water prior to the ships departure.

Bio-Security Vision

Combining the process of light robotic cleaning of a silicon Duplex hull PRIOR to a ships departure for an oversees destination, would effectively virtually eliminate the transmission of foreign Bio-growth.

This process could be carried out as a ship is loading. In reality if a ship is cleaned prior to departure, the water coming off the hull would only contain local bio-growth and could be simply discharged into the surrounding water.

Cost to shipping would be amortised against their savings in longterm maintenance, slippage etc.

Delays to sailing would not be an issue as Duplex offers better speed and efficiencies – our vessels are already turning up to their destinations days early due to the benefits of Duplex.

Conclusion

The technology is here, now to virtually eliminate trans-ocean bio-contamination. Toxic free Duplex silicone fouling release offers benefits to all, as the most environmentally sound anti-fouling solution for vessels.

It offers long term cost savings to vessel owners and contributes to reducing vessels green house gas footprints.

Along with "in water" mechanical cleaning, a vessel coated in Duplex silicone, can leave port free of fouling to sail to its destination with an accreditation to ensure that it arriving in a clean state.

(repeating)

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Supporting literature:
Motor Yacht speed trials: https://www.youtube.com/watch?v=8sh8erFQiGo
Mineral Noble: http://youtu.be/oQYFGJJxQT8
Attachments:
Abbracci Yacht – hull photos 3 years old – looking in good condition
Abbracci Yacht – the Superyacht Report (2012) – vessel report on performance and savings
Crowley Tug boat after 5 years in service
Fuji Film Duplex Product brochure.
Duplex and the Environment brochure.