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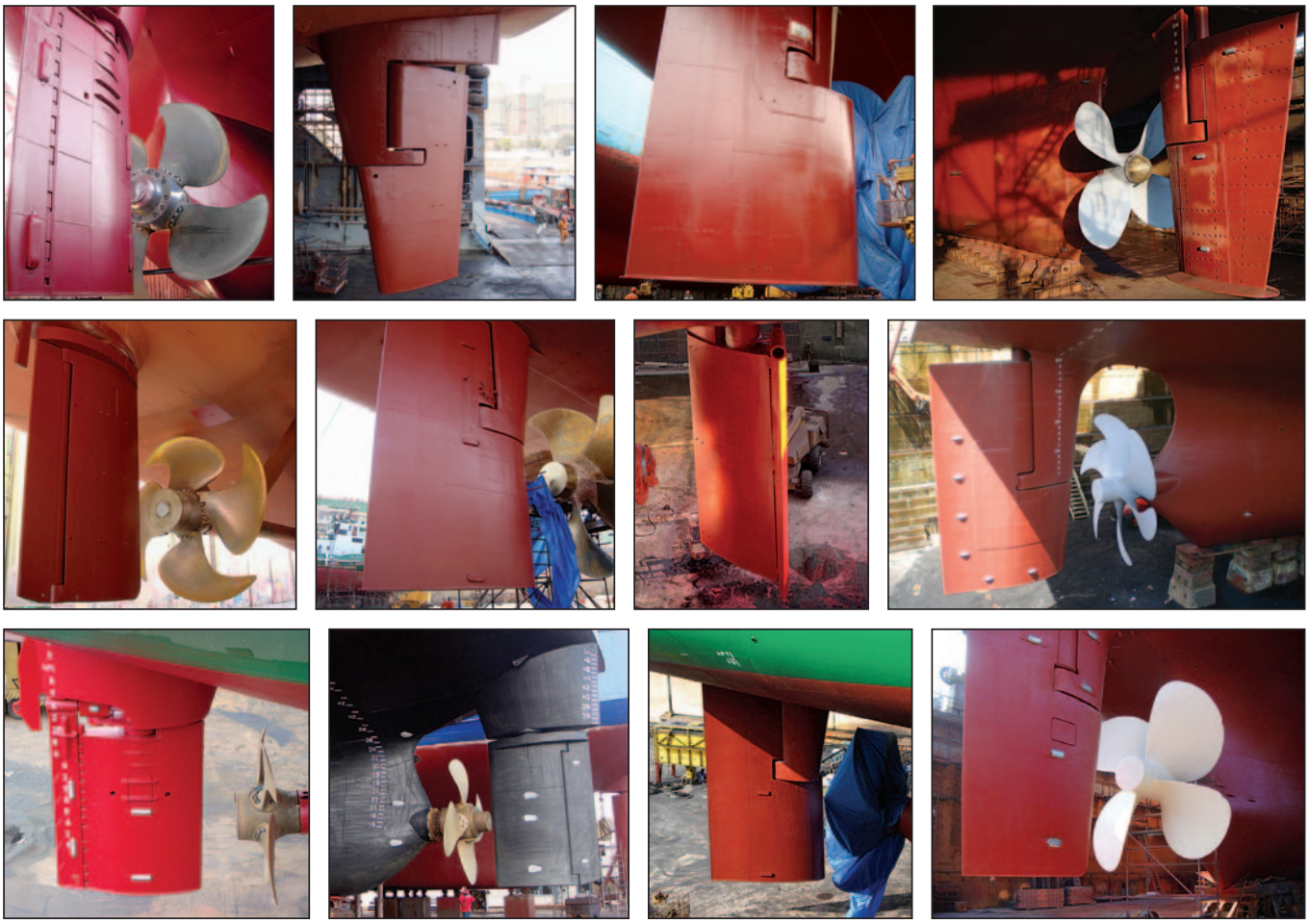
NEWS
LETTER / 279

SeaLaunch *Odyssey* – Protecting the hull of a semisubmersible rocket launch platform

SAY GOODBYE TO CAVITATION DAMAGE



Ecoshield gives a very thorough and lasting defense against cavitation and corrosion damage for a ship hull's entire service life.

The coating equally provides the rudder with an impenetrable protective layer while its flexibility enables absorption of the forces that are produced by cavitation. This prevents the damage normally caused by this phenomenon.

Without proper protection against cavitation and the resulting erosion and corrosion damage, the financial consequences can be severe.

By removing the existing paint layers and applying Ecoshield on the rudder we can break the never ending cycle of painting, suffering damage, having to perform extensive repairs in drydock followed by a full repainting, again and again.

With an Ecoshield application no full repaint will be needed during drydocking. Ecoshield is guaranteed for ten years. At the most, minor touch-ups will be required.

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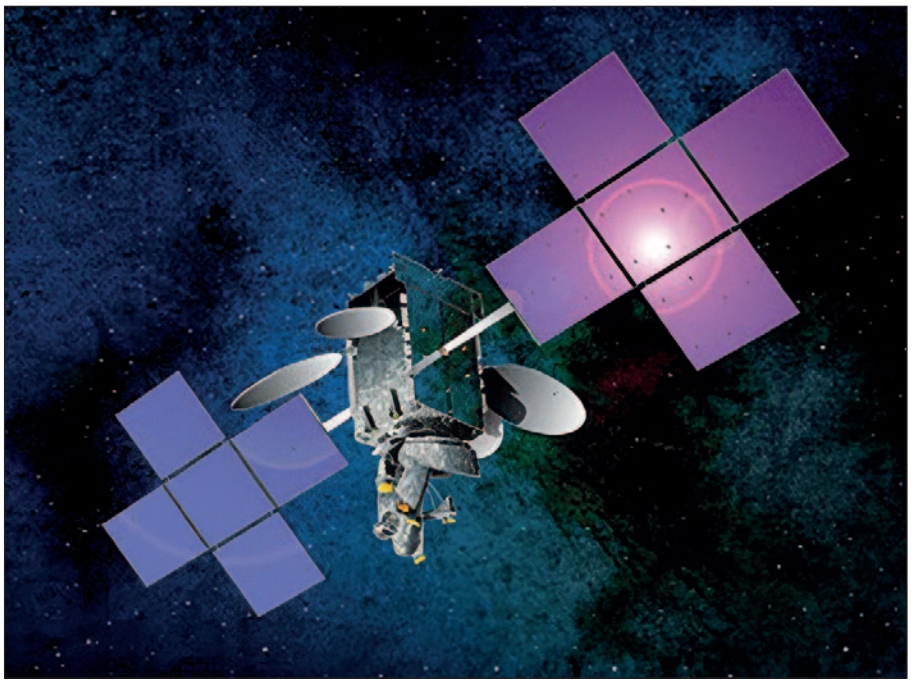
ULTIMATE PROTECTION

SeaLaunch *Odyssey* – Protecting the hull of a semisubmersible rocket launch platform

How do you protect the hull of one of the world's largest semisubmersible vessels, in this case LP *Odyssey*, a rocket launch platform, while accommodating the ship's 15 year drydocking interval? How do you keep the hull free of fouling for the 15-years period and prevent fouling organisms from penetrating the hull coating down to the steel? down to the steel?



Intelsat 19 geostationary communications satellite operated by Intelsat, successfully

These were all questions taken into consideration when the biocidal antifouling system that had been used for 15 years was replaced in 2012 with a glass platelet reinforced inert, non-toxic coating: Ecolock.

There were several reasons that prompted this change. This article explains these reasons and the results. They are particularly relevant to offshore oil and gas industry vessels where protecting the hull for long periods without drydocking are a major consideration in choosing hull coating systems.

Sea Launch LP Odyssey *in action, launching a spacecraft from its position on the equator in the middle of the Pacific Ocean.*

Launch Platform *Odyssey*

At 137 meters (450 feet) long, about 67 meters (220 feet) wide, with a transit displacement of over 27,400 tons, and a submerged draft displacement of 50,600 tons, the Launch Platform *Odyssey* is one of world's largest semi-submersible, self-propelled vessels.

The usual way to place a spacecraft such as a communications satellite, into orbit is to contract the services of a spacecraft launch company. These services include providing and deploying the launch vehicle, and the design of the flight path. When it was still in service, the Odyssey was used to transport and launch the Integrated Launch Vehicle.

*Sea Launch LP O*dyssey *in Long Beach, California.*

Sea Launch LP Odyssey *under way.*

Choosing the right hull coating

Jan Bakke, Senior Superintendent for the vessel explained the unique problems of keeping it in class (and out of drydock). Drydocking the platform was a major, time-consuming undertaking which cut across the vessel's launch schedule. It was very expensive not only in terms of drydocking fees but also particularly from the point of view of time out of service. The vessel earned its keep by launching rockets, preferably six per year. Each launch was a $100-200 million contract. Taking the vessel out of service for months to drydock represented a considerable loss.

"We are authorized by class to drydock the *Odyssey* every 15 years," explained Jan. "The platform has propulsion systems that must be inspected every five years, but we have designed special cofferdams so that the rudders and propulsion systems can be inspected without drydocking the vessel. Using the cofferdams they can do a proper inspection and repair whatever they need to and even extract the propeller shafts if necessary."

The use of the cofferdams made a 15-year drydocking interval possible and acceptable to class. But that left as a major challenge to achieving the 15-year drydocking interval the protection of the hull and the control of biofouling.

The biocidal antifouling coating system which was used until the hull was recoated in early 2012 did not provide the necessary anticorrosive protection. It was not designed to last ten years, let alone the 15 years required to keep the *Odyssey* out of drydock for that length of time.

"This vessel travels slowly," Jan Bakke explained. "We all know first of all that antifouling on this type of slow moving vessel doesn't have the ablative properties needed to prevent fouling, so whether you have biocidal antifouling or a hard coating you will get sea growth." With the soft, antifouling coating system, the biofouling is harder to remove, and it will eventually penetrate the coating.

"We were also looking for an environmentally friendly coating," Jan Bakke added. "This is important to our company."

As far as pricing was concerned, Jan Bakke compared costs and found that the most expensive antifouling coating was more expensive than Ecolock on per liter basis, but Ecolock would be applied no more than once in 15 years whereas the AF coating would have to be replaced after five years at best.

Application

The coating application was carried out while the LP *Odyssey* was in drydock in Malaysia, undocking at the end of February 2012 after considerable work in drydock which included grit blasting the hull completely and recoating with Ecolock, two coats, to a DFT of 1000 µm. The work included changing propellers and kort nozzles and other steel work.

The Odyssey*'s hull before grit blasting and recoating in 2012.*

"The application went very well," said Jan Bakke. He was particularly pleased with the help and expertise provided by the paint inspector who was there throughout the preparation and application to ensure that the coating was standardly applied. Unlike most repainting in drydock which can be a major headache and interfere with other jobs being carried out, the Ecolock application was smooth and was completed per schedule.

"Despite challenges from the weather, it's very good and came out very nicely," said Jan.

Results

The LP *Odyssey* had completed a number of missions since it came out of drydock at the end of February 2012 and had also spent fairly long periods at the home port of Long Beach when Jan Bakke decided to have the hull inspected and cleaned. As expected, the hull accumulated considerable biofouling.

"The cleaning went well," said Jan Bakke. "The fouling was quite thick and sitting solidly on the hull." He noticed a lessening in the fouling after the *Odyssey* was cleaned and returned from another mission. Routine cleaning, since it makes the hull a little smoother each time, makes it harder for fouling to attach, thus reducing the amount of cleaning required.

"The main reason we chose Ecolock for the hull was to avoid the penetration through the paint by the fouling and to protect the hull," said Jan Bakke. "I saw that it's not penetrating. It looks good."

Conclusion

The LP *Odyssey* is a unique vessel. However, as Jan Bakke pointed

The Odyssey*'s hull after grit blasting and recoating.*

The Odyssey's hull before and after underwater cleaning.

Sea Launch LP Odyssey*, launching a spacecraft during the night.*

out, similar requirements exist for all the platforms and other vessels employed in the oil and gas industry. They are subject to hull corrosion, and a great deal of refit work has to be done that takes them out of production. In fact, there was a jack-up rig sitting in drydock ahead of the *Odyssey* when the hull was re-coated. "They could certainly have used Ecolock there, when you look at how much steel they had to change due to a poorly protected hull. What they do is just put a lot of anodes on and sit there and then they have to go into drydock and change a lot of steel, instead of putting Ecolock on the hull to begin with."

The recoating of the *Odyssey* meant that the anodes for the hull protection were no longer needed. "We just use them for the seawater inlets for protection of the piping system internally and for the propeller tips," explained Jan. "So all these jack-up rigs can get rid of all their anodes and all the rest of it and put this coating on. This jack-up rig had been in the dock for six or seven months changing steel. That's a lot of money. If you could put this system on those that would be a big benefit."

After the Ecolock application the *Odyssey*'s hull was securely protected for at least the next 15 years. Since 2020 the launch platform is decommissioned and its future is uncertain, but the Ecolock coating remained intact and able to protect the vessel for years to come. ■

Corrosion damage very repair made ✓easy

Subsea Industries has a product for filling and building up a corroded and pitted steel surface to its original form prior to recoating with Ecoshield. Ecofix is as tough as the steel itself, machinable, and can be used to repair most pitting or corrosion damage on rudders, stabilizer fins, thrusters and other underwater gear.

Ecofix is used in combination with Ecoshield, the ultimate rudder protection coating. When a rudder or other piece of underwater ship gear has not been properly protected, the surface will become corroded.

Cavitation can cause severe pitting. The steel needs to be restored to its original shape with a smooth surface prior to recoating.

This is where Ecofix comes in. It is a superior, tested and proven filler. Because it uses the same basic resin as Ecoshield, the coating can be applied just one hour after the filler. The bonding and hardness are extraordinary. This is the effective alternative to very expensive fillers. And because it is part of the Ecospeed/Ecoshield family, it is fully compatible with our coatings.

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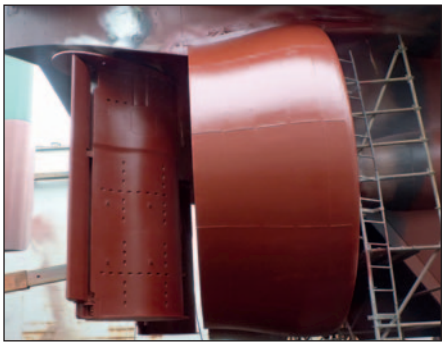

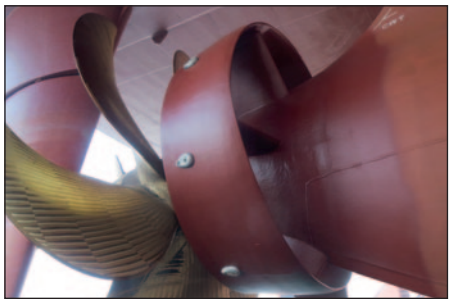

Subsea Industries NV, was founded in 1983 specifically to take care of the design, development and marketing of what has become an evolving line of underwater hull and propeller cleaning equipment as well as the line of hard hull coating systems.

All products produced by Subsea Industries have the same goal in mind: To keep the underwater part of your vessel in the best possible condition for its entire lifetime at the best possible performance.

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