SUBSEA

PROTECTION AND PERFORMANCE

Magazine 284

ECOLOCK® ultra long-lasting protection for offshore hulls

Ecolock is designed to protect offshore vessels for decades without the need for drydocking. Increasingly, offshore units such as FPSOs, FSOs, FLRSUs and others used for offshore oil and gas exploration, drilling, storage and transport need to stay out of drydock for 15, 25 even 40 years.

The challenge has been to protect the underwater hull from corrosion and to provide a cleanable surface so that the biofouling that accumulates can be removed successfully and safely for UWILD and to reduce weight. Ecolock is the answer to that challenge.

Ecolock is an extremely tough and durable coating designed to remain in excellent condition for 15 - 25 years without drydocking, repair or replacement. Ecolock can be cleaned underwater as often as needed to meet the UWILD and weight requirements of FPSOs, drill ships and other offshore vessels. Ecolock is the result of continual R&D on offshore hull coatings since the 1990s.

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ECOLOCK®
LIFETIME CORROSION PROTECTION

Editorial

For too long, the shipping industry has accepted certain problems as unavoidable costs of operating a vessel. Hull friction, corrosion, cavitation erosion, fouling and repeated drydock maintenance have traditionally been treated as separate challenges requiring separate solutions. But what if these problems can be addressed through one fundamental change: protecting the underwater hull efficiently for the lifetime of the vessel?

A smooth, durable hull surface has consequences far beyond appearance. Maintaining optimal surface characteristics reduces friction and can deliver fuel savings in the range of 20–40% over a ship's lifetime. Unlike conventional antifouling coatings that gradually deteriorate, a hard coating that maintains its characteristics and can be cleaned in or out of the water without harm to the coating or the environment allows vessel performance to remain consistent for years.

Long-term protection also changes the economics of maintenance. Corrosion and cavitation can cause severe damage and lead to expensive repairs and lost drydock time. With permanent protection, these risks can be virtually eliminated. Our experience with well over 1,000 protected rudders over a 20-year period demonstrates just how significant this shift can be.

The environmental benefits deserve equal attention. Around one million tons of antifouling chemicals and heavy metals are used and released into the sea every year. Eliminating repeated antifouling applications can therefore reduce toxic emissions, while regular underwater cleaning prevents heavy fouling from developing and helps limit the transfer of invasive species.

There are practical advantages as well. When full recoating is no longer required, drydock work can be more than halved and schedules become more predictable. Newbuilding can require fewer man-hours.

The advantages begin even before a vessel enters service. During newbuilding, our durable homogeneous coatings can significantly reduce repair work and save thousands of man-hours.

After construction, simple underwater cleaning can replace coating reapplication before speed trials, reducing both costs and delays.

The same technology has also proven effective on many ice-going vessels, demonstrating that long-term hull protection can remain reliable even under the severe impact of ice and demanding Polar conditions.

Shipping is under increasing pressure to become cleaner, more efficient and more economical. Achieving those goals does not always require accepting compromises between performance, cost and environmental responsibility. Sometimes the better answer is simply to stop maintaining yesterday's problems and start preventing them altogether.

Subsea Industries NV
Boud Van Rompay
Founder

Ecoshield: Long-term protection where ships need it most

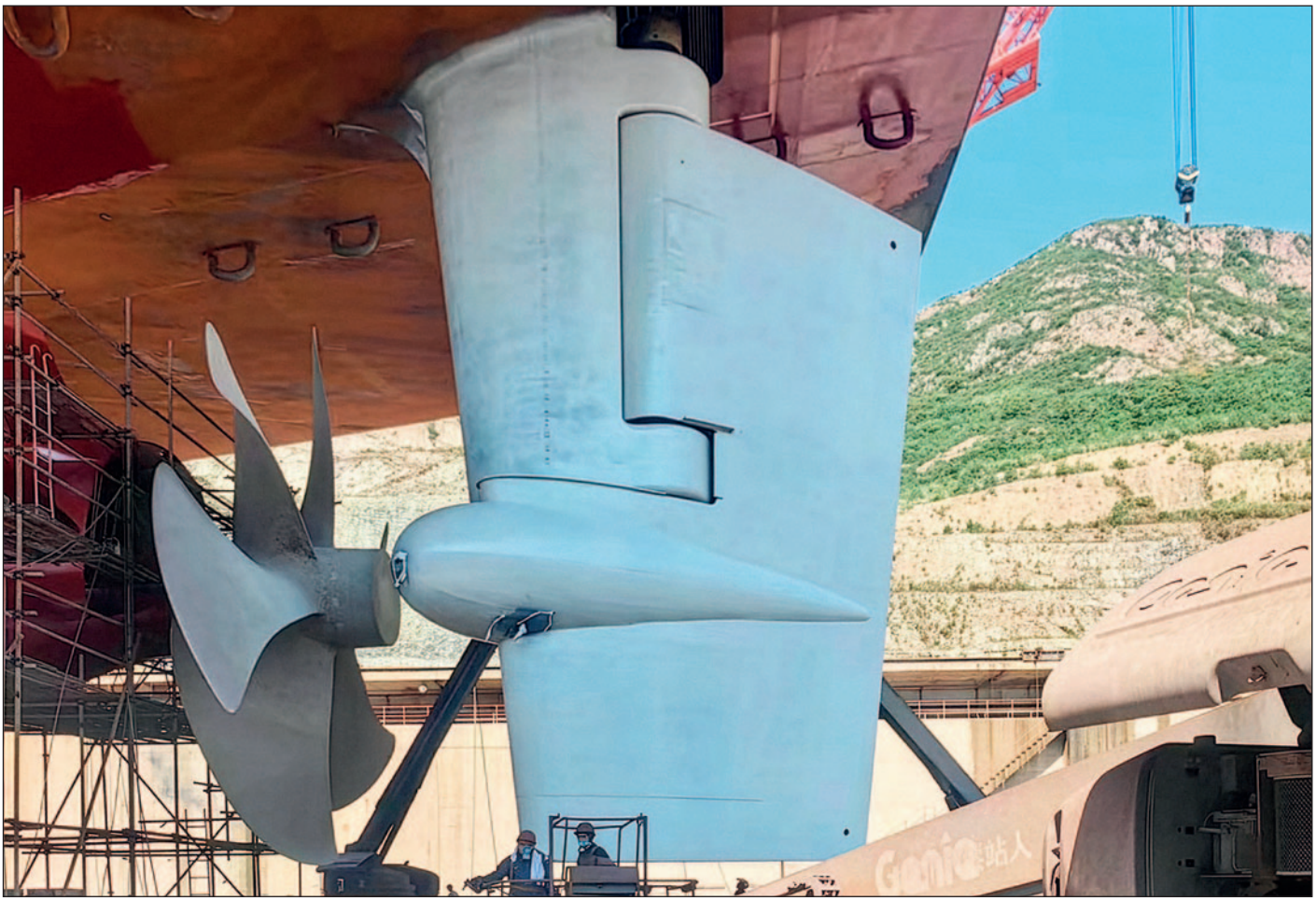
Severe pitting on rudder as a result of cavitation. Ecoshield can prevent this from happening

Rudder after surface preparation, ready for Ecoshield application.

In 2026 Ecoshield has once again proven its versatility in a wide range of maritime applications, protecting critical areas on vessels with very different designs, operating profiles and requirements. From container vessels, passenger ships and bulk carriers to tugs, tankers, naval ships, and oceanographic vessels, the coating has been selected wherever conventional coating systems struggle to provide lasting protection against corrosion, erosion and cavitation.

While Ecoshield is well known for its use on rudders, it has also been successfully applied to bulbous bows, Azipods, nozzles, recycle tanks, scrubbers pipes and outlets,

Ecoshield is applied in only two, identical layers.



Rudder after application of first Ecoshield layer.

energy-saving devices and thruster tunnels.

These underwater components operate in some of the harshest conditions on a vessel. Constant exposure to seawater is only part of the challenge. These areas can also be subjected to severe cavitation, erosion and corrosion, creating damage that conventional coating systems struggle to withstand.

Ecoshield application is scheduled around other work on the vessel without interfering with it.

For shipowners, the consequences are familiar: coating breakdown, steel repairs, repeated surface preparation and repainting during subsequent dockings. Ecoshield was developed to break this cycle by providing a durable protective system specifically for the areas of a vessel that require more than conventional protection.

Protection designed for demanding areas

Ecoshield is an extra-strength, glass-flake-reinforced coating designed to protect rudders and other underwater running gear against cavitation and corrosion. Over the years, well over thousand applications have been carried out worldwide, with major shipping companies extending its use from individual

No repaint will be needed during future dockings.

Ecoshield can be applied at the block stage, prior to installation of a rudder.

test applications to multiple vessels and different underwater components.

That progression is significant. In many cases, owners first selected Ecoshield to solve an existing problem on a single component. After seeing the condition of the protected area at a later inspection or drydocking, they chose to use the coating elsewhere in their fleet.

A different approach to lifecycle maintenance

The value of a protective coating should not be measured only at the moment it is applied. What matters is how well it performs throughout the years that follow.

Recent inspections provide a clear illustration. Two vessels whose rudders were coated with Ecoshield during newbuild in 2019 returned to drydock after approximately six years in operation. The Ecoshield remained intact, with no cavitation damage or corrosion requiring repair. Fouling could simply be removed by high-pressure washing without damaging the coating.

Results like these demonstrate why applying Ecoshield at newbuild can be particularly attractive. Protecting vulnerable components before damage begins avoids starting the familiar cycle of deterioration, repair and repainting. Instead of treating cavitation damage as an unavoidable maintenance item, owners can prevent the problem from developing in the first place.

The same principle applies to vessels already in service. When existing cavitation damage is present, the affected surface can first be rebuilt with Ecofix, Subsea Industries' durable filler system, before

Ecoshield application on energy saving device.

Many customers have reported that they do not need to use cathodic protection on rudders coated with Ecoshield.

Ecoshield is applied. This provides a complete repair and protection solution.

Proven across fleets and applications

Long-term experience is one of the strongest arguments for Ecoshield. Shipping companies have used the coating for many years on rudders and increasingly on thruster tunnels, energy-saving devices and other vulnerable areas.

The range of applications is broad, with recent case studies showing successful use on scrubber outlets, Azipod propulsion units and recycle tanks, because the underlying requirement remains the same: these components need protection capable of surviving conditions that can rapidly damage conventional systems.

Ecoshield also offers a ten-year guarantee, giving owners additional confidence in the durability of the system. Rather than budgeting for repeated coating repairs at every docking, operators can take a

longer-term approach to protecting critical underwater equipment.

Protect once instead of repairing repeatedly

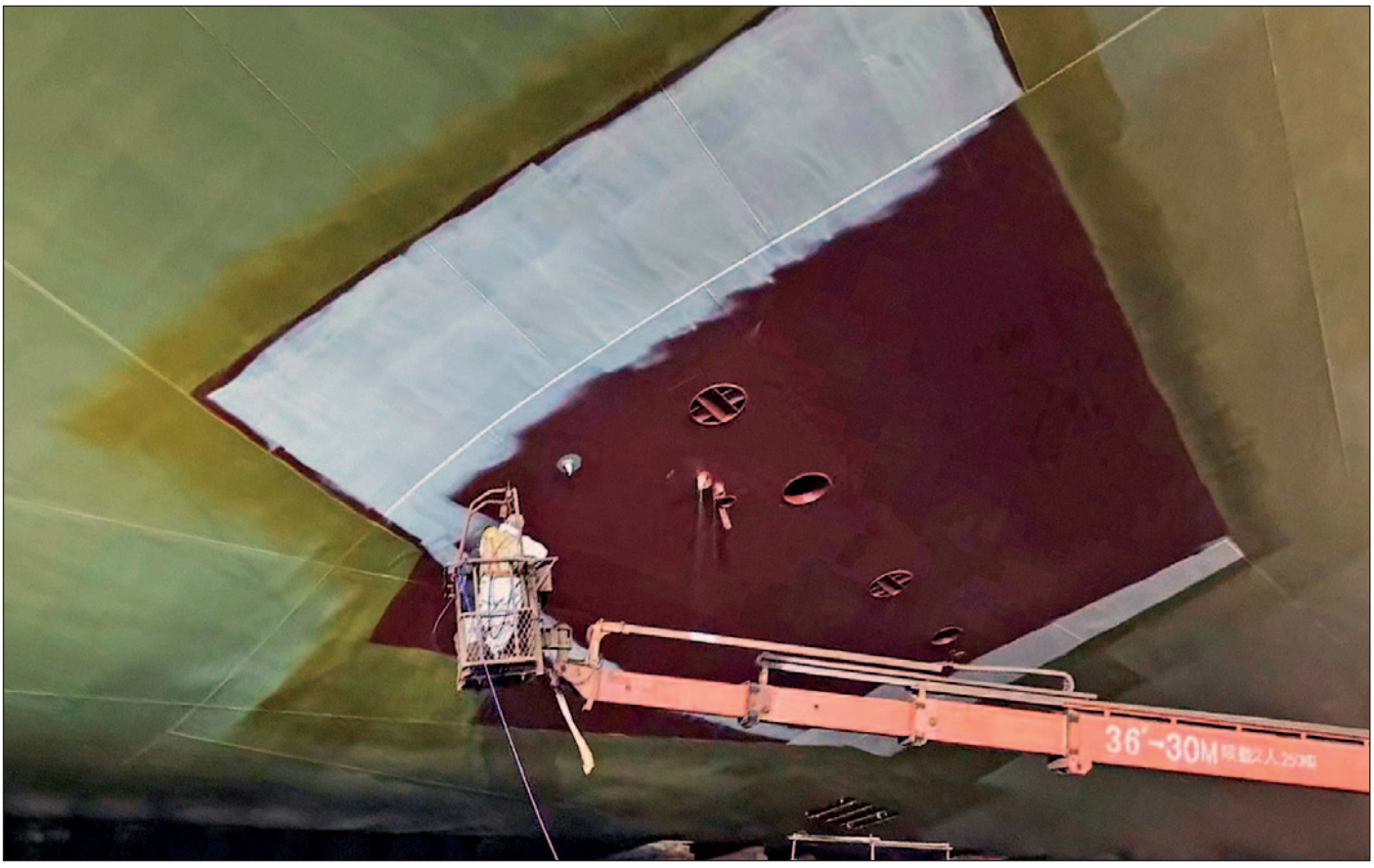
Every drydocking creates pressure to complete inspections, repairs and scheduled maintenance within a limited period. Avoiding unnecessary steel repairs and recoating therefore has benefits beyond the direct cost of paint.

A rudder or thruster tunnel that remains protected requires less intervention, helping simplify the docking scope and reducing the risk of unexpected repair work. Across a fleet, eliminating repeated maintenance on these areas can represent a substantial operational advantage.

Ecoshield changes the question from how often vulnerable running gear will need to be repaired to how that damage can be prevented altogether.

All running gear, such as thrusters and thruster tunnels, can be protected with Ecoshield.

For newbuilds and vessels already in operation, the objective is the same: apply a coating capable of remaining in place and protecting critical components year after year. With a growing track record across vessel types, fleets and underwater applications, Ecoshield provides shipowners with a proven way to achieve exactly that. ■



Application on scrubber overboard area.

Ecospeed coatings certified food-contact safe

The aquaculture industry can benefit greatly from durable, tough coatings that are certified as food contact safe.

Independent testing recently conducted has confirmed what we always suspected to be true: Ecospeed coatings comply with FDA 21 CFR 175.300 safety standards for coatings used on surfaces that contact food. This certification extends the coatings' proven durability and corrosion protection into safe food-contact marine applications.

Independent verification

Compliance testing was performed by Measurlabs using an accredited test method in accordance with FDA 21 CFR 175.300. The coating met and in fact far exceeded the prescribed extractives requirements for both distilled water and heptane. (Test report available on request.)

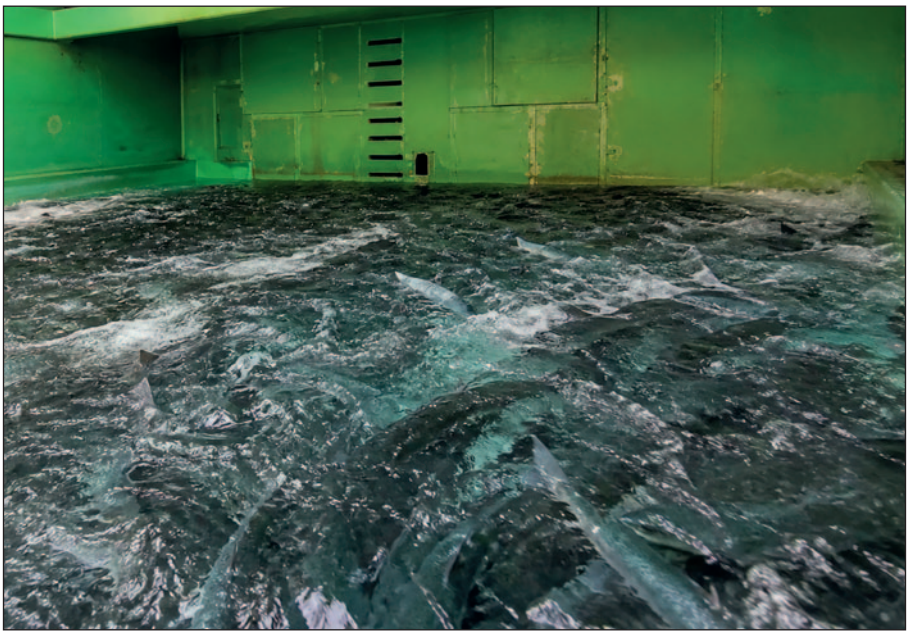
What this means

Ecospeed is a non-toxic vinyl ester coating engineered to provide long-term corrosion protection in aggressive marine immersion service. Its exceptionally hard, smooth surface provides outstanding durability while eliminating the release of biocides associated with conventional anti-fouling coatings.

Food contact safe certification of Ecospeed coatings is of immediate value to the aquaculture industry worldwide.

Because Ecospeed has now been tested and proven compliant with FDA 21 CFR 175.300, this means that these coatings are also suitable for consideration wherever a durable, chemically resistant food-contact coating is required, including:

- Interior surfaces of salmon well boats and other live fish transport vessels
- Aquaculture tanks and holding systems
- Fish processing and handling equipment
- Water-filled tanks associated with food production
- Similar industrial food-contact applications where compliance with FDA 21 CFR 175.300 is specified.



The coating on the hold of well boats is hard to maintain in the required excellent condition. Ecospeed coatings offer a solution.

Ecospeed complies with FDA 21 CFR 175.300 and may therefore be used in water-contact applications where FDA food-contact compliance is required. Applications involving potable drinking water may additionally require NSF/ANSI/CAN 61 certification, depending on local regulations.

In fact we have recently experienced a high demand for this certification, particularly from the aquaculture industry where protection of well-boat tanks carrying live salmon, for example, is a continuing issue. The traditional coatings for these specialized parts of vessels are not tough enough to hold up for long. And the rusty interior of a tank is not an option. The well-boat owners and operators are demanding a longer-lasting solution. Ecospeed glass-platelet reinforced vinyl ester is much tougher than these traditional coatings. But we needed to be able to certify that it conformed with the FDA standard for such use. Now we can.

The oyster cutter YE 48 *has successfully protected its hold with Ecospeed for 19 years without the need to repaint.*

Case study – the Zeeland oyster cutter

Pols-Bom, a certified organic oyster cultivation company operating in Zeeland, in The Netherlands. Founded in 1870, Pols-Bom is based in Yerseke in the southwest of The Netherlands, along with some 15 other oyster farmers. Pols-Bom was one of the first to lease oyster fields in the Eastern Scheldt (Oosterschelde) and in Lake Grevelingen. The trade has been passed down from generation to generation since the company was founded. The knowledge built up within the Pols family over the generations makes it possible for the company to deliver a very superior product today. Mr. Jacques Pols, the current director of Pols-Bom, is the fifth generation to carry on the family tradition.

A key distinction of Pols-Bom is that their oysters are certified 100% organic by Skal who monitor organic products in The Netherlands, from cultivation through processing. The company goes to great lengths not only to ensure that the oysters they bring to market are of the highest quality, but also that they carry out their cultivating and processing activities with maximum care for and minimum impact on the environment.

Key to the Pols-Bom oyster cultivation activities is their oyster cutter, *YE 48 Op Hoop van Zegen* which is used to transport and harvest the oysters. And central to this oyster cutter is the hold where the oysters are deposited and kept. The lower part of the hold is unpainted stainless steel. The upper part of the hold is steel and needs to be protected from corrosion and from the abrasion of tons and tons of oysters with their highly abrasive shells being loaded and unloaded.

Ecospeed stands up to loading and unloading of the abrasive oysters without damage and without any harmful effect on the oysters which are certified organic.

In 2007, Ecospeed was recommended to Mr. Jacques Pols as the ideal coating for the upper part of the *YE 48*'s hold. Ecospeed was applied in two coats to a dry film thickness (DFT) of 1000 µm or 40 mils. The boat has been in constant use since then and the original coating has not needed to be replaced. In 2013 and again in 2022, Mr. Pols ordered very small quantities of Ecospeed to touch up areas where there was some mechanical damage, but otherwise the coating is protecting the steel as well as it was when first applied. It is in extraordinarily good condition, as shown in the photos. "I am a very happy customer," says Mr. Pols.

The 100% non-toxic, food contact safe nature of Ecospeed is essential. The oysters are in contact with the coating on the sides of the hold so that if it had any toxicity, it could negate the 100% organic certification.

The breakthrough in context

For years, non-toxic Ecospeed coatings have been sold and used primarily as:

- A high performance hull coating system
- Protection for icebreakers and ice-going vessels
- Long-term protection of offshore assets (Ecolock)
- High-abrasion service such as decks, dredger hoppers, boottops and bulbous bows
- Rudders, thrusters and other cavitation-prone areas (through Ecoshield)
- Chemical corrosion applications such as crubbers (also Ecoshield)

Now we can add another sector to this list: Aquaculture and food-contact marine applications.

This is particularly significant to the global salmon farming industry which is large and continues to grow.

Operators of salmon well boats and other live fish transport vessels have traditionally had limited choices when selecting long-life protective coatings for fish tanks. In our contacts with aquaculture operators in Chile, for example, the problem with protecting these tanks for an extended period of time came up repeatedly.

So we are very pleased to announce that we can now offer a solution which will solve these problems permanently.

- A coating with a service life measured in decades rather than years.
- Excellent resistance to abrasion from nets, pumps, equipment, and cleaning.
- No biocides.
- Excellent corrosion protection.
- Easy cleaning because of the hard, smooth surface.
- Reduced maintenance and dry-docking.
- Certified food contact safety compliant.

We expect to see Ecospeed coatings widely adopted by those marine industries that have long sought such a solution. ■

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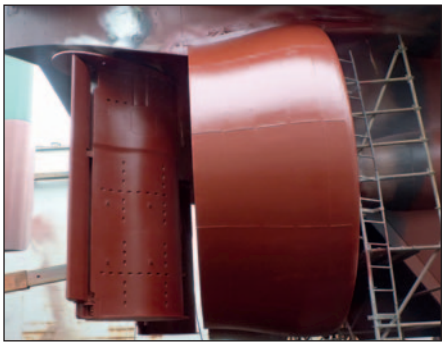

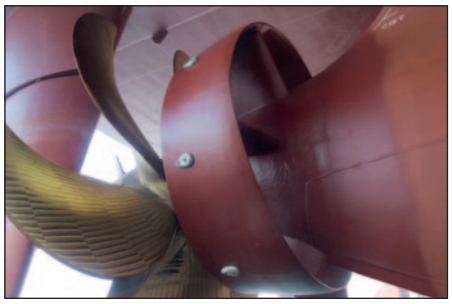

Subsea Industries NV, was founded in 1983 specifically to take care of the design, development and marketing of what has become an evolving line of underwater hull and propeller cleaning equipment as well as the line of hard hull coating systems.

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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